

GZA GeoEnvironmental, Inc.

**FINAL
IPEC QUARTERLY LONG-TERM
GROUNDWATER MONITORING REPORT
QUARTER TWO 2010
(REPORT NO. 10)
INDIAN POINT ENERGY CENTER
BUCHANAN, NEW YORK**

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*Engineers and
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February 15, 2011
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Quarter Two 2010 (Report No. 10)
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Dear Mr. Donahue:

GZA GeoEnvironmental of New York (GZA) is pleased to provide this Quarterly Groundwater Monitoring Report for Indian Point Energy Center located at 450 Broadway, Buchanan, NY.


We trust that this information satisfies your present needs. Should you need any additional information, please do not hesitate to call us at (781) 278-3805.


Very truly yours,

GZA GEOENVIRONMENTAL OF NEW YORK


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1.0 EXECUTIVE SUMMARY

On behalf of Entergy Nuclear Northeast, Inc., GZA GeoEnvironmental of New York (GZA) has completed the Q2 2010 quarterly groundwater monitoring for the Indian Point Energy Center (IPEC), culminating in this report. Interpretations of the monitoring data have been made in the context of the current Conceptual Site Model. Development of this model began at the outset of the site investigations and has been iteratively enhanced as subsequent data has become available, in part through quarterly monitoring. The report has been written with a focus on the most recent quarterly data. Relationships to prior data, more in-depth technical explanations and exceptions to generalized statements and conclusions have typically been relegated to footnotes. This report format was chosen to allow efficient assimilation of the most current data and analyses by those already familiar with the project. The footnotes contain important information and should be carefully read by all, but particularly by those less familiar with the technologies involved and the project history.

Based on the quarterly groundwater sampling data for Q2 2010, GZA concludes that groundwater contaminants continue to migrate toward the Hudson River to the West, and have not migrated off the Site to the North, East or South.

Radionuclide concentrations measured during Q2 2010 were combined with previous quarterly and post-quarterly data to compute rolling average concentrations reflective of groundwater contaminant levels over the past twelve months. These data were multiplied by the associated individual zone-specific groundwater flux values, derived from the Precipitation Mass Balance Model¹, to compute yearly average radionuclide release rates to the Discharge Canal and Hudson River. The Conceptual Site Model² (CSM), upon which this radionuclide dose computation is based, continues to be validated through: (1) groundwater elevation data downloaded quarterly from a focused set of transducer-monitored well installations; and (2) the behavior of both the Unit 1 Strontium plume and the Unit 2 Tritium plume as evaluated each quarter. These data, in our opinion, continue to support the use of the current CSM as a basis for Long Term Monitoring Program design.

The overall Tritium activity in the Unit 2 plume is generally showing a historically decreasing trend, from both qualitative and quantitative perspectives. These overall reductions are seen on **Figure G-17**, where the total Tritium activity has decreased by approximately 28% since Q2 2007, and 86 % when compared to the bounding level Tritium activities, even with inclusion of the current peak in total Tritium (see discussion immediately below). This overall larger trend is also evident on **Figures 6 and 6A**, where the shaded plume³ no longer extends downgradient to the river, as first observed in the Q2 2009 quarterly report. It is further visually evident from

¹ Refer to Appendix H of the Quarter 2 2009 Quarterly Long-Term Groundwater Monitoring Report for discussion of the recalibration of the Precipitation Mass Balance Model. Precipitation and groundwater elevation data were collected onsite between 2007 and 2009 and used to compute groundwater fluxes across the site. Based on analyses of these data, it was concluded that this data set sufficiently encompassed the historical variability in groundwater elevation and flux response to seasonal and yearly precipitation variability. Therefore, maximum onsite groundwater fluxes were calculated from the elevation data, and used to conservatively recalibrate the Precipitation Mass Balance Model, as discussed and employed in the Q2 2009 Quarterly LTM Report.

² The formulation and basis for the overall CSM and the Precipitation Mass Balance model are presented in the Hydrogeologic Site Investigation Report, January 7, 2008, prepared by GZA GeoEnvironmental, Inc. on behalf of Enercon Services, Inc., for Entergy Nuclear Northeast, Indian Point Energy Center, 450 Broadway, Buchanan, NY 10511.

³ The plume shading on **Figure 6** demarks the estimated boundary that separates Tritium levels greater than 5,000 pCi/L from those below this value. This plume delineation boundary value equates to one-quarter of the drinking water standard for Tritium. Although GZA emphasizes that drinking water standards (USEPA MCLs) do not apply to the IPEC property given that there are no drinking water sources on or proximate to the site, the MCLs do provide a useful benchmark for comparisons of relative human risk. Where yearly rolling average radionuclide activity data were available for multiple depths at a given location, GZA used the highest value to develop plume delineations. This is a typical approach to represent three-dimensional contaminant data sets on two-dimensional maps.

Section 1.0 Executive Summary

Figure 6A that the core of the plume has also shown a marked decrease in concentration and extent over time in the vicinity of MW-111. These findings are consistent with our CSM, which anticipates overall decreasing trends in Tritium activity. Consistent with one of the purposes of this Report, we also point out and explain data which, when first considered, may initially appear inconsistent with the assumptions used to develop the CSM. Such examples, where Tritium has increased in recent quarters, include:

- Peaks in Tritium levels have been observed in multiple sampling ports of MW-31 and MW-32 since Q1 2009, and to a lesser extent since monitoring began. This long-term variability appears to be consistent with episodic releases of Tritium historically stored in the subsurface via natural and anthropogenic Retention Mechanisms⁴. This conclusion is further supported by the tracer data and other analyses discussed in Section 3.6 of the Q1 2009 Long Term Monitoring Report.
- While Retention Mechanisms clearly appear to impact Tritium levels as summarized above, the previous Q1 and post Q1 2010 sampling events measured more noticeable increases in Tritium levels in a number of intervals within MW-31 and MW-32, where Tritium activities peaked at levels higher than previously measured. Similarly elevated Tritium activities continued through the current Q2 and post Q2 2010 sampling events at these locations. These Q1 and Q2 2010 Tritium peaks are likely related to a Q4 2009 localized and transient Unit 2 RWST/R.O. processing skid surface spill which was first detected during routine 80-10 sampling of MH-9 in mid-January 2010.
- A number of additional well locations also exhibited peaks in Tritium levels coincident with the RWST/R.O. skid surface spill, as discussed in more detail in **Sections 3.4.4 and 3.4.5** below. In total, approximately 70% of the sampling intervals exhibited an increase in Tritium levels as compared to the previous, Q1 2010 quarter. An increase in the number of Unit 2 Tritium I.L. exceedances was also observed.
- The number and degree of Tritium peaks measured in Q2 2010 has resulted in an increase in the Unit 2 plume total Tritium activity, as shown on **Figure G-17** (Appendix G). As above, this overall increase has also been attributed to the RWST/R.O. skid surface spill.
- Pursuant to the RWST/R.O. surface spill, it is further noted that Tritium activity in MH-9 quickly returned to typical background levels once the spill was addressed. It is therefore anticipated that the Tritium peaks attributed to the RWST/R.O. skid surface spill will also decrease over the next several quarters, and the graph of total Tritium activity in the Unit 2 plume should also then resume its downward trend.
- Our review of data found no evidence that observed increases in Tritium activity were indicative of new, unidentified leaks in the Unit 2 SFP or other monitored Systems, Structures, or Components.

The overall Sr-90 activity within the Unit 1 plume had generally been stable to decreasing in response to the West Pool demineralization operations conducted by Entergy beginning in 2006. However, the final defueling of the Unit 1 SFPs resulted in a noticeable increase in Strontium levels proximate to the SFPs, followed by downgradient increases (see **Figure 7 and 7A**). This is as was predicted given the requirement to temporarily raise the pool levels for fuel rod removal, thus increasing leakage rate from the SFPs⁵. As expected, the levels proximate to the pool have since decreased to pre-defueling Strontium activities and it is expected that levels

⁴ These Retentions Mechanisms are discussed along with the CSM in the previously cited Hydrogeologic Site Investigation Report.

⁵ As of late 2008, all the fuel rods have been removed from the Unit 1 SFPs and the pool water has been drained. As such, the Unit 1 SFPs is no longer an active source of radionuclides to the subsurface.

Section 1.0 Executive Summary

downgradient of the pool, currently exhibiting decreasing trends approaching pre-defueling levels, will also fully return to pre-defueling levels once this transient perturbation has passed through the groundwater flow system. It is anticipated that this flushing mechanism will be protracted given the impact of partitioning on Strontium levels in the groundwater.

Based on the data and analyses provided herein, our conclusion is that the Tritium and Strontium plumes are both undergoing overall long-term reductions in activity. Given this conclusion, and the recognition that Entergy has terminated all identified leaks in the Unit 2 SFP⁶ and has decommissioned the Unit 1 SFPs, these plumes satisfy the requirements for Monitored Natural Attenuation (MNA), the remedial technology selected for the IPEC Site. However, it is also concluded that, while a portion of the leakage from the above cited localized, transient spills traveled directly to the saturated groundwater regime and resulted in the observed transient "peaks" in radionuclide levels, additional portions of these releases likely remain above the water table as recharge to the various Retention Mechanisms. This additional unsaturated zone source recharge will likely be manifested in the future as additional non-specific peaks in radionuclide levels due to episodic releases to the groundwater flow regime from these mechanisms (e.g., from intense/prolonged precipitation events). These localized release events also interfere with the goal of resetting Site Investigation Levels (I.L.s); updating of Strontium I.L.s must therefore await return to the original Strontium baseline levels existing prior to Unit 1 defueling, and additional seasonal data is required to better assess Tritium response to precipitation-driven Retention Mechanism release variability. Therefore, the ultimate confirmation of the above conclusions will require monitoring over a number of years so as to allow ranges in seasonal variation to be adequately reflected in the monitoring data and thus demonstrate continued depletion of Tritium and Strontium from the Retention Mechanisms. In this regard, it is important to recognize that even with the somewhat increased Tritium levels currently observed due to the Unit 2 RWST/R.O. skid transient surface spill, the amount of radionuclides being released through the groundwater pathway is still small compared to permitted levels of Tritium discharge to the river through the Discharge Canal.

In summary, based on the data collected to date, the apparent strength of the CSM to evaluate that data, and the completion of source interdictions by Entergy, we believe all Program Objectives (see **Section 3.0**) are being met. These objectives are consistent with and fully encompass the guidance provided in the NEI Groundwater Protection Initiative (GPI).

⁶ Further justification for this conclusion can be found in Section 3.6 of the Q1 2009 Quarterly Monitoring Report as well as the Hydrogeologic Site Investigation Report. The Q1 2009 Report summarizes additional, more quantitative analyses which were completed to further investigate the integrity of the Unit 2 SFP. These analyses provide further support for the original conclusion that the Unit 2 SFP is no longer leaking. However, given the more recent behavior observed in the Unit 2 collection box data (see Section 3.6 of the Q1 2009 Long Term Monitoring Report), additional investigations/data evaluations are underway to further rule out potential Unit 2 SFP leak mechanisms. In this regard, it is noted that these analyses cannot definitively and completely rule out the possibility of a remaining small leak which could then also be supplying Tritium to the groundwater flow regime in addition to the Retention Mechanism(s) and surface spill from the process skid discussed above. While it is not possible to quantify the size of the minimum detectable leak with any degree of certainty, we believe that the maximum leak rate from the Unit 2 SFP that could potentially remain undetected by the groundwater monitoring system is less than 10 to 30 gpd (0.007 to 0.021 gallons per minute). It is also likely that if a small leak exists in the Unit 2 SFP liner, it should not get worse with time. This opinion is based on liner evaluations previously conducted by Entergy. It is further emphasized that while a leak of more than 0.02 gallons per minute should be large enough to be readily detectable with the existing Long Term Monitoring Program; this amount of Tritium release to the river is still small compared to permitted levels of Tritium discharge to the river through the Discharge Canal.



2.0 SCOPE OF WORK

During Q2 2010, GZA performed groundwater monitoring at IPEC in Buchanan, New York (Site) as part of IPEC's overall Long Term Groundwater Monitoring Program (LTMP) at the Site⁷. The overall foundation for the development and execution of this LTMP is based on the CSM, a description of which is contained within GZA's Hydrogeologic Site Investigation Report⁸. The scope of work completed for this quarter's monitoring is described in the Sections below. Refer to **Figures 1 and 2** for a Site Location Plan and Site Plan. **Figure 3** provides a Lower Hudson Valley Geologic Map and **Figure 4** summarizes Current and Potential Future SSC Source Locations.

2.1 Groundwater Elevation Measurement

GZA maintains a network of long-term monitoring transducers and dataloggers as part of the instrumentation located across the Site. These instruments record groundwater elevation and temperature measurements at regular time intervals⁹, which are then downloaded on a quarterly basis¹⁰. Transducer installation logs are presented in **Appendix B**.

During the quarterly sampling, GZA downloaded groundwater elevation data from the long-term monitoring transducers, which collected data over the entire duration of the quarter. The low-tide groundwater elevation data during Q2 2010 (04/09/2010) from these 22 transducers are presented in **Table 2** and compared to historic minimum and maximum values on **Figure 5A**¹¹. These data demonstrate that substantial variations to the observed flow field have not occurred. These data thus further validate the applicability of the Precipitation Mass Balance Model (PMBM) for use in subsequent radiological dose computations – see **Section 3.1**.

2.2 Groundwater Sampling

During Q2 2010, GZA collected groundwater samples for radionuclide analysis from scheduled sampling intervals within select monitoring installations ("wells") as shown in **Table 3**. Chains of Custody for these samples are presented in **Appendix C**. GZA also collected additional groundwater sample volumes to provide aliquots to the NYDEC this quarter.

⁷ Refer to the "Quarterly Long-Term Groundwater Monitoring Report Q2–Q4 2007 (Report No. 1)," dated May 2008 for Site background information and a description of the environmental setting.

⁸ Hydrogeologic Site Investigation Report, January 7, 2008, prepared by GZA GeoEnvironmental, Inc, on behalf of Enercon Services, Inc., for Entergy Nuclear Northeast, Indian Point Energy Center, 450 Broadway, Buchanan, NY 10511.

⁹ Currently, transducers record groundwater elevation and temperature readings on a 20 minute time interval so as to allow capture of tidal variability. An original, more extensive network of pressure transducers provided critical data inputs for the development of the CSM and the computation of yearly radiological dose to the Hudson River. Over the first nine quarters of the LTM program (Q2 2007 through Q2 2009) sufficient data was collected from this more extensive network of transducers to capture groundwater elevation response to seasonal and yearly precipitation variability. Therefore, starting with the Q3 2009 quarterly report, the transducer monitoring program was refocused on a select subset of locations to routinely monitor the on-Site groundwater conditions going forward. These locations were selected to provide the data required to document that groundwater flow conditions remain consistent with the CSM, thus demonstrating the veracity of the subsequent dose computations. The rationale for the specific locations and depths included in the LTMP transducer redeployment are provided in Appendix K of the Q1 2009 Quarterly Monitoring Report (Report No.5), dated July 2, 2010 and Appendix J of the Q2 2009 Quarterly Monitoring Report (Report No.6).

¹⁰ With regard to these ongoing long term monitoring locations, it is noted that the transducers have a limited life. While some of the transducers can be replaced, and have been replaced in the past, others are permanently installed in the subsurface and are no longer accessible for replacement. However, with time, the base of data upon which model validity is assessed becomes increasingly more robust. Therefore, if some of these transducers fail over time, it is not likely that replacement will be imperative. This is because the likelihood of encountering a precipitation event substantially outside the already captured range becomes increasingly more remote with time as more data are collected. In addition, it is again emphasized that considerable conservatism has been incorporated within the model development and the dose rates computed are still far below those permitted by regulation.

¹¹ Figure 5, which previously presented shallow and deep groundwater contours, can be found in quarterly reports prior to, and including Q2 2009. This figure is no longer required given that sufficient quarterly contour data has already been obtained (See Q2 2009 for further analysis).

Section 2.0 Scope of Work

GZA used a number of different types of pumping equipment depending upon the sampling method and the characteristics of the individual monitoring installation¹². **Table 1** lists the monitoring installations sampled, the sampling depths and elevations within sampling installations, and the sampling method and equipment used.

In general, GZA implemented two basic methods of sampling to collect representative groundwater samples: the Low Flow method and a modified well volume purge method. The Low Flow method allows collection of representative groundwater samples from discrete sampling zones within a monitoring installation, while limiting the accumulation of wastewater¹³. As agreed by Entergy Nuclear Northeast, the NRC, NYSDEC, and GZA, the modified traditional purge method¹⁴ allows for the collection of a representative groundwater sample from a monitoring installation after purging 1.5 volumes of water¹⁵. We implemented this method in wells where low flow sampling was not practical. Sampling Data Sheets summarizing water quality data and sampling information are presented in **Appendix D**.

With all of the above sampling methods, GZA used dedicated sampling equipment, including polyethylene and/or nylon tubing and submersible electric pumps to the extent practical. The use of dedicated sampling equipment limits the possibility of cross-contamination between monitoring installations and/or individual multi-level samples within a single installation. Refer to **Table 1** for a summary of the sampling methods, equipment, frequency, and depths employed during this quarter's groundwater monitoring round.

2.3 Vapor Containment Building Foundation Drain Sampling

GZA collected a water sample from on-Site manholes MH-5, B-1 and B-6 to characterize discharge from foundation drains around and below the Unit 2 and 3 Vapor Containment Structures. These drains include both foundation drains around the building peripheries ("curtain drains") as well as those around the sumps near the middle of the structures ("reactor sump footing drains"¹⁶).¹⁷ The Q2-2010 results for these manholes indicate an increase in Tritium activity at Unit 2 (MH-5) by a factor of two when compared to the previous sampling results (Q1 2010)¹⁸, but a decrease in Tritium levels in B-1 by a factor of approximately two when compared to the previous sampling results (Q1 2010). Cesium was detected at B-1 during Q2 2010 at levels slightly above MDC, but well below the 80-10 Effluents Program reporting limits. All radionuclides (including Tritium) were non-detect at B-6 during the Post-Q2 2010 sampling event.

¹² Refer to Section 4.3 of the Final 2007 Quarterly Long-Term Groundwater Monitoring Report No. 1, dated May 2008, for sampling method and equipment selection rationale.

¹³ As described in: Low-Flow Sample Collection, GZA, 7/18/2007

¹⁴ As described in: Modified Traditional Groundwater Sample Collection, GZA, 7/18/2007

¹⁵ When external factors (such as well-surface-flooding from storm water runoff or overland flow of plant component leaks) might have infiltrated the top of the well and impacted ambient groundwater conditions at a specific sampling location, GZA typically purged three to five volumes of water (using the modified traditional purge method) prior to collection of a sample to attempt to obtain a representative groundwater sample.

¹⁶ We could not verify that a foundation drain exists around the reactor sump in Unit 2. The assumption that it does exist is based on the plans for Unit 3 and the similarities in construction of both units.

¹⁷ These two Unit 2 drains which discharge into MH-5, along with similar drains for Unit 3 which discharge into Manholes B-1 and B-6, form an integral part of the early leak detection monitoring network. However, sampling from these three manholes has generally been problematic for a number of reasons, but particularly due to conflicts with plant security measures which mandate that the manhole covers be permanently welded shut. Some limited access has been reestablished by modifying the manhole covers to allow for a small access opening. However, this modification still limits the ability to routinely collect samples representative of the foundation drain discharges rather than just the total flow through the storm drains. Further work is being undertaken on the manhole sampling systems to facilitate more representative sampling of these foundations drains.

¹⁸ The Q2 2010 Tritium activity at MH-5 is less than both the Q3 2009 and the Q4 2009 Tritium results. MH-9's Tritium activity showed a decreasing trend from Q3 2009 to Q1 2010 in MH-9.

Section 2.0 Scope of Work

2.4 Proactive Mid-Quarter and Confirmatory Sample Collection

In response to the recent peaks in Tritium activity in multiple MW-31 and MW-32 sampling intervals, additional Post-Q2 2010 groundwater samples were collected at all sampling intervals within MW-31 and MW-32 (as well as MW-30).

The results of the confirmatory and mid-quarter samples are presented in **Section 3.4** along with the quarterly data. Sampling Data Sheets summarizing water quality data and sampling information are presented in **Appendix E**.

2.5 Preventative Maintenance

GZA performed general wellhead maintenance tasks, such as housekeeping of well vaults and roadboxes, and replacement of dedicated sampling equipment, tubing and transducers, as required.



3.0 DATA EVALUATION

The Long Term Monitoring Program was designed to provide data to address four main objectives:

- Monitor radionuclide activities and evaluate groundwater flow rate to both detect and characterize current and potential future off-Site groundwater contaminant migration to the Hudson River, both via direct groundwater discharge to the river and through infiltration into the Discharge Canal, from abnormal radionuclide releases of liquid effluents, so as to allow computation of potential radiation dose to the public from these releases;
- Monitor groundwater proximate to Systems, Structures and Components (SSCs) which exhibit a credible probability of resulting in a visually undetected release of radionuclides to the subsurface carrying an activity level of significance;
- Monitor groundwater along the property boundary to confirm that contaminated groundwater is not migrating off of the property to locations other than the river; and
- Monitor the groundwater plumes identified on-Site to demonstrate overall reductions in total activity over time as is consistent with the requirements of Monitored Natural Attenuation (MNA)¹⁹, the selected remediation for the IPEC Site.

These objectives are consistent with and fully encompass the guidance provided in the NEI Groundwater Protection Initiative (GPI). The following sections provide data analyses to address these four objectives.

3.1 Groundwater Mass Flux Computation

As presented in the Hydrogeologic Site Investigation Report, the groundwater flow in both the upper and lower flow zones is toward the power block area from the North, East and South, with subsequent discharge to the Hudson River to the West. We estimate that groundwater flow associated with infiltration from the watershed may be as deep as 350 feet, but still ultimately discharges to the river. A corollary to this conclusion is that there is no groundwater flow, and thus no off-Site radionuclide migration from the power block area to the North, East or South.

To estimate groundwater flow (i.e., groundwater mass flux) beneath the Site, a groundwater flow model was constructed based on a precipitation mass balance analysis. This analysis is based on the precept that, on a long term average, the groundwater flowing through and discharging from the aquifer is equal to the watershed infiltration recharge; this conclusion was reached because the only substantial source of recharge to the aquifer is areal recharge derived from precipitation. The previous fifteen year average for precipitation measured at the Site is approximately 36 inches per year. Based on a USGS infiltration study²⁰, as well as the Precipitation Mass Balance Model (PMBM) calibration²¹, approximately 25 percent of the

¹⁹ The selection of MNA as the remedial strategy for the Site is discussed further in the Hydrogeologic Site Investigation Report.

²⁰ USGS. Water Use, Ground-Water Recharge and Availability, and Quality of Water in the Greenwich Area, Fairfield County, Connecticut and Westchester County, New York, 2000-2002.

²¹ The Precipitation Mass Balance Model (PMBM) was initially calibrated to groundwater fluxes based on a Darcy's Law Model with groundwater gradients derived from Q2 2007 (June 1, 2007) low-tide groundwater elevation contours (initial reference data set). The two models use different sets of input parameters which are not dependent or related to each other. This calibration not only verified the reasonableness of the overall groundwater flow rates predicted by the PMBM, but also allowed further discretization of the groundwater flow into upper and lower flow zones as well as flow volumes upgradient and downgradient of the Discharge Canal. After reviewing the groundwater elevation and precipitation data from the Indian Point meteorological station over the time period from Q2 2007 to Q2 2009, it was concluded that sufficient seasonal data had been collected to encompass the majority of the precipitation variability observed over the last fifteen years. Therefore, the PMBM was also recalibrated after collecting the final full

Section 3.0 Data Evaluation

precipitation falling on pervious surfaces over the Site watershed area recharges the groundwater system via infiltration.

Since precipitation represents the driving variable for groundwater flux in the PMBM²², the yearly precipitation just prior to Q2 2010 (approximately 38 inches) was calculated and input into the recalibrated model to compute the flows used in the estimation of Q2 2010 dose values. Based on the USGS study cited above, the aquifer recharge rate is therefore approximately 10 inches for the year prior to the Q2 2010 monitoring event. Applying this value to the pervious surfaces within the six individual groundwater flow zones shown on **Figure 4**, it is estimated that approximately 5 gpm of groundwater flowed into the Discharge Canal from the upper and lower zones in the previous year. In addition, approximately 9 gpm and 11 gpm of groundwater flowed into the Hudson River from the upper and lower zones, respectively. Storm water discharging into the Discharge Canal and directly into the Hudson River was estimated to be approximately 42 and 5 gpm, respectively. These flows can be further subdivided into flow zones with further detail as shown in the table in **Appendix F**.

3.2 Groundwater Sampling

The following sections describe the groundwater sampling results and associated QA/QC protocols.

3.2.1 Groundwater Sampling Results

Groundwater samples collected on behalf of Entergy during Q2 2010 were analyzed at GEL Laboratories for Tritium, Sr-90, Cs-137, Co-60, and Ni-63²³. **Table 3** presents the Q2 2010 analytical results for these radionuclides. The rolling yearly averages, which are calculated using all the valid data from the previous year [Q3 09 through Q2 10], including Mid-Quarter and confirmatory samples, are also presented in **Table 3**. **Table 4** presents minimum detection concentrations (MDC), standard deviation, and I.L.s assigned to each well for the Q2-2010 analytical results. **Table 5** presents historic Site groundwater analytical data. Isopleth maps of rolling averages for Tritium and Sr-90 are presented in **Figures 6** and **7**, respectively. **Figure 8** presents a data map of rolling averages for Cs-137, Co-60, and Ni-63²⁴.

An overall evaluation of the sample handling, shipment and analytical procedures, indicates that the quality assurance quality control protocols have been met in Q2 2010 for all of the samples,

set of transducer data in Q2 2009. Data analyses demonstrated that recalibration to the Q4 2008 data set yielded the most conservative (highest dose to the river) calibration of the nine quarterly data sets obtained during the LTMP, and thus was adopted for further dose computations. The recalibration of the model to the Q4 2008 data yielded Unit ½ Zone and total groundwater fluxes approximately 40% and 25% greater, respectively, than the original reference (Q2 2007) data set. Further information and the data analyses are provided in the Q2 2009 LTM report.

²² To continue to validate the appropriateness and applicability of the PMBM, a subset of the existing transducers are being maintained and monitored quarterly as part of the Long Term Monitoring Program, starting with the Q3 2009 Quarterly Report. The primary objective of maintaining these transducers is to provide ongoing confirmatory data that demonstrate substantial changes to the on-Site groundwater flow field have not taken place and thus verify that the basic assumptions inherent in the PMBM continue to remain valid. The transducer locations are provided on **Figure 5A** of this quarterly report, and the rationale for the selection of these specific individual transducer locations is discussed in the Q1 and Q2 2009 quarterly reports. With regard to these ongoing long-term monitoring locations, it is noted that the transducers have a limited life. While some of the transducers can be replaced, and have been replaced in the past, others are permanently installed in the subsurface and are no longer accessible for replacement. However, with time, the base of data upon which model validity is assessed becomes increasingly more robust. Therefore, if some of these transducers fail over time, it is not likely that replacement will be imperative. This is because the likelihood of encountering a precipitation event substantially outside the already captured range becomes increasingly more remote with time as more data is collected. In addition, it is again emphasized that considerable conservatism has been incorporated within the model development and the dose rates computed are still far below those permitted by regulation.

²³ It should be noted that samples were also analyzed for gamma emitters via gamma spectroscopy. Although only Co-60 and Cs-137 are reported, gamma spectroscopy should detect and identify other gamma emitters if they became present in groundwater.

²⁴ Isopleths were not drawn for Cs-137, Co-60, and Ni-63 because the few positive detections observed did not indicate the existence of a groundwater plume containing these radionuclides. This is likely a result of the high surface affinity (highly adsorptive nature) of these radionuclides for solid geological materials. They therefore tend to rapidly partition out of the groundwater.

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and the analytical results should be useable as presented in **Table 5**. This conclusion is further supported by a review of the Q2 2010 analytical data, as compared to previous historical trends. Refer to **Section 5.2.2** of the Final 2007 Quarterly Long-Term Groundwater Monitoring Report No. 1 for further details pursuant to quality assurance quality control protocols.

3.3 Radionuclide Release Rates

The recalibrated PMBM-derived groundwater flows within each of the six flow zones are multiplied by yearly rolling average radionuclide levels within each zone to compute groundwater radionuclide release rates to the Discharge Canal and Hudson River. These groundwater radionuclide release rates are computed separately for upper and lower flow zones as well as upgradient and downgradient of the Discharge Canal. The selection of specific monitoring locations for each of the six zones is described in the January 25, 2008 Memorandum – Synopsis of Long Term Monitoring Plan Bases.

Storm drain flows²⁵ computed based on yearly precipitation rates are multiplied by radionuclide concentrations measured in the storm drains to compute the associated storm drain radionuclide release rates²⁶ to the Discharge Canal and Hudson River.

The radionuclide release rates from the groundwater and storm drains to the Discharge Canal and Hudson River for Q2 2010 are shown in the table below.

	GROUNDWATER AND SURFACE WATER TO RIVER (CI/YR)	GROUNDWATER AND SURFACE WATER TO CANAL (CI/YR)
Northern Clean Zone*	3.73E-04	0.00E+00**
Unit 2 North Zone	6.77E-04	5.07E-02
Unit ½ Zone	6.61E-03	6.97E-03
Unit 3 North Zone	3.18E-03	8.86E-04
Unit 3 South Zone	1.72E-03	1.90E-02
Southern Clean Zone*	4.11E-03	1.06E-.02

* Activity in the Northern Clean Zone is attributable to an assumed Tritium background concentration of 150 pCi/L in the groundwater. The remaining radionuclides were assumed to not be present in this streamtube. Radionuclide release rate in the Southern Clean Zone is calculated from activity measured in monitoring wells MW-40 and MW-51.

** The radionuclide release rate to the Discharge Canal from the Northern Clean Zone is zero because the Discharge canal does not extend far enough to the north to be downgradient of the Northern Clean Zone.

These release rates are then used by Entergy to calculate the radiological dose to the environment via the Discharge Canal and the Hudson River using the procedure outlined in the Liquid Radioactive Effluents (0-CY-2740) document, prepared by Entergy and dated October 17, 2008.

3.4 SSCs and Property Boundary Monitoring

In addition to providing the data for the dose computation discussed above, the Long Term Monitoring Program has been designed to also provide rapid detection of potential leaks from SSCs. This monitoring is specifically focused on those SSCs which exhibit a credible probability

²⁵ The storm drain flows also include groundwater discharges from the foundation drains for Unit 2 and Unit 3 VC Buildings, but not from the Unit 1 NCD and SFDS, which are otherwise accounted for.

²⁶ It is noted that storm drain samples are not typically taken at times coincident with peak, or even average storm drain flow rates. By its very nature, the vast majority of the flow through the storm drain system tends to be episodic and of short duration due to storm events; sampling rounds are generally scheduled to avoid such events. Radionuclide concentrations are primarily due to groundwater infiltration into the drains and thus tend to be highest during periods of little rain when this infiltration is not diluted by the storm water flow. This incongruence therefore yields a high bias to the dose computation because the elevated concentrations associated with low flow rates are multiplied by the much higher flow rates based on total yearly rainfall.

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of resulting in a visually undetected release of radionuclides to the subsurface²⁷. The monitored SSCs are shown on **Figure 4** and a description of the specific monitoring installations associated with each SSC are provided in the January 25, 2008 Memorandum – Synopsis of Long Term Monitoring Plan Bases. In addition to monitoring the SSCs, on-Site and off-Site wells are used to monitor the property boundaries for unanticipated radionuclide migration across these boundaries. Again, the rationale underpinning the selection of wells designated for this purpose is provided in the above cited Memorandum. These monitoring protocols are consistent with the NEI Groundwater Protection Initiative (GPI).

Entergy is also in the planning process to add an additional multi-level monitoring installation located near the south west corner of the Unit 3 Transformer Yard, downgradient of MW-46²⁸. While MW-46 was previously evaluated relative to Unit 3 monitoring effectiveness, and was found to be very useful for detecting potential future releases, we also concluded that without a further monitoring well installation, there is a moderate risk that some releases could go undetected. In particular, it appears that a release in the vicinity of the Waste Holdup Tank pit could potentially proceed toward the river to the south of MW-46, given the likely hydrology associated with the pre-construction bedrock valley in this area. As such, we recommend, and Entergy agreed to, the construction of an additional monitoring installation at Unit 3 to increase the robustness of the Unit 3 well network and thus reduce this potential risk. Installation of this well is currently scheduled for 2011. The sampling of U1-NCD and U1-SFDS will also be continued as part of the Long Term Monitoring Program.

I.L.s were established for the associated monitoring wells to set quantitative radionuclide concentrations above which further action would be undertaken. As part of the ongoing groundwater monitoring program, the reported analytical concentrations are compared against I.L.s established based on the criteria shown in the table below. I.L.s are currently computed each year based on yearly averages of all the valid groundwater sampling analytical results of the previous year including Aliquot, Confirmatory, and Mid-Quarter sample results²⁹. The monitoring well-specific I.L.s are presented in **Table 4** and are established for comparison with 2010 analytical results based on the quarterly samples collected and analyzed in 2009.

²⁷ As discussed further in the following sections, reporting of visually identified spills/leaks within structures is included within Condition Reports under Entergy's Corrective Action Program. Additional emphasis has been placed on routine review of these reports as they potentially relate to GPI objectives.

²⁸ A cross section has also previously been developed through the Unit 3 area to supplement **Figure 4** and further demonstrate the relationship of site groundwater flow patterns and monitoring well placement relative to the individual Unit 3 SSCs (similar cross sections were previously developed for Units 1 and 2, as presented in the Hydrogeologic Site Investigation Report). This Unit 3 cross section C-C' is included in the Q1 2009 Quarterly Report as Figure 4A.

²⁹ The calculation of ILs and yearly rolling averages prior to the Q1 2009 Report were based on the analytical results from the quarterly sampling rounds only, and therefore excluded aliquot, confirmatory and mid-quarter sample results. For the Q1 2009 Report and thereafter, if an aliquot analytical result confirms that the original quarterly analytical result was false, then only the aliquot result is utilized in the yearly IL calculation. If the aliquot result confirms the original quarterly result is valid, then both the original and the aliquot results are averaged together and then averaged into the yearly IL calculation as a single value. Confirmatory analytical results have the potential to impact the use of the original quarterly sample in the same manner as aliquots; however, unlike aliquots, these "independent samples" are averaged directly into the yearly rolling average without "pre-averaging" with the associated quarterly sample. Similar to confirmatory samples, mid-quarter samples are also averaged directly into the yearly rolling average calculation. However, mid-quarter sample results do not have any impact on the use of the initial quarterly samples as can either aliquot or confirmatory samples, as described above. In the case of both confirmatory and mid-quarter sample results, direct averaging into the yearly average of these additional results can somewhat bias the yearly average toward a particular quarter/season. However, given that confirmatory and mid-quarter samples are typically taken to confirm and/or prepare for uncharacteristically high radionuclide concentrations, this direct averaging provides a high bias to the subsequent yearly dose computations, and is thus conservative. In cases such as this where some bias inevitably will be created, establishing a conservative bias in the dose computations is considered more important than maintaining a seasonal non-bias.

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WELL ID	INVESTIGATION LEVELS (I.L.S)		
	TRITIUM pCi/L	SR-90 pCi/L	OTHER PLANT-RELATED RADIONUCLIDES
Off-Site Boundary Wells (LAF-002)	any detection*	any detection*	any detection*
On-Site Boundary Wells (MW-40, MW-51, MW-52, and MW-107)	1,000**	2**	any detection*
Riverfront Boundary Wells (MW-60, MW-62, MW-63)	2,000**	2**	any detection*
All Other Wells	>2x average***	>2x average***	>2x average***

* A radionuclide is positively detected when the result is greater than or equal to the MDC and 3 times the 1 sigma uncertainty.

** The values of 1000 and 2000 pCi/L for H-3 and 2 pCi/L for Sr-90 have been chosen to be low enough to result in timely detection of a new release or change to an existing release and still be outside the normal expected range of sample results at these locations, to the extent possible with the currently available data over time.

*** Any positively detected radionuclide that has a result greater than 2 times the average from the previous year. However, the IL is not reached until an H-3 result is also greater than 1000 pCi/L or a Sr-90 result is also greater than 2 pCi/L.

In the event that the analytical results of a groundwater sample exceed the designated I.L., the following series of actions will be considered:

- Contact the laboratory to verify that all quality control checks were satisfactory, sufficient sample volume was used; required MDC's were met, etc.;
- Re-analyze Aliquots of the original sample;
- Re-sample the location (Confirmatory sample) to verify the result;
- Increase the frequency of sampling (Mid-Quarter samples) for this location³⁰;
- Initiate an investigation utilizing Entergy's corrective action program and related resources as appropriate (e.g. site engineering / radiation protection); and
- Initiation of source/ground water remediation techniques commensurate with the potential dose impact analyses and good environmental stewardship.

3.4.1 Proactive Mid Quarter Samples

During the Q2 2010 monitoring period, there were no planned operations that required increased sampling. However, recent peaks in Tritium levels have been observed in multiple MW-31 and MW-32 sampling intervals; thus, additional Post-Q2 2010 groundwater samples were collected at all sampling intervals within MW-31 and MW-32 (as well as MW-30). The results of these samples are reported and discussed below along with the quarterly results.

3.4.2 Previous Q1-2010 Investigation Level Exceedances

As indicated in the previous Q1 2010 Quarterly LTM Report, a comparison of the Q1 2010 analytical results to their respective I.L. values shows that the I.L.s were initially exceeded in five samples. Four of these I.L. exceedances are still ongoing, and are discussed individually in **Section 3.4.4** below. The remaining I.L. exceedance (MW-31-85) was resolved during the Post Q1 2009 sampling, as summarized below. Additionally, one sampling location (U1-CSS) exceeded its I.L. in Q4 2009, with a semiannual schedule resulting in the next sample taken this quarter (Q2 2010); these data show that the Q4 2009 I.L. exceedance was resolved this quarter, as also summarized below.

³⁰ It is noted that Mid-Quarter samples are also proactively obtained when plant operations could potentially result in an increased probability of a release to the subsurface.

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MW-31-85. The Q1 2010 Tritium result at this location exceeded the I.L. by a factor of nearly two. The Q1 2010 result was also the highest Tritium activity measured in MW-31-85 since the initiation of the LTMP. This exceedance was attributed to Unit 2 RWST/R.O. processing skid surface spill. It is further noted that this depth interval, the deepest in MW-31, responded to the release faster than the mid-depth interval (MW-31-63; see **Section 3.4.4**)³¹. Based on this Q1 2010 Tritium peak, a proactive mid-quarter sampling round (Post-Q1 2010) was initiated for monitoring installation MW-31, as well as MW-30 and MW-32³². The Tritium activity in this subsequent MW-31-85 sample decreased by nearly an order of magnitude, to well below the Tritium I.L. for this sampling depth interval. Additionally, both the Q2 2010 and Post-Q2 2010 Tritium results have remained below the I.L. for MW-31-85³³. These data further support the conclusion that the Tritium peaks observed in Q1 2010 (both MW-31-85 and other MW-31 and MW-32 sampling intervals) are attributable to the transient surficial Unit 2 RWST/R.O. processing skid spill first identified through 80-10 sampling of MH-9. GZA will continue to collect Mid-Quarter samples to monitor Tritium level variability in MW-31.

U1-CSS (Q4 2009). The previous Strontium activity measured at this location in Q4 2009 was slightly above the I.L. for Q4 2009. Because this well is scheduled for semiannual sampling, the Q4 2009 Strontium exceedance was not resolved until this, Q2 2010, quarterly report. The current data show the Q2 2010 Strontium activity to have decreased by a factor of nearly two, which yields a level below the 2010 Strontium I.L. for U1-CSS. Because the Q4 2009 (and also the Q2 2009) Strontium activity in this well is likely associated with the raising of the water levels and increased leakage in the Unit 1 SFPs during the previous defueling³⁴, it was anticipated that the Strontium levels at this location would decrease to pre-defueling levels because the remaining fuel has been removed and the water drained from the Unit 1 SFPs. As anticipated, the Q2 2010 Strontium activity is similar to pre-defueling levels at this location.

3.4.3 Q2-2010 Boundary Investigation Levels

A comparison of the Q2 2010 analytical results for the On and Off-Site Boundary Wells to their respective I.L. values shows that the I.L.s were not met for any of the monitoring locations. Therefore, there was no requirement to further investigate radionuclide activity in these wells. However, monitoring installation MW-40 and MW-51 are being further evaluated on a routine basis, as discussed below.

MW-40 and MW-51. While there have been no historic I.L. exceedances at these two southern boundary locations, and the majority of the data from this quarter (Q2 2010) fall within previous ranges (Tritium level in MW-40-46 was at a historic maximum, but still below 250 pCi/L), these monitoring locations continue to be closely scrutinized on a routine basis given the sensitivity associated with the southern power block boundary. Even though it is recognized that the peak Tritium levels detected are low (less than 350 pCi/L) and near the lower limit of detection, there

³¹ It is noted that the shallowest interval in MW-31 (49') did not exhibit a Tritium peak in the Q1 2010 or Post Q1 2010 samples. In fact, these quarter one samples yielded particularly low Tritium activities. However, Tritium activity peaked in Q4 2009 at a level nearly equal to the highest historically measured in this depth interval. Therefore, rather than potentially lagging deeper intervals, the Tritium peak in this shallowest interval may have preceded the deeper intervals at this location. As such, it is therefore also possible that the Q4 2009 peak in this well resulted from the Unit 2 RWST/R.O. processing skid or related activities, rather than from the storage/Retention Mechanism as it was previously attributed to in the Q4 2009 Quarterly Report.

³² This mid-quarter sampling event was also initiated, in part, due to the Q4 2009 Tritium peak in MW-31-49, as well as the overall Tritium variability historically observed in MW-30, 31 and 32.

³³ It is noted that an increasing trend is observed in the Tritium activity data during the Q2 2010 and Post-Q2 2010 sampling rounds; however, these results are still less than the Q1 2010 Tritium result by a factor of two. This subsequent increasing trend is likely due to prior recharge of the Retention Mechanisms by the original RWST/R.O. processing skid spill, resulting in further subsequent releases from these Retention Mechanisms into the groundwater flow regime.

³⁴ The U1-CSS monitoring well is located downgradient of the Unit 1 SFPs, and appears to be situated along an anthropogenic preferential flow path. This well was installed through the East wall of the Containment Spray Sump. It is therefore located directly below the utility trench associated with this system as well as that associated with the historical discharge pipe for the Unit 1 NCD.

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appears to be a general correlation in Tritium peaks at multiple depth intervals in both of these monitoring installations (see **Figure H1** in **Appendix H**). An appropriate metric to evaluate whether or not these peaks are due to groundwater migration of Tritium from the power block area is the relative groundwater elevations between these locations and the power block areas where Tritium contamination exists. As discussed at length in the CSM sections of the Site Investigation Report, southern boundary groundwater elevations are well above those in the power block area. As such, groundwater, and thus Tritium in the groundwater, cannot migrate from the power block to the south; in fact, groundwater is migrating in the opposite direction. This conclusion was previously validated for nine quarters (between Q2 2007 and Q2 2009) through analyses of groundwater elevation contours (see **Figure 5** in the quarterly reports prior to Q3 2009). In addition, starting with the Q1 2009 Quarterly Report, **Figure 5A** is being generated to specifically compare high importance transducer readings to historic maximum and minimum readings. The objective of this analysis is to demonstrate that substantial changes to the on-site groundwater flow field have not taken place and that the CSM remains valid. Multiple sampling zones from both the MW-40 and MW-51 monitoring installations are included in this analysis. Based on these analyses, as well as the substantial body of data developed over the last 5 years of investigation which underpin our CSM, we state, with a high degree of confidence that the low level peaks in the Tritium activities observed in these two monitoring installations are not due to groundwater migration from the power block area. This conclusion has continued to be validated each quarter. However, we do not have a definitive explanation for the observed peaks. Further investigation into other potential mechanisms, such as atmospheric Tritium washout and seasonal laboratory biases are ongoing.

3.4.4 Q2 2010 SSC Investigation Levels

For the SSC monitoring wells, a comparison of the Q2 2010 and Post-Q2 2010 analytical results to their respective I.L. values shows that the I.L.s were met at ten sampling locations. The following table summarizes the cases where the I.L.s were met, with these exceedances individually discussed below.

WELL ID	RADIONUCLIDE	RESULT (PCI/L)***	REANALYZED RESULT (PCI/L)	INVESTIGATION LEVEL (PCI/L)
MW-31-63 (Post Q2)	H3	51,100	NA*	39,857
MW-32-59 (Q2 2010 / Post Q2)	H3	68,300 / 155,000	NA*	34,230
MW-32-149 (Q2 2010 / Post Q2)	H3	6,600 / 9,760	NA*	1,000
MW-32-173 (Q2 2010 / Post Q2)	H3	1,540 / 2,340	NA*	1,496
MW-36-24	H3	3,530	NA*	2,563
MW-37-40	Sr-90	17.1	NA*	16.7
MW-50-42	H3	1,360	NA*	1,038
MW-53-82	H3	4,710	NA*	3,828
MW-111	Cs-137	6.79	NA*	Any detection***
U3-4D	H3	1,070	NA*	1,000

* NA indicates that the sample was not reanalyzed.

** ND indicates that the radionuclide was not detected greater than or equal to the MDC and 3 times the 1 sigma uncertainty.

*** A radionuclide is positively detected when the result is greater than or equal to the MDC and 3 times the 1 sigma uncertainty.

MW-31-63. Following the Post-Q1-2010 sample at this location (highest measured Tritium activity since the initiation of the LTMP), the Q2 2010 Tritium results at MW-31-63 showed a four-fold decrease, to levels well below the I.L. However, another Tritium peak was observed in the Post-Q2 2010 results, with Tritium activity back above the I.L. These peaks in Tritium activity were likely due to a localized, transient surface spill during Unit 2 RWST/R.O.

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processing skid operation in Q4 2009³⁵. This release was first detected during routine 80-10 sampling of MH-9 in January, 2010³⁶. Given that the apparent source of this peak has been terminated and Tritium levels quickly returned to pre-release levels in MH-9, decreases in Tritium level to below the I.L., are expected in MW-31-63 once the residual impact of the RWST/R.O. spill, as mediated through the Retention Mechanisms, has subsided (see further discussion below and in **Section 3.4.5**).

In this regard, it is noted that peaks in Tritium level, likely related to mobilization of historically stored Tritium³⁷ (Retention Mechanism), have been noted in MW-31-63 since the Q1 2009 sampling event, with somewhat less, but still noticeable variability evident all the way back to the beginning of monitoring. This behavior has also been noted in other sampling depths at this location as well as at proximate locations MW-32 and MW-30, particularly at shallower depth intervals³⁸. Therefore, while the transient RWST/R.O. processing skid source had been terminated prior to the Tritium peak observed in the Post-Q2 2010 sample, this subsequent peak is still likely due to the spill through replenishment of the Retention Mechanisms, thus resulting in further releases from these Retention Mechanisms into the groundwater flow regime. Therefore, future Tritium increases at this sampling location due to the transient RWST/R.O. processing skid spill are still likely. As such, this location will be subject to added scrutiny during the upcoming quarterly monitoring rounds to better evaluate its variable Tritium activity.

MW-32-59. Similar to the Q1 2010 and Post-Q1 2010 samples, both the Q2 2010 and Post-Q2 2010 Tritium results at this sampling location exceeded the Tritium I.L.. The Post-Q2 2010 result was the highest Tritium activity measured at this location (in all depth intervals) since the initiation of the LTMP, and exceeded the I.L. by a factor of nearly five. Similar to the MW-31 Tritium I.L. exceedances, this Tritium peak has also been attributed to the transient surface spill which occurred in Q4 2009 during Unit 2 RWST/R.O. processing skid operations. In addition to entering the subsurface through the storm drain system, this spill also entered the MW-32 well vault³⁹, and may have penetrated the well casings, thus potentially explaining the particularly high Tritium activities observed in this shallowest interval in MW-32. Because the surface spill was transient in nature, as concluded, in part, from the MH-9 data, it is expected that the Tritium activity should again quickly decrease below the I.L. at this location. However, this expected decrease could be masked by future contributions of Tritium from the storage/Retention Mechanism(s), as discussed more fully above for MW-31-63. As such, this location will therefore be subject to added scrutiny during the upcoming quarterly monitoring round.

³⁵ Based on forensic research conducted by Entergy, it appears that the date of the spill was November 21, 2009.

³⁶ On January 14th and 15th, 2010, the Tritium levels were measured at ~85,000 pCi/L in MH-9. These levels decreased to 4,650 pCi/L in the January 19th, 2010 sample. Typical Tritium levels prior and post-spill were ~1,500-4,000 pCi/L in MH-9. It is therefore likely that the increased Tritium measured in MW-31 and MW-32 entered the subsurface through a storm drain pathway.

³⁷ As discussed in the January 7, 2008 Hydrogeologic Site Investigation Report, it has been concluded that portions of the Tritium released prior to Energy's last remediation interdiction (rectifying the Transfer Canal liner weld imperfection in December 2007 - the final identified leak) have been stored in the subsurface (Retention Mechanism(s)),

³⁸ As discussed in previous quarterly reports, the historic variability in Tritium activity measured in MW-30, 31 and 32 has typically been attributed to the mobilization of Tritium stored in the shallow bedrock and/or within anthropogenic structural features. This storage/Retention Mechanism(s) was confirmed during tracer testing as described in the Hydrogeologic Site Investigation Report prepared by GZA, dated January 7, 2008, and as further supported by more recent tracer data discussed in the Q1 2009 LTM Report. Therefore, while the storage/Retention Mechanism(s) clearly contribute to the observed Tritium variability, it is equally clear that some of this variability is attributable to localized transient release events.

³⁹ An initial sample was taken of the water remaining in the MW-32 vault on 2/1/2010. This water exhibited a Tritium activity of 390,000 pCi/L. Subsequent sampling of this water in May measured residual Tritium levels of ~65,000 pCi/L prior to the water being fully removed from the vault. It is further noted that the water in the vault contained other radionuclides in addition to Tritium. These included Co-60, Sb-125, Cs-134, Cs-137, etc. Therefore, the Q1 2010 groundwater data from wells proximate to, and downgradient of, the MH-9 and MW-32 vault release points were evaluated for detections of these radionuclides, none were found. However, Cs-137 was detected at MW-111 in Q2 2010. While this well is located downgradient of MW-32, no other wells showed detections of Cs-137, or the other radionuclides discussed above, in Q2 2010. Cs-137 at MW-111 and downgradient of MW-111 will be closely monitored in the upcoming quarterly reports.

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MW-32-149. The Q2 2010 and Post-Q2 2010 Tritium activity at this location continued to increase above the Q1 2010 level to nearly ten times the I.L. in the Post-Q2 2010 sample. Only the first sample collected at this location (1/19/2007) showed a higher Tritium activity (10,500 pCi/L) than the Post-Q2 2010 sample results (9,760 pCi/L). Similar to the other MW-31 and MW-32 exceedances discussed above and below, this Tritium peak has also been attributed to the transient surface spill which occurred in Q4 2009 during Unit 2 RWST/R.O. processing skid operations. The quick response of this deep sampling interval to the Tritium surface release provides further evidence that the spill may have penetrated the well casings and entered the subsurface immediately proximate to the sampling installation. This conclusion is based on the previously observed behavior of this sampling interval, which had historically exhibited a relatively uniformly decreasing trend for the last three years, absent the peaks observed in shallower intervals⁴⁰. As discussed above for MW-32-59, the future behavior of this sampling interval is in question and will therefore be subject to added scrutiny during the upcoming quarterly monitoring round.

MW-32-173. Both the Q2 2010 and Post-Q2 2010 Tritium results exceeded the I.L. at this sampling location. The previous Q1 2010 sampling result also showed an increase in Tritium activity to levels near the I.L. Similar to the other MW-31 and MW-32 exceedances discussed above, this increase in Tritium levels has also been attributed to the transient surface spill which occurred in Q4 2009 during Unit 2 RWST/R.O. processing skid operations. The delayed response, compared to MW-32-59 and MW-32-149, and the shallower slope to the increasing trend at this sampling depth provide evidence that this depth interval may be responding to vertically downward migration from above. This conclusion is supported by both the four-fold higher activities measured in intervals immediately above this point, as well as the strong vertically downward gradients exhibited by the bedrock formation at this location. As discussed above, the Tritium activity at this depth interval should decrease as the Tritium activity above decreases (given the transient nature of the spill), but is likely to decrease more slowly. It is also noted that the expected decrease could be masked by future contributions of Tritium from the storage/Retention Mechanism(s), as discussed more fully above for MW-31-63. As such, this location will therefore be subject to added scrutiny during the upcoming quarterly monitoring round.

MW-36-24. The Q2 2010 Tritium activity at this sampling location slightly exceeded the Tritium I.L. The Tritium I.L. was previously exceeded at MW-36-24 in Q3 2009; but the Q4 2009 and Q1 2010 results showed a decreasing trend over that time period. Therefore, this I.L. exceedance is not likely related to the past exceedance. Because this sampling interval is located downgradient of MW-32, the likely source of this Tritium increase is also the transient Unit 2 RWST/R.O. processing skid surface spill. Because the probable source is terminated and Tritium is a non-sorbing radionuclide, the Tritium levels at MW-36-24 should relatively quickly decrease below the I.L. This location will be subject to added scrutiny during the upcoming quarterly monitoring round.

MW-37-40. The Strontium result for Q2 2010 slightly exceeded the I.L. for this sampling interval. An elevated Strontium activity has been observed at MW-37-40 since Q3 2009, which has been attributed to a delayed response to the increase in water levels during defueling operations in the Unit 1 SFPs. The trend for this depth interval over the previous two years is similar to those exhibited by the intervals immediately above and below (MW-37-32 and MW-37-57), except that MW-37-40 lags in response somewhat. This time lag is likely a result of the lower hydraulic conductivity (by two to three orders of magnitude) of the bedrock accessed by this depth interval. Because MW-37-57 had already decreased to pre-defueling

⁴⁰ It is also noted that the sampling interval immediately above this interval, MW-32-85, did not exhibit a Tritium peak in Q1 2010; however, the Tritium activity increased during Q2 2010 and Post-Q2-2010 to levels slightly below the Tritium I.L.

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levels and MW-37-32 had steadily decreased towards pre-defueling levels over the past three quarters (see **Figure 7A**), it is expected that the Strontium activity in MW-37-40 will begin to decrease towards pre-defueling levels over the next few quarterly monitoring rounds. This location will be subject to added scrutiny during the upcoming quarterly monitoring round.

MW-50-42. The Q2 2010 Tritium results slightly exceeded the I.L. at this sampling location. Similar to MW-36-24⁴¹, this monitoring location is downgradient of MW-32; and the likely source of this Tritium increase is also the transient surface spill related to Unit 2 RWST/R.O. processing skid operations. Because the probable source is terminated, the Tritium levels at MW-50-42 should decrease below the I.L. at this sampling location. This location will be subject to added scrutiny during the upcoming quarterly monitoring round.

MW-53-82. After generally⁴² stable levels for the previous 3.5 years, a peak in Tritium activity was observed at this location during the Q1 2010 sampling event. Tritium levels exceeding the I.L. by slightly under a factor of two and are the highest observed since Q4 2006. The Tritium activity decreased during the Q2 2010 sampling event, but the activity at this location still exceeded the Tritium I.L. While MW-53 is not located in the groundwater flow path downgradient of the Unit 2 RWST/R.O. spill, the timing of this peak is consistent with this release. In addition, and more importantly, this location has previously been demonstrated to be “down-slope” of the Unit 2 RWST/R.O. spill along vadose zone flow paths, as demonstrated by the tracer testing conducted as part of the hydrogeologic site investigations (see Figure 7.2 of the Hydrogeologic Site Investigation Report, January 7, 2008). While it is noted that other monitoring locations in the vicinity of MW-53-82 did not exhibit peaks in Tritium activity during the Q1 2010 and Q2 2010 sampling events (e.g., the deeper, companion sampling interval (MW-53-120), the two sampling intervals in upgradient monitoring well MW-42 and the nearby U1-NCD monitoring location), these findings are also consistent with the tracer test data as shown in the above referenced Figure 7.2. Therefore, it appears that the Tritium peak observed in MW-53-82 is a result of the Q4 2009 Unit 2 RWST/R.O. spill. As such, this location, as well as downgradient locations, will be subject to added scrutiny during the upcoming quarterly monitoring round.

MW-111. Cesium was detected for the first time at this sampling location during Q2 2010. The Cesium activity was only slightly greater than the three times 1 sigma uncertainty level. Therefore the Cesium detection at MW-111 may be nothing more than a laboratory false positive. However, this well will be subject to further scrutiny in the next monitoring report.

U3-4D. The Q2 2010 Tritium result slightly exceeded the I.L. at this sampling location⁴³. Additionally, the Tritium activity during the Q1 2010 sampling event showed a noticeable increase above the lower levels seen in 2008 and 2009 at U3-4D. While it is not understood what caused this Tritium increase at U3-4D, it is possibly related to a delayed response to the Tritium increase noted in manhole A-2 and MW-45-42 in Q2 2009. As such, it would be anticipated that the Tritium levels would rapidly decrease in U3-4D, similar to A-2 and MW-45-42. This sampling location will be subject to added scrutiny during the upcoming quarterly monitoring round.

⁴¹ It is noted that MW-36-24 and MW-50-42 are similarly located proximate to the upgradient (eastern) discharge canal wall, and are likely at least somewhat connected along preferential flow paths associated with the canal wall construction (e.g., blast-fractured bedrock) and backfilling with permeable soils (Unit 2). As such, it is not surprising that these two sampling locations have shown remarkably similar Tritium trends over the past 2.5 years

⁴² It is noted that a clear peak in Tritium activity in this interval was measured in Q1 2009. This peak was attributed to a transient release from the Unit 1 distillation tank valves, which subsequently has appeared to have dissipated through the groundwater flow system.

⁴³ It should be noted that the Tritium I.L. is only 1,000 pCi/L at this sampling location, and the Q2 2010 analytical results was 1,070 pCi/L. Therefore, the Q2 2010 Tritium activity at U3-4D is still five times lower than the lowest isopleth drawn for the Unit 2 Tritium plume (5,000 – 10,000 pCi/L). It is noted that there is no Tritium plume associated with Unit 3.

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U1 NCD AND U1-SFDS. Sampling of the Unit 1 North Curtain Drain (U1-NCD) and the Unit 1 Sphere Foundation Drain Sump (U1-SFDS) are currently included as part of the Long Term Monitoring Program. These drains have been documented to capture a large proportion of the Strontium leakage from the Unit 1 SFPs, and continue to collect groundwater containing Strontium and Cesium and direct it to treatment. These drains have also historically been assumed to collect some groundwater contaminated with Tritium from the Unit 2 SFP. This conclusion was validated by the tracer test conducted as part of the hydrogeologic site investigation (see the Hydrogeologic Site Investigation Report prepared by GZA, dated January 7, 2008). The limited amount of quarterly sampling data as well as the impact of the Unit 1 defueling operations render the setting of I.L.s for these monitoring points currently premature. However, visual inspection of the existing data was performed and a continued decrease in Tritium levels was exhibited by the U1-SFDS data, while relatively stable (limited increase) Tritium levels in U1-NCD are evident through Q1 2010⁴⁴. Strontium data from these drains continued to show decreases to pre-defueling levels, as summarized on **Figure 7A**.

3.4.5 Conclusions - Boundary and SSC Leak Detection Monitoring

Recognizing that measured activities in the Off-Site and On-Site Boundary Wells have remained below I.L. levels, this overall data set continues to demonstrate that radionuclides are migrating toward the Hudson River to the West, and are not migrating off of the property to the North, East or South, as expected given the measured groundwater flow directions from the property periphery toward the power block area.

Given the analyses discussed above, there is also no compelling reason to believe that any new unidentified leaks have developed in the SSCs monitored relative to Unit 2 or 3. However, as discussed in the Q1 2010 Quarterly Monitoring Report, a peak in Tritium activity was measured in MH-9 during routine 80-10 Effluents Program sampling. The Q1 2010 sample from the upper-most interval of MW-32 (MW-32-59) also exceeded its I.L. with the highest Tritium activity measured since the initiation of the LTMP. After further investigation by IPEC, it appears that these Tritium increases originated from a Q4 2009 localized, transient surface spill involving the Unit 2 RWST/R.O. processing skid; the temporary leakage likely emanated from connection hoses during or just after the filtration process. It appears that this transient release entered both MH-9 and the well vault for MW-32 (which employs a drain emptying into MH-9), and may have also penetrated the MW-32 well casings. Both the storm drains and the well vault likely provided pathways for radionuclides to enter the subsurface. Relative to the Q1 2010 data, the Q2 2010 and Post-Q2 2010 data shows further I.L. exceedances both at deeper intervals (MW-32-173) and farther down gradient (MW-36-24 and MW-50-42), as would be expected as the spill works its way through the groundwater flow regime. These additional Tritium exceedances have also been attributed to this transient R.O. skid surface spill. Based on the above analysis, it is clear that a previously unidentified transient spill has once again successfully been identified by the LTMP.

The U2 plume⁴⁵ is continuing to generally exhibit overall, long-term reductions in Tritium activity⁴⁶. While Q2 2010 increases in Tritium activity have been observed in multiple monitoring locations within the delineated U2 plume, these data are consistent with both the Q4 2009 transient RWST/R.O. processing skid surface spill and the overall historic variability observed in Tritium levels attributed to episodic releases of Tritium stored in the subsurface via

⁴⁴ Both the NCD and SFDS were not sampled during the Q2 2010 monitoring event.

⁴⁵ It is noted that there is no Tritium plume associated with Unit 3.

⁴⁶ As discussed in **Section 3.5.1**, it is noted that an increase has been observed in the total plume Tritium activity, as elucidated in **Figure G-17**. This Tritium mass increase has been attributed to the transient RO. skid surface spill, which should only temporarily increase the Unit 2 Tritium mass, with reductions back to the previous trend once the Tritium from the spill moves through the system.

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natural and anthropogenic Retention Mechanisms⁴⁷. This conclusion is further supported by the tracer data and other analyses⁴⁸ discussed in Section 3.6 of the Q1 2009 Long Term Monitoring Report.

Relative to the Unit 1 Strontium data, increased leakage was anticipated during final fuel removal from Unit 1 SFPs. This leakage was readily detected as increased Strontium in the groundwater by the Long Term Monitoring Program. The initial near-pool and subsequent downgradient Strontium increases have been routinely monitored as summarized on **Figure 7A**. Currently, the near-pool and more downgradient monitoring locations have generally returned to pre-defueling Strontium levels, with outliers (such as MW-37-42, the only remaining Strontium I.L. exceedance⁴⁹) expected to continue to show further decreases towards pre-defueling levels in the upcoming quarters.

Overall, GZA believes that continued monitoring will further demonstrate decreasing long term trends in groundwater contaminant activities over time for both the Unit 1 and Unit 2 plumes given the source interdictions completed by Entergy. However, ultimate confirmation of these conclusions will require monitoring over a number of years to demonstrate continued depletion of Tritium and Strontium from the Retention Mechanisms originally sourced by: (1) historic Unit 2 SFP Tritium leakage; and (2) the historic and more recent Strontium leakage due to Unit 1 defueling, as well as impacts associated with a number of localized, transient release events. It is further noted that quantification of these overall radionuclide reductions will require that ranges in seasonal variation be adequately reflected in the monitoring data and any further additions of radionuclides to the Retention Mechanisms, such as through the transient releases discussed above, be dissipated from the geohydrologic flow regime.

Given the above cited constraints, it is premature to begin recalibrating the I.L.s, which were originally established at the beginning of the LTMP in 2007. Since inception of this program, it has been observed that I.L.s have been routinely exceeded in a number of cases where subsequent data have demonstrated that no new leaks have occurred. The majority of these cases occur where the radionuclide levels are generally low and/or near their detection limits. It appears that data variability, likely due to seasonal precipitation influences and local variations in flow paths and/or other in-situ processes, is the primary cause of these false positives⁵⁰, particularly pursuant to Tritium. Therefore, the basis upon which the I.L.s are computed needs to be re-evaluated in light of the long-term natural transient variability of the groundwater system in response to precipitation events, etc. Furthermore, while re-evaluation/re-setting of I.L.s is a clear goal, it is still premature given the lack of sufficient data. This is particularly true given the recent behavior in Strontium levels due to the Unit 1 defueling (see **Figure 7A**) and the transient Tritium releases discussed above and in the Q1 2009 Quarterly LTM Report. As such, the current I.L.s will remain in effect while a sufficient data base is acquired to allow better quantification of the natural (non-leak related) variability in the data.

Five critical conclusions can be drawn from the above summarized data and analyses:

⁴⁷ These Retention Mechanisms are discussed along with the CSM in the previously cited Hydrogeologic Site Investigation Report.

⁴⁸ These data and analyses further support a conclusion that the Unit 2 SFP had ceased leaking after the transfer canal "pin hole leak" was repaired in late 2007. However, given the more recent behavior observed in the Unit 2 collection box data (see Section 3.6 of the Q1 2009 Long Term Monitoring Report), additional investigations/data evaluations are underway to further rule out potential Unit 2 SFP leak mechanisms.

⁴⁹ As discussed above, the 42 foot interval in the MW-37 monitoring installation is showing a delayed decrease in Strontium levels as compared to the depth intervals above and below. This response time lag is likely a result of the lower hydraulic conductivity (by two to three orders of magnitude) of the bedrock accessed by this depth interval.

⁵⁰ In this context, "false positive" does not refer to an error in the actual data value. Rather, it means that the I.L. exceedance in question did not result from a new release. While I.L.s are meant to be set at conservatively low values, and thus "false positives" should be expected, a corollary objective is to set I.L. values which keep the number of false positives low enough to eliminate development of complacency.

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1. The current CSM for the IPEC site provides a good basis for the design of the Long Term Monitoring Program;
2. the procedures and rationale used for selecting monitoring locations for leak detection have been further validated given the clear detection of the confirmed Unit 1 SFPs increased leakage during fuel removal, the transient Q1 2009 U1 FSB distillation tank valve leak (see Q4 2009 Quarterly LTM Report for further discussion), the surficial release of Tritium to Manhole A2 in Q2 2009, and the Q4 2009 Unit 2 RWST/R.O. processing skid surficial release to MH-9;
3. increases in Strontium levels following a documented leak take longer to materialize in the groundwater than might otherwise be expected⁵¹;
4. localized, transient Tritium spills have a pronounced short term impact on Unit 2 Tritium plume activity, with potential longer term impacts via Retention Mechanism(s); and
5. Even with the somewhat increased Tritium levels currently observed due to the Unit 2 RWST/R.O. skid transient surface spill, the amount of radionuclides being released through the groundwater pathway is still small compared to permitted levels of Tritium discharge to the river through the Discharge Canal.

3.5 Plume Natural Attenuation Monitoring

The fourth and final objective of the Long Term Monitoring Program is to evaluate if the groundwater plumes identified on-Site demonstrate overall reductions in total activity over time, as is consistent with the requirements of Monitored Natural Attenuation (MNA), the selected remediation for the IPEC Site⁵².

Given the likely ages of the SFP leaks identified and characterized during the hydrogeologic investigation, it is probable that the Unit 2 (Tritium) and Unit 1 (Strontium) plumes had reached steady state conditions prior to the beginning of the LTMP. Given that: (1) the identified leaks in the Unit 2 SFP have all been previously repaired (the last leak repaired in 2007) and; (2) the water in the Unit 1 West Pool underwent intensified demineralization (beginning in April 2006 with a reduction in Strontium levels of over 95 percent), one might expect that the plumes should have started to markedly attenuate toward zero with time. Both plumes have in fact generally shown significant levels of attenuation, when they are viewed in their entirety and past release events and expected seasonal variability in the sampling data are accounted for. However, the attenuation has not been as rapid as we originally anticipated during time frames subsequent to the source interdictions implemented by Entergy.

In the case of the Unit 2 Tritium plume, levels have dropped markedly from the highest levels measured during the two-year hydrogeologic investigation. However, the rate of Tritium decrease with time has decreased. This rate of reduction has been difficult to predict due to the impact of natural geologic and anthropogenic Retention Mechanisms. These subsurface features have trapped and stored Tritium released during historic Unit 2 SFP leaks, and are still likely releasing this Tritium to the groundwater flow regime in an episodic manner after the physical leaks have been terminated. This conclusion is consistent with the original CSM presented in the Hydrogeologic Site Investigation Report, as further supported by the tracer test data in that report as well as subsequent tracer data, as described in Section 3.6 of the Q1 2009 Quarterly Monitoring Report, dated July 2, 2010. In addition, trend identification is further complicated by impacts associated with localized transient releases (most recently, the

⁵¹ Given the proximity of monitoring installations to documented release events, the delay in release arrival is likely due primarily to Strontium partitioning and the time required for leakage to traverse anthropogenic features.

⁵² The selection of MNA as the remediation for the Site is more fully discussed in the Hydrogeologic Site Investigation Report.

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RWST/R.O. processing skid surface spill). As described above, these transient spills have resulted in a clearly identified, increasing trend in Tritium activity in a number of wells proximate to, and downgradient of, these spills. As such, these increases do not appear to be indicative of a new leak in the Unit 2 SFP. Further discussion of this quarter's data pursuant to evaluation of the Unit 2 Tritium plume MNA is provided in **Section 3.5.1** below.

Relative to the Unit 1 Strontium plume, Strontium levels should drop much more slowly than Tritium levels. This is because, in addition to the Retention Mechanisms discussed above for Tritium (which also apply to Strontium), Strontium also undergoes partitioning whereby this radionuclide is adsorbed from the groundwater onto solid surfaces (both geologic and anthropogenic). When the input of Strontium to the groundwater is reduced (such as via the initial fuel pool demineralization and subsequent decommissioning) the solid surfaces desorb Strontium back into the groundwater, thus maintaining Strontium levels. Strontium partitioning is therefore expected to substantially slow plume attenuation. Despite partitioning effects, some plume attenuation was observed in response to pool demineralization prior to defueling, particularly proximate to the pool. However, defueling of Unit 1 resulted in a temporarily increase in the leakage rate of West Pool water into the formation. This was expected based on previous work on the Unit 1 SFPs, but was unavoidable given the requirement to raise the pool level for fuel rod removal⁵³. The increased leakage rate had resulted in a noticeable increase in Strontium levels in the immediate vicinity, and downgradient of, the fuel pool. However, as more currently observed, the near-pool and more downgradient monitoring locations have generally returned to pre-defueling Strontium levels, with outliers expected to continue to show further decreases towards pre-defueling levels in the upcoming quarters, as discussed further in **Section 3.5.2** below.

3.5.1 Unit 2 Tritium Plume Attenuation

Qualitative Evaluation

From a qualitative perspective, a reduction in overall Tritium activity in the Unit 2 plume can be seen through a comparison of the Q2 2010 delineated plume boundary (**Figure 6A**) to those in early LTMP quarterly reports (2207 and 2008). Not only have Tritium levels within the plume generally shown an overall, long-term decreasing trend, but the reductions over the past few quarters downgradient of the discharge canal have become particularly evident in the delineated, shaded bounds of the plume. This quarter continues the trend where the shaded plume⁵⁴ no longer extends to the river as it did in previous quarters through 2008. Additionally, the rolling average Tritium activity in MW-111, indicative of the core of the plume, again continued to decrease this quarter (Q2 2010). It is currently down to almost one-half of the 50,000 pCi/L plume isopleth, which it had previously always exceeded prior to Q4 2009. This trend over time has been summarized on **Figure 6A**, which is a compilation of the quarterly Tritium plume maps as well as that from the Investigation Report.

⁵³ As of late 2008, all the fuel rods have been removed from the Unit 1 SFPs and the pool water has been drained. As such, the Unit 1 SFPs is no longer an active source of radionuclides to the subsurface.

⁵⁴ The plume shading on **Figure 6** demarks the estimated boundary that separates Tritium levels greater than 5,000 pCi/L from those below this value. This plume delineation boundary value equates to one-quarter of the drinking water standard for Tritium. Although GZA emphasizes that drinking water standards (USEPA MCLs) do not apply to the IPEC property given that there are no drinking water sources on or proximate to the site, the MCLs do provide a useful benchmark for comparisons of relative human risk. Where yearly rolling average radionuclide activity data were available for multiple depths at a given location, GZA used the highest value to develop plume delineations. This is a typical approach to represent three-dimensional contaminant data sets on two-dimensional maps.

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Mann-Kendall Quantitative Analysis

To more quantitatively evaluate MNA progress, a Mann-Kendall analysis, as referenced in USEPA Guidance for Data Quality Assessment – Practical Methods for Data Analysis,⁵⁵ was performed on the Tritium levels measured through Q2 2010 at monitoring locations associated with the IP2-SFP and downgradient Unit 2 Tritium plume. This statistical technique was chosen because it is particularly well suited for data sets with a limited number of points. Each of the vertical monitoring intervals at each monitoring installation location was analyzed separately. In general, only data collected after final completion of the multi-level installation⁵⁶ was used. However, there were a number of exceptions to this generalization where open borehole and/or borehole packer testing data were also used. These data were incorporated where possible given the importance of early time data (proximate to when documented leaks were still active). Additional, more detailed discussion relative to the basis for these analyses is provided in Section 3.6 of the Q1 2009 Quarterly LTM Report.

Graphs showing the variation in Tritium concentration over time in the immediate vicinity of the Unit 2 SFP are presented as **Figures G-1, G-2 and G-3** in **Appendix G**, for MW-30, 31 and 32, respectively. Additional graphs are also presented in the appendix for the other monitoring locations downgradient of the Unit 2 SFP (see **Figures G-4 through G-14** for MW-33 through 37, 42⁵⁷, 49, 50, 53⁵⁸ 55 and 111) and downgradient, river boundary wells (see **Figures G-15 and G-16** for MW-66 and 67, respectively). Because these two river boundary wells' data sets now have the recommended minimum number of data points (ten) for the Mann-Kendall analysis method as of Q1 2010, they have been included in this quarter's (Q2 2010) analysis.

The Mann-Kendall analyses for the individual monitoring points are summarized on **Table G-1** in **Appendix G**. The table includes the results of the analysis for each depth interval ("well") at each of the multi-level monitoring locations enumerated above. The table is color coded, with green shading designating wells showing a decreasing trend, yellow for no trend, and red for an increasing trend.

Comparison of **Table G-1** for Q2 2010 to that from Q1 2010 demonstrates that there have been no major changes⁵⁹. Of the 32 non-river-boundary intervals included on the table for Q2 2010,

⁵⁵ USEPA Guidance for Data Quality Assessment – Practical Methods for Data Analysis, EPA QA/G9, QA00 UDATE; EPA/600/R-96/084, July, 2000.

⁵⁶ Each borehole was completed as a multi-level installation. These multi-level completions were designed to segregate the borehole length into individual sampling zones with depth. The sampling zones were generally established to coincide with the more productive zones of the fractured bedrock and overburden (both natural soils and backfill). These sampling zones were then isolated from each other with various types of seals placed in the open borehole. The objective of the seals is to prevent vertical flow through the borehole and thus establish the same conditions in the formation which existed prior to the drilling of the borehole. As such, the Tritium data is considered depth-discrete. It is noted that the multi-level installations at some monitoring locations were removed and replaced with upgraded systems, such as for the monitoring installation at MW-32.

⁵⁷ MW-42 and MW-53 are located downgradient of the Unit 1 SFPs, rather than the Unit 2 SFP. However, these two wells were included in the analyses due to the long-standing hypothesis that the Unit 2 SFP contributes Tritium to the Unit 1 groundwater flow regime via vadose zone transport (see the graphic representation in **Figure 6** herein and the discussion in the Hydrogeologic Site Investigation Report). It is noted that any decreasing Tritium trend in this area due to the termination of leaks from the Unit 2 SFP could be masked by increased leakage of Tritiated water from the Unit 1 SFPs up through the completion of defueling in November 2008, and then thereafter via the Retention Mechanism(s) and localized transient releases, as described above.

⁵⁸ MW-42 and MW-53 are located downgradient of the Unit 1 SFPs, rather than the Unit 2 SFP. However, these two wells were included in the analyses due to the long-standing hypothesis that the Unit 2 SFP contributes Tritium to the Unit 1 groundwater flow regime via vadose zone transport (see the graphic representation in **Figure 6** herein and the discussion in the Hydrogeologic Site Investigation Report). It is noted that any decreasing Tritium trend in this area due to the termination of leaks from the Unit 2 SFP could be masked by increased leakage of Tritiated water from the Unit 1 SFPs up through the completion of defueling in November 2008, and then thereafter via the Retention Mechanism(s) and localized transient releases, as described above.

⁵⁹ However, it is noted that the number of wells exhibiting a decreasing trend is decreasing (i.e., changing to a no-trend status). This issue is, in part, due to a shortcoming of the Mann Kendall analysis method, itself. This method only evaluates the number of increases relative to decreases, and does not weight the analysis relative to the magnitude of each change. Therefore, once a clearly decreasing trend, even of substantial magnitude, has reached a nearly horizontal asymptotic behavior, numerous insignificantly small positive and negative changes over time (such as due to sampling and hydrogeologic variability) can overwhelm

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approximately one-half (17) show a decreasing trend, as compared to 20 intervals last quarter. Slightly less than one-half (4) of the 9 river boundary monitoring intervals show a decreasing trend. It is important to note that this group of “decreasing wells” includes all those located within the core of the plume with the highest Tritium concentrations (MW-30-69, MW-33 and MW-111). These high-concentration wells better represent overall plume behavior because they encompass a great percentage of the Tritium activity in the plume.

Of the 13 non-river-boundary wells shaded in yellow (exhibiting “no-trend”), only 3 potentially provide valid representations (as shaded) of Unit 2 plume behavior pursuant to the Unit 2 SFP. The shading designation (in and of itself) for the others can no longer⁶⁰ be used to infer conclusions relative to overall plume trend as an indicator of Unit 2 SFP integrity based on this analysis, as follows:

- Three wells (MW-42-49, MW-42-78, and MW-53-82) are located downgradient of the Unit 1 SFPs, rather than the Unit 2 SFP.⁶¹ In addition, as discussed in **Section 3.4.4**, MW-53-82 appears to have been impacted by the more recent Unit 2 RWST/R.O. spill, as well as the prior U1 FSB valve leak.
- Inspection of the graph for MW-36-24 (**Figure G-7**) shows a rapid and large decrease in Tritium activity at early times in this overburden (discharge canal backfill) well (from > 30,000 pCi/L to <3,000 pCi/L). This large decrease is followed by a number of small perturbations around a relatively flat trend. While it is visually clear that this well has shown a major decrease in Tritium levels since containment of the 2005 shrinkage crack leak, the Mann–Kendall analysis only evaluates the number of increases relative to decreases and does not weight the analysis relative to the magnitude of each change. As such, visual inspection demonstrates that this location actually exhibits an overall decreasing trend, even though the analysis results in a no-trend designation (yellow shading on table). However, it is also noted that the last few quarters have shown what appear to be short-term, small peaks in the Tritium activity in this well, as likely associated with the transient Q1 2009 release from the U1 FSB distillation valves, the Q4 2009 RWST/R.O spill and/or the recent increases noted in MW-31 and MW-32.
- Inspection of the graph for MW-37-22 (**Figure G-8**) shows a similar historical trend as exhibited by MW-36-24, as discussed above. As such, the same conclusion has been reached for this well.

the early-time string of decreasing changes, thus resulting in a switch from a decreasing trend to a no-trend status. This is particularly true when a 95% confidence interval is applied. In addition, localized, transient Tritium surface spills have been shown to result in increases in activity, which, while valid measures of plume activity, impair the ability of the trend analysis to serve as a measure of plume attenuation due to successful SFP leak termination, the intended purpose of this analysis.

⁶⁰ While the Mann Kendall has many advantages for trend analysis where the number of data points is limited, it suffers from an inability to account for the magnitude of each change, only assessing the number of positive changes relative to negative changes. This shortcoming was inconsequential at early-times when large decreases in Tritium activity were observed in response to Entergy's termination of all of the identified leaks in the Unit 2 SFP. However, now that many of the graphs of Tritium activity vs time have nearly reached a horizontal asymptote, the accumulating number of small positive and negative changes is overwhelming the early-time string of decreasing changes, thus resulting in a switch from a decreasing trend to a no-trend status. In addition, localized, transient Tritium surface spills have impaired the ability of the trend analysis to serve as a measure of plume attenuation as related to SFP leak termination, the intended purpose of this analysis.

⁶¹ MW-42 and MW-53 are located downgradient of the Unit 1 SFPs, rather than the Unit 2 SFP. However, these two wells were included in the analyses due to the long-standing hypothesis that the Unit 2 SFP contributes Tritium to the Unit 1 groundwater flow regime via vadose zone transport (see the graphic representation in **Figure 6** herein and the discussion in the Hydrogeologic Site Investigation Report). It is noted that any decreasing Tritium trend in this area due to the termination of leaks from the Unit 2 SFP are more likely to be masked by increased leakage of Tritiated water from the Unit 1 SFPs up through the completion of defueling in November 2008, and then thereafter via the Retention Mechanism(s) and localized transient releases, as described above. This conclusion is based on their distance from The Unit 2 SFP and their proximity to the Unit 1 SFPs and the Unit 1 FSB distillation tank valve leak.

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- Inspection of the graph for MW-50-42 (**Figure G-11**) shows a similar historical trend as exhibited by MW-36-24 and MW-37-22, as discussed above. As such, the same conclusion has been reached for this well.
- Inspection of the graph for MW-55-24 (**Figure G-13**) shows a similar historical trend⁶² as exhibited by MW-36-24, MW-37-22 and MW-50-42, as discussed above. As such, the same conclusion has been reached for this well.
- Inspection of the graph for MW-32-149 (**Figure G-3**) shows a relatively well behaved decreasing trend in Tritium activity, starting at the beginning of the LTMP and continuing all the way until Q1 2010. Thereafter, a distinctly increasing trend began, as correlated with the Q4 2009 transient RWST/R.O. processing skid surface spill. As such, the shift from a decreasing trend to a no-trend result from the Mann Kendall analysis appears to most probably reflect the RWST/R.O spill and not a new leak in the Unit 2 SFP. Because this transient source has been terminated, the MW-32-149 Tritium activity will likely return to pre-spill levels, and it is anticipated that the Mann-Kendall analysis will eventually re-designate this well as “decreasing trend”, as it has been for all previous quarterly monitoring reports.
- Inspection of the graph for MW-32-85 (**Figure G-3**) shows a less well behaved but similar historical trend⁶³ as exhibited by MW-32-149, as discussed above. As such, the same conclusion has been reached for this well
- Inspection of the graph for MW-55-54 (**Figure G-13**) shows a similar historical trend⁶⁴ as exhibited by MW-32-149, as discussed above. As such, the same conclusion has been reached for this well.

Two of the three remaining “no-trend” wells comprise the shallowest sampling ports of two monitoring locations: MW-31, and MW-32. Additionally, the only two non-river boundary monitoring intervals designated with an increasing trend are also both located in the MW-31 monitoring installation. The MW-31 and MW-32 locations are actually not located downgradient of the Unit 2 SFP from a saturated groundwater flow standpoint. Rather, they are generally located up- and cross-gradient⁶⁵. The upper-most interval in MW-32 and all three intervals in MW-31 (including the lower two⁶⁶ which exhibit increasing trends) have shown clear peaks in Tritium levels over the last six quarters (Q1 2009 through Q2 2010) with somewhat less, but still noticeable variability evident all the way back to the beginning of monitoring. The current and historic variability in these data can be explained by either: 1) an ongoing small episodic (< 10L/day) leak in the Unit 2 SFP; 2) a “Retention Mechanism” in the saturated and

⁶² It is noted that MW-55-24 exhibits a similar trend to MW-36-24, except at very early times where it does not show as large a drop in Tritium activities.

⁶³ In addition to exhibiting the impact of the RWST/R.O. spill, MW-32-85 also appears to show a response consistent with the timing of the previous U1 FSB distillation valve leak. In addition, while the Mann Kendall analysis still shows a decreasing trend for MW-32-173, this monitoring interval exhibits behavior similar to MW-32-149 and MW-32-85 relative to their response to previous transient spills.

⁶⁴ While MW-55-54 exhibits a similar trend to MW-32-149, it is noted that there is a small, extended increase in Tritium activity over the middle of the graph, which is not seen in MW-32-149. This increase started prior to the documented localized, transient spills discussed above. As such, it is possible that this increase is associated with the coincident increase in Unit 2 SFP leak collection box flow rate during 2008 dry cask activities. This possible relationship is currently being investigated further.

⁶⁵ While not downgradient of the SFP from a groundwater flow perspective, Tritium leakage from the SFP can still migrate to these locations via vadose zone transport above the water table along dipping bedrock fractures. During the site investigation work, a tracer test was performed which clearly demonstrated that water released proximate to the SFP foundations (adjacent to MW-30) does migrate to the east and south past MW-31 and MW-32 prior to entering the water table, and then flows with the groundwater through these wells and then to the river to the west. This vadose zone migration mechanism is discussed more fully in the Hydrogeologic Site Investigation Report.

⁶⁶ It is noted that while these two intervals are the lowest in the MW-31 monitoring installation, they are both much shallower than the deeper intervals in the MW-32 installation.

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unsaturated zones under the SFP that can retain substantial volumes of highly Tritiated water (e.g., historic SFP leakage) for substantial amounts of time⁶⁷; 3) localized, transient releases⁶⁸ and/or 4) a combination of the above. While Tritium concentrations in the groundwater plume could be impacted by both an ongoing leak and the Retention Mechanisms cited above, tracer concentrations in the groundwater cannot be replenished by SFP leakage. As discussed in further detail in Section 3.6 of the Q1 2009 Quarterly Monitoring Report, the original and updated tracer data strongly support the existence of a Retention Mechanism. In addition, it would be expected that Tritium release from the Retention Mechanisms would be episodic, for example as associated with periods of increased infiltration from precipitation. Such episodic releases would be expected to result in the peaks in Tritium concentrations observed. However, it is also becoming increasingly evident that relatively recent localized, transient spills are also contributing to the observed peaks in Tritium activity.

The third remaining interval reported as "no-trend", MW-30-84, is located immediately next to the SFP and generally downgradient of MW-31-63 and MW-31-85 (intervals with increasing trend). While the Mann Kendall analysis yields no trend for this interval over the full monitoring time frame, the interval actually exhibits a distinctly increasing trend beginning in the late fall of 2008. The specific reason for this increase is not known, but it is worth noting that the Tritium activity in this interval is approximately an order of magnitude below that measured in upgradient well MW-31-63 (as well as MW-31-85, both of which are exhibiting increasing trends). As such, the increasing trend in MW-30-84 could be a response to infiltration of this higher activity water over time. In addition, there are also peaks in the Tritium over time data for MW-30-84 which are consistent with the timing of the above discussed localized, transient surface spills. Finally, the beginning of the general increasing trend in Tritium activity in this well appears to predate the identified localized spills, and is coincident with the increase in Unit 2 SFP leak collection box flow rate during 2008 dry cask operations. This possible relationship is currently being investigated further.

Of the seven depth intervals in MW-67, three show no trend and three exhibit a decreasing trend (relative to only two decreasing trend intervals in Q1 2010 Quarterly Monitoring Report), using the Mann Kendall analysis (**Figure G-16**). However, it is critical to note that two of the three wells showing the decreasing trend are those with the highest Tritium activities (MW-67-39 and MW-67-105); activities two to four times those in the no trend wells⁶⁹. In addition, the no trend wells all have maximum Tritium activities less than 1500 pCi/L. Finally, the depth interval that shows an increasing trend (MW-67-340) is also the well with the lowest Tritium activities of all 7 intervals; it is further noted that the maximum activity measured in this interval is well below 1,000 pCi/L. It is also important to recognize that MW-67 was installed and first sampled in late 2007, well after the majority of the Unit 2 Tritium activity reduction occurred (2005 through early 2007, as exhibited by the upgradient wells). Therefore, what may have been decreasing trends in these "no trend wells", cannot be reconstructed with the available limited late-time data sets. It is currently GZA's opinion that the no and increasing trend wells in MW-67 should continue to be monitored, but the data and trend analyses that they currently provide via the Mann Kendall

⁶⁷ This hypothesized "Retention Mechanism" is supported by our understanding of the construction methods used for the IP2-SFP and adjacent structures, evaluations of contaminant concentration variability trends over short timeframes and precipitation events, as well as the original and subsequent tracer test results, as further described in Sections 7.0 and 8.0 of the Hydrologic Site Investigation Report and the Q1 2009 monitoring report.

⁶⁸ That is, any other leak or spill above the upgradient portions of the Unit 2 Tritium plume (such as the previous distillate tank valve leak first discussed in the Q1 2009 Quarterly Report and the more recent RWST/R.O. processing skid spill discussed in **Section 3.4** above). While relatively infrequent and transient, these spills of radionuclides into the subsurface clearly further complicate the analyses and evaluation of long term trends as used to verify the cessation of Unit 2 SFP leakage. The impact of these releases are also becoming increasingly difficult to separate from impacts associated with the storage /Retention Mechanism(s) to which these releases also contribute. To the extent possible, these transient releases have been accounted for in the previous discussions and analyses.

⁶⁹ It is also noted that all three monitoring intervals exhibiting decreasing trends are the shallowest sampling intervals within MW-67.

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analysis method should be of no current concern. A similar analysis and conclusions apply to the two depth intervals in MW-66 (see **Figure G-15**).

Based on the evaluation summarized above, the Mann-Kendall analyses of the individual depth intervals within the groundwater monitoring installations located proximate to and downgradient of the Unit 2 SFP previously have overwhelmingly supported a conclusion that the Tritium plume has exhibited an overall decreasing trend with time since monitoring began. This conclusion was clear at early-times when large decreases in Tritium activity were observed in response to Entergy's termination of all of the identified leaks in the Unit 2 SFP. However, now that many of the graphs of Tritium activity vs time have reached a horizontal asymptote, the accumulating number of small positive and negative changes is overwhelming the early-time string of decreasing changes, thus resulting in a switch from a decreasing trend to a no-trend status. In addition, localized, transient Tritium spills have impaired the ability of the trend analysis to serve as a measure of plume attenuation as related to SFP leak termination, the intended purpose of this analysis. Therefore, identification of another, more appropriate method is being investigated, particularly as the total LTMP data set becomes more robust with time. It is also important to note that the increases in Tritium activity measured in the monitoring wells have been readily explained by localized, transient surface spills which are unrelated to the Unit 2 SFP. As such, there is still currently no definitive evidence of new, unidentified leaks from the monitored Systems, Structures, or Components, including the Unit 2 SFP.

Tritium Plume Total Activity Analysis

As discussed above, the individual well trend data, when viewed collectively, support a conclusion that the Tritium plume concentrations have generally been decreasing with time since monitoring began. Another method to analyze plume behavior is to compute the total Tritium activity in the plume at multiple snapshots over time. This procedure⁷⁰ was implemented for each quarterly LTMP sampling round from Q2 2007 to Q2 2010. In addition, the bounding Tritium concentrations from Figure 8.1 of the Hydrogeologic Site Investigation Report⁷¹ have also been included as a starting point for the graph. These data are summarized as a histogram on **Figure G-17** in **Appendix G**.

As can be seen from the figure, the total Tritium activity in the plume downgradient of the Unit 2 SFP has shown a distinctly decreasing trend over time. However, a noticeable increase in total Tritium mass (from a low of 0.016 Ci to a current value of 0.021 Ci) was calculated during this quarter (Q2 2010). Approximately 70% of the sampling intervals used in the total Unit 2 Tritium activity calculations recorded an increase in Tritium activity from Q1 2010 to Q2 2010⁷². Similar to the increase in Unit 2 I.L. exceedances, this overall activity increase was likely caused by the transient surface spill related to the RWST/R.O. processing skid operations. As such, the increase in total Tritium activity is likely to be transient in nature, as was the surface spill. However, even accounting for this current peak, the total Tritium activity in the plume has still decreased 28 percent since Q2 2007, and has decreased by 86 percent when compared to the bounding level Tritium concentrations. In addition, it is noted that prior to the current, and assumed transient, perturbation in the overall downward trend in **Figure G-17**, the time/activity

⁷⁰ The individual sampling point Tritium concentrations were multiplied by the groundwater volumes in representative zones (discretized over area and depth), as computed using soil and bedrock effective porosities developed from the pumping and tracer tests (see the Hydrogeologic Site Investigation Report for further information).

⁷¹ Hydrogeologic Site Investigation Report, January 7, 2008, prepared by GZA GeoEnvironmental, Inc, on behalf of Enercon Services, Inc., for Entergy Nuclear Northeast, Indian Point Energy Center, 450 Broadway, Buchanan, NY 10511.

⁷² It should be noted that an increase in Tritium activity for sampling locations completed in soil (backfill) have greater impacts on the total Tritium mass calculations due to difference in overburden porosity vs. bedrock porosity.

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data appear to be approaching a non-zero horizontal asymptote⁷³. While the general “first order” plume decay is what would be expected for a plume undergoing Monitored Natural Attenuation after source termination, a non-zero asymptote suggests a continued input of Tritium into the groundwater flow regime. The data currently available lead us to believe this continuing Tritium input is likely associated with the Retention Mechanism(s) and/or localized transient releases, as described in this and earlier reports.

Conclusion- Unit 2 Tritium Plume MNA

Based on the data and analyses provided above, our conclusion is that the Tritium plume associated with the historic Unit 2 SFP leaks is undergoing overall, long-term reductions in activity which are consistent with Monitored Natural Attenuation (MNA), the remedial technology selected for the IPEC Site. Given this conclusion and the recognition that Entergy has terminated all identified leaks in the Unit 2 SFP, this Unit 2 Tritium plume satisfies the requirements for Monitored Natural Attenuation⁷⁴. Further justification for this conclusion can be found in Section 3.6 of the Q1 2009 Quarterly Monitoring Report as well as the Hydrogeologic Site Investigation Report.

Finally, it is important to recognize that even with the somewhat increased Tritium levels currently observed due to the Unit 2 RWST/R.O. skid transient surface spill, the amount of tritium being released through the groundwater pathway is still small compared to permitted levels of Tritium discharge to the river through the Discharge Canal.

3.5.2 Unit 1 Strontium Plume Attenuation

Despite the effects of partitioning, as discussed above, the overall Strontium activity within the Unit 1 plume had generally shown some attenuation in response to the West Pool demineralization conducted by Entergy in preparation for defueling. This work began in 2006 and resulted in an approximately 98% reduction in Strontium in the West Pool (see **Figure 7A**: U1-NCD, U1-SFDS, MW-42, U1-CSS). However, the final defueling of the Unit 1 SFPs had resulted in a noticeable increase in Strontium levels proximate to the SFPs (U1-NCD, U1-SFDS, MW-42, and U1-CSS; all of which have shown large sustained decreases since mid 2009 to pre-defueling levels). Farther downgradient (MW-53, MW-55, MW-54, MW-57, MW-50, and MW-37), increases in the Strontium plume activities were also measured, but generally after a time lag as compared to wells more proximate to the SFPs. The majority of these more downgradient monitoring locations have most recently shown decreases approaching pre-defueling levels. The farthest downgradient, river boundary wells (MW-67 and MW-62) have possibly shown Strontium activity increases in the past few quarterly sampling events. This increase, followed by a longer term decrease, is as was predicted given the requirement to temporarily raise the pool levels for fuel rod removal, thus increasing the leakage rate from the SFPs prior to fully draining the pool⁷⁵.

The data for Q2 2010 indicate that the overall Strontium levels continued to exhibit a general decrease and have now reached pre-defueling levels in the immediate vicinity of the pool

⁷³ One physical cause for a horizontal asymptote would include a persistent, unidentified leak still remaining in the Unit 2 SFP. With Tritium at approximately 30,000,000 pCi/L in the SFP, a leak directly from the pool of only approximately 10 L/day would be sufficient to provide the required Tritium input to the groundwater. However, the available data do not appear to support the existence of such a leak. The rationale underlying this conclusion is discussed more fully in Section 3.6 of the Q1 2009 Quarterly Monitoring Report. This conclusion will continue to be reassessed as new data becomes available, particularly that associated with the collection box.

⁷⁴ It is noted that the previously clear attenuation of the Unit 2 tritium plume has been confounded by a number of localized, transient surface spills. Entergy is currently in the process of reviewing and addressing work practices which may have contributed to the occurrence of these spills.

⁷⁵ As of late 2008, all the fuel rods have been removed from the Unit 1 SFPs and the pool water has been drained. As such, the Unit 1 SFPs is no longer an active source of radionuclides to the subsurface.

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(U1-NCD, MW-42, U1-SFDS, U1-CSS and MW-53⁷⁶). These monitoring locations would be expected to be the first to reflect the complete decommissioning of the SFPs given their location/function. Somewhat farther downgradient, the Q2 2010 data are consistent with the “tail” portion of the perturbation as the previous increase in U1-SFPs leakage works its way towards the river. This behavior is most evident at monitoring locations MW-37, MW-50, MW-55 and MW-57⁷⁷ where, for the most part, the maximum Strontium levels were recorded in 2009 and have decreased over the past few quarters, approaching pre-defueling activities. MW-54, however, appeared to have already exhibited a Strontium peak in Q4 2008, and then decreased back to previous levels, even though this monitoring installation is relatively far downgradient. This behavior serves to again emphasize that the IPEC Site is located in a bedrock fracture controlled hydrologic regime⁷⁸. As such, this type of localized “distance-based inconsistency” is to be expected and likely indicates that these wells are closer to (or within) the more pervious preferential flow pathway that is hypothesized to be responsible for the convergence and narrowing of the Tritium and Strontium plumes as they move toward the river from sources centered at widely spaced locations upgradient⁷⁹.

Farther downgradient, in the vicinity of the river, increases in Strontium activity in MW-62 may be reflective of the Unit 1 SFPs defueling operations. The MW-62-138 depth interval (along with, but to a lesser extent the shallower intervals in overburden) appears to show two distinct Strontium peaks in Q1 2009 and Q4 2009⁸⁰. However, it is noted that the Strontium levels in this monitoring installation are all relatively low (below 3pCi/l), and this location does not appear to be proximate to (or within) the preferential flow path cited above for the Strontium plume. Therefore, the peaks in Strontium observed may not be associated with the Unit 1 defueling, and may be due to nothing more than hydrogeological variability. The other riverfront monitoring installation downgradient of the unit 1 Strontium plume, MW-67, may also be exhibiting impacts from the Unit 1 SFPs defueling. The shallowest depth interval, MW-67-39 has shown a moderate increase in Strontium levels in Q4 2009 followed by slight decreases in Q1 2010 and Q2 2010 (trends consistent with “tailing off” portion of an adsorbing radionuclide) after an overall, clear decreasing trend since October 2007.

From an overall, long-term perspective, Strontium levels downgradient of the Unit 1 SFPs are generally behaving as expected. The monitoring installations closest to the SFPs (e.g., U1-NCD, MW-42, U1-CSS and U1-SFDS) exhibited strong peaks in Strontium activity in response to defueling, and then have decreased to pre-defueling levels. Monitoring installations farther downgradient are generally showing decreases in Strontium activity over the past three quarterly sampling rounds and are approaching pre-defueling levels (e.g., MW-37, MW-55, and MW-57). It is expected that Strontium activities in these wells will continue to decrease to pre-

⁷⁶ While the Q1 2010 data were somewhat higher in MW-53-82 and MW-53-120, the Q2 2010 data show a decrease to approximate pre-defueling levels. This potential Strontium peak may be due to the transient surface spill associated with Unit 2 RWST/R.O. processing skid activities.

⁷⁷ Based on Q2 2010 data; both sampling intervals in this monitoring location have approximately reached pre-defueling Strontium levels.

⁷⁸ While groundwater flow through the fractured bedrock at the IPEC Site is highly preferential at small areal scales, it is characterized by sufficiently interconnected small bedrock fractures to allow the hydrogeologic system to function and be modeled as a non-homogeneous, anisotropic, porous media at Site-wide scales.

⁷⁹ By way of contrast, in a porous media flow regime, the centerlines of plumes that start at widely spaced locations (spaced perpendicular to the groundwater flow path) will typically remain widely spaced (although the edges of the plumes will likely move closer as the plumes get wider through dispersion). In the case of fracture flow at IPEC however, not only do the Strontium and Tritium plume centerlines converge, but the plumes also get narrower as they move downgradient. In addition, MW-50 displays high relative Strontium concentrations and fault gouge was encountered during the drilling of this well. These behaviors/data are hallmark signatures of a more highly fractured zone preferentially controlling groundwater flow and thus the migration of the contaminants therein (see the Site Hydrologic Investigation Report for further CSM-focused discussion of this issue).

⁸⁰ The increase in Q1 2009 in MW-62-138 was followed by a steady decrease over the next two quarterly monitoring events, and the peak in Q4 2009 was followed by a greater magnitude decrease in Q1 2010; the Q2 2010 Strontium activity slightly increased compared to Q1 2010.

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defueling levels. Monitoring installations closer to the river may still show Strontium increases as the additional leakage experienced during defueling flushes through the groundwater flow system. It is expected that completion of this flushing mechanism will be protracted given the aforementioned impact of partitioning on Strontium levels in the groundwater. However, over time it is expected that downgradient Strontium plume levels will also continue their overall downward trend once this perturbation has fully passed through the system; decreasing trends are expected and predicted given that Entergy has terminated all leaks in the Unit 1 SFPs through decommissioning and the Unit 1 Strontium plume continues to decrease in accord with Monitored Natural Attenuation. Given this conclusion and the recognition that Entergy has terminated all identified leaks in the Unit 1 SFPs through decommissioning, the Unit 1 Strontium plume satisfies the requirements for Monitored Natural Attenuation.



4.0 CONCLUSIONS AND PLANNED FUTURE WORK

Given the data collected to date, the apparent strength of the CSM to evaluate those data, and the completion of source interdictions by Entergy, we believe all Program Objectives (see **Section 3.0**) are being met. These objectives are consistent with and fully encompass the guidance provided in the NEI Groundwater Protection Initiative (GPI).

Based on the specific results and evaluation of the Q2 2010 groundwater monitoring within the context of the Long Term Monitoring Program, IPEC plans to continue routine groundwater sampling and related maintenance. This work will be conducted in accordance with the IPEC Radiological Groundwater Monitoring Program IP-SMM-CY-110, and will incorporate the enhancements described herein.

More specifically, evaluation of data collected during Q2 2010 has shown the following:

- While I.L.s have been met at a number of upgradient Unit 2 locations this quarter, there is no compelling evidence of new, unidentified leaks from the monitored Systems, Structures, or Components. The Q2 2010 and/or Post-Q2 2010 I.L. exceedances in multiple MW-31 and MW-32 sampling intervals (MW-31-63, MW-32-59, MW-32-149, and MW-32-173), as well as MW-36-24, MW-50-42, and MW-53-82 have been attributed to a localized, transient surface spill associated with operation of a Unit 2 RWST/R.O. processing skid during Q4 2009 (see **Section 3.4.5**). Given that this Tritium release was eliminated, it is expected that the Tritium activities will decrease to pre-spill levels; although future releases from the storage/Retention Mechanism(s), replenished by these spills and historic SFP leaks, could create additional perturbations in Tritium levels.
- Previously identified, more historic transient leaks included: the additional leakage from the Unit 1 SFPs during the 2008 defueling operations, the transient leakage from the distillation tank valves in Q1 2009, and the transient surficial Tritium release to Unit 3 Manhole A2 in Q2 2009:
 - Based on past work, additional leakage was expected during the raising of water levels in the Unit 1 SFPs for final fuel removal to ISFSI storage. Unit 1 SFPs leakage was terminated with the drainage and sealing of the pools. This previous, transient leakage was initially verified as pronounced increases in Strontium and Cesium in the monitoring locations closest to Unit 1, and continues to be monitored.
 - The Q1 2009 leakage from the distillation tank valves was independently⁸¹ identified based on an increase in Tritium levels in monitoring installation MW-42 proximate to the tanks, and subsequent increases in downgradient wells (MW-53-82, U1-CSS, and MW-50-42). These valves were immediately repaired and the leakage was terminated. Based on the observed data trends, it appears that the Tritium input into the groundwater flow regime from the waste distillation tank valving leak has generally dissipated through the system⁸². However, the potential impact of this

⁸¹ The valve leakage was initially identified during routine visual inspection rounds and immediately terminated. Given that the leak was within the Unit 1 FSB structure, it was documented in a Condition Report under Entergy's Corrective Action Program. This valve leak and repair subsequently came to light within the GPI program during investigations into the cause of the abrupt increase in Tritium levels in MW-42. Additional emphasis has therefore been placed on routine review of these reports as they potentially relate to GPI objectives.

⁸² Additional portions of these releases likely remain above the water table in the release area as recharge to the various Retention Mechanisms. This additional unsaturated zone source recharge will likely be manifested in the future as additional non-specific peaks in radionuclide levels due to episodic releases to the groundwater flow regime from these mechanisms (e.g., from intense/prolonged precipitation events).

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release further downgradient will be specifically scrutinized during subsequent monitoring rounds.

- Elevated Tritium activity was detected in Unit 3 Manhole A2 during routine 80-10 Effluents Program sampling during Q2 2009. This manhole is located proximate to the Unit 3 FSB. Subsequent re-sampling of this manhole showed rapidly decreasing Tritium activity, indicating that this was a one-time transient event. This elevated Tritium was also detected in a proximate groundwater monitoring installation (MW-45), likely due to exfiltration of Tritium from the manhole. As of this quarter (Q2 2010) the Tritium levels in this well have returned to previous levels for three consecutive quarters. While the specific root source of the elevated Tritium is still unclear at this time, Entergy has formulated a plan to investigate a suspected SFP seasonal airborne vapor depositional source.

As such, these data support the validity of the current CSM for use as a basis for Long Term Monitoring Program design. It is further noted that, while a portion of the above four documented localized leakage events traveled directly to the saturated groundwater regime and resulted in the observed transient “peaks” in radionuclide levels, additional portions of these releases likely remain above the water table as recharge to the various Retention Mechanisms. This additional unsaturated zone source recharge will likely be manifested in the future as additional non-specific peaks in radionuclide levels due to episodic releases to the groundwater flow regime from these mechanisms (e.g., from intense/prolonged precipitation events).

- While the current Tritium I.L. levels proved helpful both last quarter and this quarter (Q1 and Q2 2010) in identifying a localized, transient surface spill associated with Unit 2 RWST/R.O. operations, data collected during previous quarters and possibly the U3-4D I.L. exceedance this quarter (Q2 2010) have generally demonstrated that the I.L.s originally established are somewhat too sensitive relative to natural seasonal/precipitation-driven transient variations in radionuclide activities, as well as the variability inherent in the laboratory analyses. Relative to Strontium from the Unit 1 SFPs, the previous increases in activity in a number of monitoring points, due to the previous Unit 1 defueling operations, limit our ability to establish Strontium baseline levels for assessment of new I.L.s pursuant to the Monitored Natural Attenuation (MNA) of this plume. It is anticipated that this additional Strontium activity will take a number of quarters to completely flush through the onsite groundwater flow system and attenuate to reasonably stable levels. As such, the originally established I.L.s for both Tritium and Strontium will continue to be used until sufficient data is collected to allow re-evaluation of I.L. levels for the radionuclides of interest.
- From both qualitative and quantitative perspectives, the overall quarterly monitoring data set supports the conclusion that the overall Tritium activity in the Unit 2 plume has been decreasing. These overall reductions have become particularly evident on the more recent quarterly report **Figures 6 and 6A** where the shaded plume⁸³ no longer extends to the river, as it did prior to Q2 2009. It is further visually evident from **Figure 6A** that the core of the plume (with quarterly rolling average activities greater than 100,000 pCi/L

⁸³ The plume shading on **Figure 6** demarks the estimated boundary that separates Tritium levels greater than 5,000 pCi/L from those below this value. This plume delineation boundary value equates to one-quarter of the drinking water standard for Tritium. Although GZA emphasizes that drinking water standards (USEPA MCLs) do not apply to the IPEC property given that there are no drinking water sources on or proximate to the site, the MCLs do provide a useful benchmark for comparisons of relative human risk. Where yearly rolling average radionuclide activity data were available for multiple depths at a given location, GZA used the highest value to develop plume delineations. This is a typical approach to represent three-dimensional contaminant data sets on two-dimensional maps.

Section 4.0 Conclusions and Planned Activities

and 2007 bounding core activities greater than 250,000 pCi/L) has also shown a marked decrease in activity and extent. Based on the data and analyses provided above, our conclusion is that the Tritium plume associated with the historic leaks in the Unit 2 SFP is undergoing long-term, overall reductions in activity which are consistent with Monitored Natural Attenuation (MNA), the remedial technology selected for the IPEC Site⁸⁴. Given this conclusion, and the recognition that Entergy has terminated all identified leaks in the Unit 2 SFP⁸⁵, this Unit 2 Tritium plume satisfies the requirements for Monitored Natural Attenuation.

- The overall Strontium activity within the Unit 1 plume had generally been stable or decreasing in response to West Pool demineralization conducted by Entergy beginning in 2006. However, the final defueling of the Unit 1 SFPs resulted in an initial, noticeable increase, followed by a subsequent and commensurate decrease, in Strontium levels proximate to the SFPs, with later increases in the downgradient Strontium levels (see **Figure 7 and 7A**). This is as was predicted given the requirement to temporarily raise the pool levels for rod removal, thus increasing leakage rate from the SFPs⁸⁶. As anticipated, the levels proximate to the pool have decreased to pre-defueling Strontium levels, and levels downgradient of the pool are showing continued decreases as this additional Strontium-contaminated water flushes through the groundwater flow system. It is expected that this flushing mechanism will be protracted given the aforementioned impact of partitioning on Strontium levels in the groundwater. However, over time it is expected that downgradient Strontium plume levels will also achieve an overall downward trend below pre-defueling levels once this perturbation is finished passing through the system. Given this conclusion and the recognition that Entergy has terminated all identified leaks in the Unit 1 SFPs through decommissioning, the Unit 1 Strontium plume satisfies the requirements for Monitored Natural Attenuation. However, as indicated above, the establishment of updated I.L.s for the Unit 1 Strontium plume must await return to the original Strontium baseline levels existing prior to Unit 1 defueling.
- The amount of radionuclides being released through the groundwater pathway, even with the somewhat increased Tritium levels currently observed due to the Unit 2 RWST/R.O. skid transient surface spill, is still small compared to permitted levels of Tritium discharge to the river through the Discharge Canal.

⁸⁴ It is noted that the previously clear attenuation of the Unit 2 tritium plume has been confounded by a number of localized, transient surface spills. Entergy is currently in the process of reviewing and addressing work practices which may have contributed to the occurrence of these spills.

⁸⁵ Further justification for this conclusion can be found in Section 3.6 of the Q1 2009 Quarterly Monitoring Report as well as the Hydrogeologic Site Investigation Report. The Q1 2009 Report summarizes additional, more quantitative analyses which were completed to further investigate the integrity of the Unit 2 SFP. These analyses provide further support for the original conclusion that the Unit 2 SFP is no longer leaking. However, given the more recent behavior observed in the Unit 2 collection box data (see Section 3.6 of the Q1 2009 Long Term Monitoring Report), additional investigations/data evaluations are underway to further rule out potential Unit 2 SFP leak mechanisms. In this regard, it is noted that these analyses cannot definitively and completely rule out the possibility of a remaining small leak which could then also be supplying Tritium to the groundwater flow regime in addition to the Retention Mechanism(s) and surface spill from the process skid discussed above. While it is not possible to quantify the size the minimum detectable leak with any degree of certainty, we believe that the maximum leak rate from the Unit 2 SFP that could potentially remain undetected by the groundwater monitoring system is less than 10 to 30 gpd (0.007 to 0.021 gallons per minute). It is also likely that if a small leak exists in the Unit 2 SFP liner, it should not get worse with time, as based on liner evaluations previously conducted by Entergy. It is further emphasized that while a leak of greater than 0.02 gallons per minute should be large enough to be readily detectable with the existing Long Term Monitoring Program, this amount of Tritium release to the river is still small compared to permitted levels of Tritium discharge to the river through the Discharge Canal.

⁸⁶ As of late 2008, all the fuel rods have been removed from the Unit 1 SFPs and the pool water has been drained. As such, the Unit 1 SFPs is no longer an active source of radionuclides to the subsurface.



TABLES

Table 1 Groundwater Sampling Methods, Equipment, Frequency, and Depths

Table 2 Historic Quarterly Low Tide Groundwater Elevations

Table 3 2010 2nd Groundwater Analytical Results and Averages

Table 4 2010 2nd Quarter Groundwater Analytical Results and I.L.s

Table 5 Historic Groundwater Analytical Results

TABLE 1
GROUNDWATER SAMPLING METHODS, EQUIPMENT, FREQUENCY AND DEPTHS
INDIAN POINT ENERGY CENTER
BUCHANAN, NY

Well ID ¹	Sampling Method	Sampling Equipment Used	Projected 2010 Sampling Frequency ²	SAMPLING INTERVAL ³				SAMPLING DEPTH ⁴	
				FT Below Top of Casing		Elevation in Feet msl		Feet Below TOC	Elevation in Feet msl
				Top	Bottom	Top	Bottom		
MW-30-69	Waterloo Low Flow	Waterloo Multilevel System	Quarterly	67.3	71.3	8.4	4.4	69.3	6.4
MW-30-84	Waterloo Low Flow	Waterloo Multilevel System	Quarterly	77.3	85.4	-1.6	-9.5	83.8	-8.1
MW-31-19	Waterloo Low Flow	Waterloo Multilevel System	Quarterly	31.8	49.3	40.8	26.3	48.8	26.8
MW-31-63	Waterloo Low Flow	Waterloo Multilevel System	Quarterly	57.3	63.8	20.3	11.8	63.3	12.3
MW-31-85	Waterloo Low Flow	Waterloo Multilevel System	Quarterly	69.8	85.4	5.8	-9.6	84.8	-9.2
MW-32-59	Waterloo Low Flow	Waterloo Multilevel System	Quarterly	28.3	61.3	48.8	15.8	58.8	18.3
MW-32-85	Waterloo Low Flow	Waterloo Multilevel System	Quarterly	79.3	92.8	-2.2	-15.7	85.3	-8.3
MW-32-131	Waterloo Low Flow	Waterloo Multilevel System	Inactive	125.8	138.3	-48.7	-61.2	130.8	-53.7
MW-32-149	Waterloo Low Flow	Waterloo Multilevel System	Quarterly	125.8	156.8	-70.2	-79.7	149.3	-72.2
MW-32-173	Waterloo Low Flow	Waterloo Multilevel System	Quarterly	165.8	174.3	-88.7	-97.2	172.8	-95.7
MW-32-190	Waterloo Low Flow	Waterloo Multilevel System	Quarterly	180.3	193.9	-103.2	-116.8	190.3	-113.7
MW-33	Low Flow	Peristaltic Pump	Annually	8.0	30.0	10.6	-11.7	16	2.8
MW-34	Low Flow	Peristaltic Pump	Inactive	5.0	30.0	13.5	-11.5	16.5	2.0
MW-35	Low Flow	Peristaltic Pump	Annually	6.5	30.0	12.1	-11.4	15.0	3.6
MW-36-24 ⁵	Low Flow	Peristaltic Pump	Quarterly	11.0	24.0	0.8	-12.2	17.0	-5.2
MW-36-41	Modified Well Vol. Purge	Peristaltic Pump	Inactive	36.0	41.0	-24.2	-29.2	37.0	-25.2
MW-36-52	Modified Well Vol. Purge	Peristaltic Pump	Quarterly	48.0	53.0	-36.2	-41.2	50.0	-38.2
MW-37-22	Low Flow	Peristaltic Pump	Quarterly	12.0	22.0	3.0	-7.0	17.0	-2.0
MW-37-32	Low Flow	Peristaltic Pump	Quarterly	28.0	32.5	-13.0	-17.5	29.0	-14.0
MW-37-40	Modified Well Vol. Purge	Peristaltic Pump	Quarterly	38.5	40.5	-23.5	-24.5	39.0	-24.0
MW-37-57	Low Flow	Peristaltic Pump	Quarterly	52.0	57.0	-37.0	-42.0	55.0	-40.0
MW-38	Low Flow	Peristaltic Pump	Inactive	5.0	40.0	9.3	-25.7	25.4	-11.1
MW-39-67	Waterloo Low Flow	Waterloo Multilevel System	Semi-Annually	65.0	70.5	15.0	9.5	67.0	13.0
MW-39-84	Waterloo Low Flow	Waterloo Multilevel System	Semi-Annually	76.5	85.0	3.5	-5.0	83.5	-3.5
MW-39-102	Waterloo Low Flow	Waterloo Multilevel System	Semi-Annually	95.0	103.0	-13.0	-23.0	101.5	-21.5
MW-39-124	Waterloo Low Flow	Waterloo Multilevel System	Semi-Annually	115.0	126.5	-35.0	-46.5	124.0	-44.0
MW-39-183	Waterloo Low Flow	Waterloo Multilevel System	Semi-Annually	169.5	186.0	-89.5	-106.0	182.5	-102.5
MW-39-195	Waterloo Low Flow	Waterloo Multilevel System	Semi-Annually	193.0	198.6	-113.0	-118.4	195.0	-115.0
MW-40-27	Waterloo Low Flow	Waterloo Multilevel System	Quarterly	18.2	35.2	55.0	38.0	26.7	46.5
MW-40-46	Waterloo Low Flow	Waterloo Multilevel System	Quarterly	44.2	53.7	29.0	19.5	46.2	27.0
MW-40-81	Waterloo Low Flow	Waterloo Multilevel System	Quarterly	64.7	84.2	8.5	-11.0	80.7	-7.5
MW-40-100	Waterloo Low Flow	Waterloo Multilevel System	Quarterly	93.2	106.7	-20.0	-33.5	100.2	-27.0
MW-40-127	Waterloo Low Flow	Waterloo Multilevel System	Quarterly	125.2	136.7	-52.0	-63.5	127.2	-54.0
MW-40-162	Waterloo Low Flow	Waterloo Multilevel System	Quarterly	158.7	190.3	-85.5	-116.9	161.7	-88.5
MW-41-40	Low Flow	Peristaltic Pump	Quarterly	22.0	42.0	32.9	12.9	36.0	18.9
MW-41-63	Modified Well Vol. Purge	Water Pump	Quarterly	59.0	64.0	-4.1	-9.1	61.0	-6.1
MW-42-49	Low Flow	Bladder Pump	Quarterly	31.0	51.0	38.7	18.7	41.0	28.7
MW-42-78	Modified Well Vol. Purge	Water Pump	Quarterly	69.0	79.0	0.7	-9.3	74.0	-4.3
MW-43-28	Low Flow	Bladder Pump	Quarterly	8.0	28.0	40.8	20.7	23.0	25.8
MW-43-62	Low Flow	Bladder Pump	Quarterly	42.0	62.0	6.8	-13.2	54.0	-5.2
MW-44-66	Modified Well Vol. Purge	Bladder Pump	Quarterly	52.0	67.0	11.5	26.5	63.0	30.5
MW-44-102	Modified Well Vol. Purge	Water Pump	Quarterly	79.0	104.0	14.5	-10.5	80.0	13.5
MW-45-42	Modified Well Vol. Purge	Bladder Pump	Quarterly	27.5	42.5	26.2	11.2	37.0	16.0
MW-45-61	Modified Well Vol. Purge	Water Pump	Quarterly	51.5	61.5	2.2	-7.8	58.0	-4.4
MW-46	Modified Well Vol. Purge	Peristaltic Pump	Quarterly	6.0	30.0	12.1	-11.9	10.5	7.6
MW-47-56	Low Flow	Submersible Pump	Inactive	36.0	56.0	34.3	14.3	52.0	18.3
MW-47-80	Modified Well Vol. Purge	Water Pump	Inactive	70.0	80.0	0.3	-9.7	72.0	-1.7

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FINAL Q2Table1.xls;
Methods, Frequency, Depths

TABLE 1
GROUNDWATER SAMPLING METHODS, EQUIPMENT, FREQUENCY AND DEPTHS
INDIAN POINT ENERGY CENTER
BUCHANAN, NY

Well ID ¹	Sampling Method	Sampling Equipment Used	Projected 2010 Sampling Frequency ²	SAMPLING INTERVAL ³				SAMPLING DEPTH ⁴	
				FT Below Top of Casing		Elevation in Feet msl		Feet Below TOC	Elevation in Feet msl
				Top	Bottom	Top	Bottom		
MW-48-23	Low Flow	Peristaltic Pump	Inactive	8.0	23.0	7.4	-7.6	15.8	-0.4
MW-48-37	Low Flow	Peristaltic Pump	Inactive	33.0	38.0	-17.6	22.6	35.8	-20.4
MW-49-26	Low Flow	Peristaltic Pump	Quarterly	15.0	25.0	-0.3	-10.4	20.0	-5.3
MW-49-42	Low Flow	Peristaltic Pump	Quarterly	3.0	42.0	-17.4	-27.4	37.0	-22.3
MW-49-65	Low Flow	Peristaltic Pump	Quarterly	60.0	65.0	-45.4	-50.4	61.0	-46.4
MW-50-42	Low Flow	Peristaltic Pump	Quarterly	22.0	42.0	-7.1	-27.1	27.0	-12.1
MW-50-66	Low Flow	Peristaltic Pump	Quarterly	62.0	67.0	-47.1	-52.1	60.0	-45.1
MW-51-10	Waterloo Low Flow	Waterloo Multilevel System	Quarterly	29.7	41.2	38.0	23.5	39.7	28.0
MW-51-79	Waterloo Low Flow	Waterloo Multilevel System	Quarterly	63.2	81.2	4.5	-13.5	78.7	-11.0
MW-51-104	Waterloo Low Flow	Waterloo Multilevel System	Quarterly	101.2	111.2	-33.5	-43.5	103.7	-36.0
MW-51-135	Waterloo Low Flow	Waterloo Multilevel System	Quarterly	130.2	143.7	-62.5	-76.0	135.2	-67.5
MW-51-163	Waterloo Low Flow	Waterloo Multilevel System	Quarterly	154.7	166.2	-87.0	-93.0	162.7	-95.0
MW-51-189	Waterloo Low Flow	Waterloo Multilevel System	Quarterly	184.2	197.8	-116.5	-129.9	189.2	-121.5
MW-52-11	Modified Well Vol. Purge	Peristaltic Pump	Annually	2.0	12.0	14.8	4.8	10.0	6.8
MW-52-18	Waterloo Low Flow	Waterloo Multilevel System	Annually	10.0	30.0	4.9	-15.1	17.5	-2.6
MW-52-48	Waterloo Low Flow	Waterloo Multilevel System	Annually	48.0	56.0	-33.1	-41.1	48.0	-33.1
MW-52-64	Waterloo Low Flow	Waterloo Multilevel System	Annually	59.0	71.5	-44.1	-56.6	64.0	-49.1
MW-52-122	Waterloo Low Flow	Waterloo Multilevel System	Annually	110.5	123.5	-95.6	-108.6	122.0	-107.1
MW-52-162	Waterloo Low Flow	Waterloo Multilevel System	Annually	154.5	164.0	-139.6	-149.1	161.5	-146.6
MW-52-181	Waterloo Low Flow	Waterloo Multilevel System	Annually	171.0	198.1	-136.1	-183.0	181.0	-166.1
MW-53-82	Low Flow	Bladder Pump	Quarterly	62.0	82.0	8.3	-11.7	75.0	-4.7
MW-53-120	Modified Well Vol. Purge	Watertra Pump	Quarterly	100.0	120.0	-29.7	-49.7	105.0	-34.7
MW-54-37	Waterloo Low Flow	Waterloo Multilevel System	Quarterly	29.0	42.0	-15.9	-28.9	36.5	-23.4
MW-54-58	Waterloo Low Flow	Waterloo Multilevel System	Quarterly	51.5	64.0	-38.4	-50.9	57.5	-44.4
MW-54-123	Waterloo Low Flow	Waterloo Multilevel System	Quarterly	116.0	126.0	-102.9	-112.9	123.0	-109.9
MW-54-141	Waterloo Low Flow	Waterloo Multilevel System	Quarterly	135.0	155.5	-121.9	-142.1	141.0	-130.9
MW-54-173	Waterloo Low Flow	Waterloo Multilevel System	Quarterly	170.5	182.0	-157.4	-168.9	172.5	-159.4
MW-54-190	Waterloo Low Flow	Waterloo Multilevel System	Quarterly	185.0	203.6	-171.9	-190.3	190.0	-176.9
MW-55-24	Low Flow	Peristaltic Pump	Quarterly	14.0	24.0	4.3	-5.8	16.0	2.3
MW-55-35	Low Flow	Peristaltic Pump	Quarterly	30.0	35.0	-11.8	-16.8	32.0	-13.8
MW-55-54	Low Flow	Peristaltic Pump	Quarterly	44.0	54.0	-25.8	-35.8	47.0	-28.8
MW-56-53	Low Flow	Bladder Pump	Quarterly	49.2	54.2	21.0	16.0	52.0	18.3
MW-56-83	Modified Well Vol. Purge	Watertra Pump	Semi-Annually	69.9	84.9	0.4	-14.6	74.0	-3.7
MW-57-11	Modified Well Vol. Purge	Peristaltic Pump	Semi-Annually	6.0	11.0	9.0	4.0	10.0	5.0
MW-57-20	Modified Well Vol. Purge	Peristaltic Pump	Annually	15.5	20.5	-0.5	-5.5	19.0	-4.0
MW-57-45	Modified Well Vol. Purge	Peristaltic Pump	Annually	30.5	45.5	-15.5	-30.5	40.0	-25.0
MW-58-26	Low Flow	Peristaltic Pump	Semi-Annually	16.0	26.0	-1.4	-11.4	20.0	-5.4
MW-58-65	Low Flow	Peristaltic Pump	Semi-Annually	50.0	65.0	-35.4	-50.4	54.0	-39.4
MW-59-32	Low Flow	Peristaltic Pump	Inactive	21.0	31.0	-6.5	-16.5	27.0	-12.5
MW-59-45	Low Flow	Peristaltic Pump	Inactive	35.0	45.0	-20.5	-30.5	42.0	-27.5
MW-59-68	Low Flow	Peristaltic Pump	Inactive	53.0	68.0	-38.5	-53.5	58.0	-43.5
MW-60-35	Waterloo Low Flow	Waterloo Multilevel System	Quarterly	24.9	39.4	-12.4	-26.9	34.9	-22.4
MW-60-53	Waterloo Low Flow	Waterloo Multilevel System	Quarterly	45.4	59.4	-32.9	-46.9	53.4	-40.9
MW-60-72	Waterloo Low Flow	Waterloo Multilevel System	Quarterly	66.1	78.9	-53.9	-66.1	72.1	-59.9
MW-60-133	Waterloo Low Flow	Waterloo Multilevel System	Quarterly	124.9	141.4	-112.4	-128.9	134.9	-122.4
MW-60-154	Waterloo Low Flow	Waterloo Multilevel System	Quarterly	147.4	164.9	-134.9	-152.4	154.4	-141.9
MW-60-176	Waterloo Low Flow	Waterloo Multilevel System	Quarterly	170.9	200.4	-158.4	-187.8	175.9	-163.4

TABLE 1
GROUNDWATER SAMPLING METHODS, EQUIPMENT, FREQUENCY AND DEPTHS
INDIAN POINT ENERGY CENTER
BUCHANAN, NY

Well ID ¹	Sampling Method	Sampling Equipment Used	Projected 2010 Sampling Frequency ²	SAMPLING INTERVAL ³				SAMPLING DEPTH ⁴	
				Top of Casing		Elevation in Feet msl		Feet Below TOC	Elevation in Feet msl
				Top	Bottom	Top	Bottom		
MW-62-18	Low Flow	Peristaltic Pump	Quarterly	4.7	14.7	10.0	0.0	13.5	1.2
MW-62-37	Low Flow	Peristaltic Pump	Quarterly	33.3	38.3	-18.6	-23.6	34.5	-19.8
MW-62-53	Waterloo Low Flow	Waterloo Multilevel System	Quarterly	49.6	54.1	-36.8	-41.3	53.1	-40.3
MW-62-71	Waterloo Low Flow	Waterloo Multilevel System	Quarterly	61.1	82.6	-48.3	-69.8	71.1	-58.3
MW-62-92	Waterloo Low Flow	Waterloo Multilevel System	Quarterly	88.6	99.1	-75.8	-86.3	91.6	-78.8
MW-62-138	Waterloo Low Flow	Waterloo Multilevel System	Quarterly	126.1	143.6	-113.3	-130.8	138.1	-125.3
MW-62-182	Waterloo Low Flow	Waterloo Multilevel System	Quarterly	177.6	198.7	-164.8	-185.7	182.1	-169.3
MW-63-18	Low Flow	Peristaltic Pump	Quarterly	8.0	18.0	-3.8	-13.8	14.9	0.7
MW-63-34	Low Flow	Peristaltic Pump	Quarterly	30.0	35.0	-15.8	-20.8	31.5	-17.3
MW-63-50	Waterloo Low Flow	Waterloo Multilevel System	Quarterly	41.5	58.0	-29.2	-45.7	49.5	-37.2
MW-63-93	Waterloo Low Flow	Waterloo Multilevel System	Quarterly	81.5	100.5	-69.2	-88.2	93.0	-80.7
MW-63-112	Waterloo Low Flow	Waterloo Multilevel System	Quarterly	106.5	112.0	-94.2	-99.7	111.5	-99.2
MW-63-163	Waterloo Low Flow	Waterloo Multilevel System	Quarterly	150.5	165.0	-127.5	-132.7	162.5	-150.2
MW-63-174	Waterloo Low Flow	Waterloo Multilevel System	Quarterly	168.0	191.1	-155.7	-178.6	174.0	-161.7
MW-66-21	Low Flow	Peristaltic Pump	Quarterly	7.0	27.0	6.0	-7.0	14.1	0
MW-66-36	Low Flow	Peristaltic Pump	Quarterly	31.0	36.0	-17.0	-22.0	33.6	-19.5
MW-67-39	Waterloo Low Flow	Waterloo Multilevel System	Quarterly	28.8	54.3	-15.8	-41.3	38.3	-25.8
MW-67-105	Waterloo Low Flow	Waterloo Multilevel System	Quarterly	90.3	110.8	-77.3	-97.8	104.8	-92.3
MW-67-173	Waterloo Low Flow	Waterloo Multilevel System	Quarterly	164.8	188.3	-151.8	-175.3	172.3	-159.8
MW-67-219	Waterloo Low Flow	Waterloo Multilevel System	Quarterly	209.3	229.8	-196.3	-216.8	218.8	-206.3
MW-67-275	Waterloo Low Flow	Waterloo Multilevel System	Quarterly	250.8	281.3	-237.8	-268.3	275.3	-262.8
MW-67-323	Waterloo Low Flow	Waterloo Multilevel System	Quarterly	317.8	328.3	-304.8	-315.3	322.3	-309.8
MW-67-340	Waterloo Low Flow	Waterloo Multilevel System	Quarterly	335.3	347.9	-322.3	-334.9	339.8	-327.3
MW-107	Low Flow	Bladder Pump	Annually	105.1	126.1	34.9	13.9	32.7	110.1
MW-111	Low Flow	Peristaltic Pump	Semi-Annually	11.6	17.4	7.0	1.5	16.5	2.4
U3-ID	Modified Well Vol. Purge	Peristaltic Pump	Quarterly	25.0	27.6	-10.2	-12.8	25.6	-10.8
U3-F1	Low Flow	Peristaltic Pump	Quarterly	0.2	1.2	3.1	2.1	5.7	2.8
U3-F2	Low Flow	Peristaltic Pump	Quarterly	0.6	1.6	2.7	1.7	5.7	2.6
U1-CSS	Low Flow	Peristaltic Pump	Semi-Annually	NA	10.2	NA	NA	4.9	6.1
LAF-002	Low Flow	Bladder Pump	Semi-Annually	NA	NA	NA	NA	NA	NA
U1-NCDS	Grab	NA	Quarterly	NA	NA	NA	NA	NA	NA
U1-SFDS	Grab	NA	Quarterly	NA	NA	NA	NA	NA	NA
MH-5 ⁶	Grab	NA	Quarterly	NA	NA	NA	NA	NA	NA
B-1 ⁶	Grab	NA	Quarterly	NA	NA	NA	NA	NA	NA
B-6 ⁶	Grab	NA	Quarterly	NA	NA	NA	NA	NA	NA

Notes:

- For nested multi-level monitoring wells, suffix of well ID indicates depth (rounded to nearest foot) from reference point on casing to bottom of well screen. For Waterloo multi-level systems, suffix indicates depth (rounded to nearest foot) from reference point on casing to top of sampling port. Well IDs without a suffix are open bedrock wellbores.
- Projected sampling frequencies presented for 2010 are subject to change.
- For nested multi-level monitoring wells, interval includes well screen and sand pack. For Waterloo multi-level systems, interval includes open wellbore between bottom of 1st packer above and top of 1st packer below sampling port. For open bedrock wellbores, interval extends from bottom of casing to bottom of hole.
- Sampling depths within sampling intervals (i.e. location of pump intake) have been located adjacent to a transmissive zone where possible.
- Dot pattern denotes sampling interval is positioned within overburden. Open box indicates sampling interval is in bedrock.
- These locations are storm drains.

TABLE 2
 HISTORIC QUARTERLY LOW TIDE GROUNDWATER ELEVATIONS
 INDIAN POINT ENERGY CENTER
 DUCLIANAN, NY

Well ID	LOW RIVER TIDE GROUNDWATER ELEVATIONS (feet msl)													
	Quarter 1 st , 2007	Quarter 2 nd , 2007	Quarter 3 rd , 2007	Quarter 4 th , 2007	Quarter 1 st , 2008	Quarter 2 nd , 2008	Quarter 3 rd , 2008	Quarter 4 th , 2008	Quarter 1 st , 2009	Quarter 2 nd , 2009	Quarter 3 rd , 2009	Quarter 4 th , 2009	Quarter 1 st , 2010	Quarter 2 nd , 2010
MW-50-42	7.24	NA	NA	NA	NA	5.24	6.40	7.06	5.66	6.09	-	-	-	-
MW-50-66	3.71	NA	NA	NA	1.97	2.24	2.83	2.34	1.95	2.82	-	-	-	-
MW-51-40	NA	48.69	50.07	51.95	48.69	52.35	49.44	49.24	49.32	45.15	46.45	42.45	43.37	41.72
MW-51-79	NA	39.92	41.07	42.91	40.71	44.17	40.71	42.91	42.75	42.15	-	-	-	-
MW-51-102	NA	35.98	38.07	38.46	39.04	39.04	36.56	36.17	38.18	37.58	-	-	-	-
MW-51-104	NA	37.93	38.41	38.41	39.02	39.02	36.49	36.03	37.99	37.49	-	-	-	-
MW-51-135	NA	37.42	39.47	39.99	40.71	40.71	38.10	37.68	39.75	39.34	-	-	-	-
MW-51-163	NA	33.79	34.83	36.15	36.77	34.30	33.50	35.74	35.44	35.44	-	-	-	-
MW-51-189	NA	29.33	30.16	31.34	31.79	31.79	29.65	30.81	30.81	30.48	32.18	29.93	31.85	31.42
MW-52-11	6.04	5.61	8.12	8.47	8.85	8.12	8.65	8.41	8.19	9.20	-	-	-	-
MW-52-18	7.68	NA	6.64	6.35	6.04	6.07	5.89	6.02	5.78	5.87	-	-	-	-
MW-52-48	5.96	5.90	5.90	5.25	5.03	5.21	5.21	5.16	5.20	4.89	-	-	-	-
MW-52-64	5.34	NA	4.11	4.44	4.32	4.32	4.36	4.68	4.73	4.23	-	-	-	-
MW-52-122	5.25	NA	4.26	4.22	4.18	4.18	4.21	4.55	4.11	4.20	-	-	-	-
MW-52-162	9.67	NA	-0.80	-1.31	-0.80	-0.80	-0.98	-1.30	-2.07	-1.58	-	-	-	-
MW-52-181	9.41	NA	-1.08	-1.56	-1.06	-1.06	-1.30	-1.61	-2.38	-1.54	-	-	-	-
MW-53-82	NA	9.59	10.03	11.99	12.66	10.35	10.35	11.11	11.11	9.87	11.11	9.87	11.15	11.67
MW-53-120	9.91	9.18	9.59	10.87	11.49	9.76	11.49	10.55	9.76	9.78	10.43	9.43	10.53	11.02
MW-54-35	NA	NA	NA	6.40	6.36	6.27	6.36	6.41	5.75	5.87	-	-	-	-
MW-54-37	7.52	NA	6.38	6.45	6.53	6.30	6.53	6.58	5.90	6.04	-	-	-	-
MW-54-58	6.86	NA	5.82	5.60	5.55	5.53	5.76	5.76	5.49	5.17	-	-	-	-
MW-54-123	5.69	NA	4.16	3.65	3.52	4.01	4.06	4.06	2.99	3.56	-	-	-	-
MW-54-144	8.85	NA	7.13	6.60	6.92	6.48	6.92	6.97	5.89	6.53	-	-	-	-
MW-54-173	5.17	NA	3.52	2.99	2.85	3.29	3.29	2.72	2.72	2.72	-	-	-	-
MW-54-190	5.08	NA	3.16	2.91	2.76	3.16	3.16	2.76	2.00	2.49	-	-	-	-
MW-55-24	8.56	7.82	8.17	8.17	8.16	8.16	8.18	9.02	8.35	8.06	8.39	7.80	8.58	8.56
MW-55-35	8.10	7.29	7.32	8.08	7.59	7.60	8.30	7.63	7.60	9.49	-	-	-	-
MW-55-54	8.47	7.65	7.75	8.08	8.22	8.22	8.22	8.82	8.22	7.89	8.14	7.66	8.39	8.34
MW-56-53	21.04	20.16	NA	NA	29.93	NA	NA	21.90	27.33	22.06	-	-	-	-
MW-56-83	21.10	20.10	22.18	26.41	29.16	NA	25.11	25.11	25.13	22.60	-	-	-	-
MW-57-11	9.57	8.83	9.36	10.99	10.03	10.03	10.03	10.27	11.11	10.09	-	-	-	-
MW-57-20	9.38	NA	NA	NA	12.07	NA	9.92	10.65	10.65	9.84	-	-	-	-
MW-57-45	9.08	NA	NA	NA	10.89	NA	NA	10.71	10.71	NA	-	-	-	-
MW-58-36	8.03	6.49	6.58	8.32	7.29	7.29	7.19	7.56	7.56	7.40	-	-	-	-
MW-58-65	6.03	6.83	6.22	6.22	7.36	7.36	6.46	6.68	6.68	6.70	-	-	-	-
MW-59-32	1.06	NA	0.67	0.42	0.81	0.77	0.81	0.47	0.31	1.37	-	-	-	-
MW-59-45	1.06	1.27	0.42	NA	9.23	NA	NA	2.52	0.44	NA	-	-	-	-
MW-59-68	2.91	2.51	1.97	0.90	-0.11	NA	NA	-1.79	-5.66	7.93	-	-	-	-
MW-60-35	2.19	1.28	1.32	1.58	1.63	1.63	2.04	1.99	3.07	3.07	-	-	-	-
MW-60-53	4.63	-1.24	-1.67	-2.04	-1.37	-1.37	-1.76	-2.03	-2.70	NA	-	-	-	-
MW-60-72	NA	-0.28	-0.73	-1.10	-0.47	-0.47	-0.90	-1.21	-1.91	NA	-	-	-	-
MW-60-135	9.94	0.11	-0.44	-0.68	-0.14	-0.14	-0.64	-1.43	-1.43	0.28	-	-	-	-
MW-60-154	0.08	-0.36	-1.61	-2.07	-1.49	-0.27	-0.71	-1.02	-2.99	0.11	-	-	-	-
MW-60-176	-0.48	-1.38	-2.03	-2.47	-1.82	-1.82	-2.16	-2.50	-3.41	NA	-	-	-	-
MW-62-18	0.25	0.25	-0.37	-0.79	0.13	0.06	0.06	-0.12	-0.82	NA	-	-	-	-
MW-62-37	0.59	0.61	-0.03	-0.46	0.49	0.49	0.59	-0.15	-1.13	0.11	-	-	-	-
MW-62-52	NA	0.48	-0.30	-1.13	-0.19	-0.19	-0.28	-0.93	-1.64	-0.42	-	-	-	-
MW-62-53	0.95	0.54	-0.25	-1.01	-0.16	-0.16	-0.84	-2.03	-2.03	-0.44	-	-	-	-
MW-62-71	1.07	0.88	-0.56	-1.26	-0.55	-0.55	-1.24	-0.85	-1.68	-1.03	-	-	-	-
MW-62-92	1.40	0.77	0.09	-0.76	0.13	0.26	-0.37	-1.33	-1.33	-0.70	-	-	-	-
MW-62-138	1.33	0.38	-0.33	-0.49	0.13	0.13	-0.36	-0.92	-1.33	-0.40	-	-	-	-
MW-62-181	NA	-0.33	-1.83	-0.78	-1.29	-1.29	-1.25	-2.66	-2.66	-1.82	-	-	-	-
MW-63-18	0.14	0.09	-0.10	-0.37	0.09	0.09	0.32	-0.08	-0.64	0.02	-	-	-	-
MW-63-34	0.51	0.19	-0.09	-0.40	0.13	0.13	0.05	-0.13	-0.74	0.18	-	-	-	-

\\17.005.13.0001\78691786917869-02-2010\Water\FINAL Tables\ gw elevations

TABLE 2
HISTORIC QUARTERLY LOW TIDE GROUNDWATER ELEVATIONS
INDIAN POINT ENERGY CENTER
DUCLIANAN, NY

Well ID	LOW RIVER TIDE GROUNDWATER ELEVATIONS (feet msl)														
	Quarter 2 nd , 2007	Quarter 3 rd , 2007	Quarter 4 th , 2007	Quarter 1 st , 2008	Quarter 2 nd , 2008	Quarter 3 rd , 2008	Quarter 4 th , 2008	Quarter 1 st , 2009	Quarter 2 nd , 2009	Quarter 3 rd , 2009	Quarter 4 th , 2009	Quarter 1 st , 2010	Quarter 2 nd , 2010		
MW-63-30	0.86	0.29	-0.38	-1.03	-0.47	-0.55	-1.24	-2.08	-0.45	-	-	-	-		
MW-63-91	1.16	0.48	-0.19	-0.87	-0.25	-0.16	-0.89	NA	-0.61	-	-	-	-		
MW-63-93	NA	0.35	-0.20	-0.87	-0.30	-0.24	-0.98	-1.68	-0.13	-	-	-	-		
MW-63-112	0.63	-0.82	-1.46	-2.05	-0.82	-1.69	-2.26	-3.14	-1.45	-	-	-	-		
MW-63-121	1.41	0.60	-0.18	-0.78	-0.24	-0.05	-0.86	-1.49	0.11	-	-	-	-		
MW-63-163	0.70	-0.39	-0.83	-1.48	-0.86	-0.96	-1.54	-2.46	-0.98	-	-	-	-		
MW-63-174	0.88	0.05	-0.65	-1.29	-0.62	-0.61	-1.19	-1.97	-0.59	-	-	-	-		
MW-65-18	NA	NA	NA	NA	38.60	43.22	NA	48.19	36.98	40.08	38.06	39.94	42.26		
MW-65-80	NA	NA	NA	NA	34.97	32.95	32.72	33.71	33.30	33.79	32.81	33.69	33.98		
MW-66-21	0.26	0.17	-0.22	-0.74	0.05	0.17	0.29	-0.33	0.50	0.52	0.10	-0.01	1.82		
MW-66-36	0.81	0.48	-0.04	-0.51	0.35	0.15	0.10	-0.86	0.51	-	-0.25	-0.43	1.75		
MW-67-39	NA	1.02	0.34	-0.33	0.36	0.41	-0.02	-0.07	-0.56	0.81	-1.25	-0.76	-0.13		
MW-67-105	NA	0.61	0.61	-0.04	0.57	0.65	0.16	-0.67	-0.43	-	-	-	-		
MW-67-173	NA	0.75	-0.14	-0.83	-0.28	-0.26	-0.82	-1.62	-1.55	-	-	-	-		
MW-67-219	NA	0.74	-0.19	-0.91	-0.32	-0.32	-0.86	-1.87	-1.59	-	-	-	-		
MW-67-276	NA	1.61	0.60	-0.13	0.44	0.41	-0.14	-1.03	-0.91	-	-	-	-		
MW-67-323	NA	0.18	-0.96	-1.13	-0.44	-1.35	-1.93	-2.86	-2.73	-	-	-	-		
MW-67-340	NA	0.63	-0.52	-1.31	-0.87	-0.96	-1.56	-2.42	-2.40	-0.76	-3.27	-2.63	-2.26		
MW-107	116.85	113.87	117.48	121.79	118.94	115.00	115.76	120.28	117.52	-	-	-	-		
MW-108	9.58	8.61	8.77	9.98	10.07	9.65	9.02	9.65	9.26	-	-	-	-		
MW-109	9.52	6.80	7.22	9.50	10.12	7.82	7.88	NA	4.95	-	-	-	-		
MW-111	9.56	9.66	9.74	10.74	11.24	9.74	10.48	10.87	9.47	-	-	-	-		
QUT-1	NA	1.31	1.16	0.76	0.81	NA	NA	NA	1.08	-	-0.77	1.02	-		
RW-1	NA	NA	30.15	NA	30.04	29.52	29.05	29.10	NA	-	-	-	5.06		
UT-CSS	NA	NA	19.11	NA	15.39	NA	NA	20.46	13.89	-	-	-	-		
U3-1	4.20	NA	NA	NA	NA	NA	NA	NA	NA	-	-	-	-		
U3-2	5.34	NA	NA	NA	NA	NA	NA	NA	NA	-	-	-	-		
U3-3	7.53	6.52	6.63	8.67	9.25	8.25	8.94	9.13	7.29	-	-	-	-		
U3-4D	4.25	NA	3.35	3.22	2.74	3.49	2.69	3.41	3.75	-	-	-	-		
U3-4S	3.91	4.13	3.80	3.74	3.97	4.31	3.81	4.01	4.23	-	-	-	-		
U3-C1	NA	1.64	3.58	3.36	0.99	2.36	0.81	0.64	1.92	2.43	0.12	0.20	2.98		
U3-T1	4.51	4.12	3.67	3.99	3.86	4.33	3.69	3.83	4.12	-	-	-	-		
U3-T2	4.33	4.02	3.79	4.20	3.94	4.28	3.76	4.05	4.20	-	-	-	-		

Notes:

- 1. Quarter 2 groundwater elevations were measured on 6/1/07 at 6:20 am.
- 2. Quarter 3 groundwater elevations were measured on 9/25/07 at 4:32 am.
- 3. Quarter 4, 2007 groundwater elevations were measured on 12/9/07 at 4:15 am.
- 4. Quarter 1, 2008 groundwater elevations were measured on 1/3/08 at 1:14 a.m.
- 5. Quarter 2, 2008 groundwater elevations were measured on 4/4/08 at 5:14 pm.
- 6. Quarter 3, 2008 groundwater elevations were measured on 7/10/08 at 11:35 am.
- 7. Quarter 4, 2008 groundwater elevations were measured on 11/11/08 at 2:54 am.
- 8. Quarter 1, 2009 groundwater elevations were measured on 1/9/09 at 2:42 am.
- 9. Quarter 2, 2009 groundwater elevations were measured on 5/22/09 at 2:41 pm.
- 10. Quarter 3, 2009 groundwater elevations were measured on 8/9/09 at 8:18 am.
- 11. Subsequent to Quarter 2, 2009, as described in our June 14, 2010 memorandum which was included as Appendix J in the Quarter 1, 2009 Report, a reduced number of transducers will be maintained in long term operation. The rationale for this reduced transducer redeployment is included in the June 14, 2010 memorandum.
- 12. MW-32 groundwater elevations from 2nd quarter, 2007 were based on initial Waterloo Multi-Level configuration, which was subsequently reconfigured, initial depth intervals approximately corresponding to current configuration are listed in parentheses. The current configuration intervals MW-32-48 and MW-32-173 have no representative equivalent within the old configuration.
- 13. Quarter 4, 2009 groundwater elevations were measured on 11/28/09 at 3:45 pm.
- 14. Quarter 1, 2010 groundwater elevations were measured on 1/30/10 at 6:30 am.
- 15. Quarter 2, 2010 groundwater elevations were measured on 4/09/10 at 12:05 pm.

TABLE 5
HISTORIC GROUNDWATER ANALYTICAL RESULTS
INDIAN POINT ENERGY CENTER
BUCHANAN, TN

Well ID	SAMPLE ZONE CENTER, elevation ft w.r.t. top of casing	SAMPLE ZONE CENTER, depth ft below top of casing	SAMPLE COLLECTION			ANALYSIS RESULTS												Well ID		
			Date	Time	TRITIUM (pCi/L)			Sr-90 (pCi/L)			Cs-137 (pCi/L)			Co-60 (pCi/L)			Ra-226 (pCi/L)			
					Result	MDC	Std. Dev.	Result	MDC	Std. Dev.	Result	MDC	Std. Dev.	Result	MDC	Std. Dev.	Result		MDC	Std. Dev.
MW-32-46	006	588	4/26/2010	11:28	6.18E+04	1.80E+02	1.79E+02	3.02E+01	8.41E-01	3.11E+00	7.60E+00	7.62E+00	1.83E+00	6.18E+00	7.26E+00	NA	NA	MW-32-46		
MW-32-59	001	588	1/09/2007	9:30	7.67E+03	7.50E+02	5.20E+02	1.47E+00	1.60E+01	-8.00E-01	1.98E+00	2.00E+00	4.90E-01	2.88E+00	2.60E+00	NA	NA	MW-32-59		
	002	588	6/28/2007	14:25	2.40E+04	7.50E+02	1.97E+02	5.20E+01	7.97E-01	-1.48E+00	3.10E+00	3.00E+00	-1.20E+00	3.87E+00	3.24E+00	NA	NA	MW-32-59		
	003	588	8/13/2007	13:07	1.42E+04	6.00E+02	1.99E+02	4.22E+01	7.88E-01	1.48E+00	2.20E+00	3.22E+00	-1.60E+00	3.00E+00	3.65E+00	NA	NA	MW-32-59		
	004	588	10/30/2007	14:07	1.11E+04	4.00E+02	1.84E+02	3.41E+01	7.06E-01	-1.94E+00	1.84E+00	3.82E+00	1.99E+00	2.45E+00	4.08E+00	NA	NA	MW-32-59		
	005	588	1/18/2008	13:25	1.87E+04	9.11E+02	1.86E+02	4.67E+01	5.98E-01	-1.97E+00	1.89E+00	4.79E+00	1.59E+00	3.81E+00	4.63E+00	NA	NA	MW-32-59		
	006	588	5/5/2008	15:33	4.13E+03	2.01E+02	1.82E+02	5.20E+01	9.70E-01	-7.03E-01	1.89E+00	3.03E+00	1.25E+00	2.01E+00	3.77E+00	NA	NA	MW-32-59		
	007	588	6/9/2008	13:10	2.88E+03	1.81E+02	1.50E+02	3.64E+01	7.91E-01	-2.22E+00	1.92E+00	2.98E+00	-1.08E+00	2.47E+00	3.91E+00	NA	NA	MW-32-59		
	008	588	7/31/2008	13:23	1.58E+03	1.63E+02	1.94E+02	3.81E+01	6.90E-01	-4.60E-01	1.97E+00	3.33E+00	-1.08E+00	2.48E+00	3.26E+00	NA	NA	MW-32-59		
	009	588	9/2/2008	13:52	2.44E+03	4.59E+02	2.19E+02	9.94E-01	7.7E-01	1.85E+00	3.21E+00	NA	NA	NA	NA	NA	MW-32-59			
	010	588	10/14/2008	13:59	4.13E+02	2.00E+02	1.73E+02	6.05E-01	7.41E-01	-3.50E-01	7.71E+00	2.00E+00	-1.20E+00	6.29E+00	6.65E+00	NA	NA	MW-32-59		
	011	588	2/12/2009	15:46	1.78E+04	1.03E+03	1.98E+02	1.01E+01	7.99E-01	1.01E+01	3.71E+00	3.41E+00	2.72E+00	3.41E+00	4.11E+00	NA	NA	MW-32-59		
	012	588	4/21/2009	15:51	5.43E+04	3.00E+03	4.23E+02	5.13E+01	6.91E-01	-3.21E+00	4.83E+00	2.22E+00	-5.57E+02	3.60E+00	4.12E+00	NA	NA	MW-32-59		
	013	588	6/16/2009	14:59	8.69E+03	5.00E+02	3.77E+02	1.25E+01	5.25E-01	-1.72E-01	2.62E+00	6.41E+00	-2.60E+01	5.03E+00	6.02E+00	NA	NA	MW-32-59		
	014	588	8/11/2009	14:46	4.64E+03	2.40E+02	1.76E+02	4.47E+01	4.47E-01	4.57E+00	4.61E+00	5.69E+00	3.18E+00	5.27E+00	5.60E+00	NA	NA	MW-32-59		
	015	588	8/21/2009	14:34	3.85E+04	2.09E+03	1.15E+03	3.20E+01	4.35E-01	-4.57E+00	4.17E+00	5.40E+00	3.18E+00	5.27E+00	5.60E+00	NA	NA	MW-32-59		
	016	588	10/22/2009	14:37	5.01E+03	3.69E+02	1.55E+02	6.81E+01	9.02E-01	1.15E+00	5.92E+00	6.03E+00	-3.15E+01	1.10E+00	5.67E+00	NA	NA	MW-32-59		
	017	588	11/26/2009	14:37	3.33E+03	1.66E+02	1.43E+02	6.48E+01	9.02E-01	1.15E+00	5.92E+00	6.03E+00	-3.15E+01	1.10E+00	5.67E+00	NA	NA	MW-32-59		
	018	588	1/29/2010	14:01	8.92E+04	3.43E+03	6.29E+02	3.18E+01	4.34E-01	1.02E+00	4.67E+00	4.72E+00	3.06E+00	3.93E+00	4.92E+00	NA	NA	MW-32-59		
	019	588	3/4/2010	13:23	6.81E+04	1.03E+03	1.67E+02	1.51E+01	7.90E-01	6.62E+00	5.62E+00	4.62E+00	-1.00E+00	5.22E+00	4.21E+00	NA	NA	MW-32-59		
	020	588	6/8/2010	11:30	6.83E+04	2.00E+03	1.83E+02	3.10E+01	6.20E-01	4.93E+00	4.62E+00	6.21E+00	1.53E+00	4.66E+00	5.81E+00	NA	NA	MW-32-59		
	021	588	1/15/2011	14:53	1.53E+04	4.58E+02	4.89E+02	4.10E+01	7.71E-01	-9.71E-01	6.12E+00	6.70E+00	1.48E+00	6.65E+00	7.92E+00	NA	NA	MW-32-59		
	022	853	8/5/2007	9:40	1.12E+04	8.40E+02	5.39E+02	3.20E+01	1.47E+00	1.60E+00	4.37E+00	3.10E+00	9.00E+01	4.20E+00	4.80E+00	NA	NA	MW-32-59		
	023	853	8/28/2007	15:05	5.42E+04	3.77E+02	1.95E+02	5.10E+01	-1.70E-01	-1.70E-01	2.82E+00	3.02E+00	-4.05E+01	3.19E+00	3.21E+00	NA	NA	MW-32-59		
	024	853	8/14/2007	10:48	3.70E+04	4.05E+02	2.01E+02	4.74E+01	6.75E-01	2.82E+00	2.81E+00	3.13E+00	9.90E+01	2.98E+00	3.61E+00	NA	NA	MW-32-59		
	025	853	10/26/2007	11:12	1.20E+04	4.79E+02	1.79E+02	4.27E+01	8.85E-01	3.57E+00	2.67E+00	3.45E+00	-1.85E+02	3.23E+00	3.63E+00	NA	NA	MW-32-59		
	026	853	1/18/2008	14:50	1.07E+04	6.90E+02	1.83E+02	4.18E+01	4.18E-01	3.57E+00	2.67E+00	3.45E+00	-1.85E+02	3.23E+00	3.63E+00	NA	NA	MW-32-59		
	027	853	5/7/2008	14:10	8.36E+03	2.65E+02	1.81E+02	4.65E+01	7.93E-01	1.95E+00	2.01E+00	3.60E+00	-3.64E+01	1.97E+00	2.13E+00	NA	NA	MW-32-59		
	028	853	6/9/2008	14:23	1.11E+04	5.04E+02	2.50E+02	3.57E+01	7.12E-01	1.39E+00	2.01E+00	3.60E+00	-3.64E+01	1.97E+00	2.13E+00	NA	NA	MW-32-59		
	029	853	7/31/2008	14:35	7.48E+03	2.83E+02	1.93E+02	3.35E+01	6.24E-01	2.14E+00	2.05E+00	3.50E+00	1.07E+00	2.88E+00	3.44E+00	NA	NA	MW-32-59		
	030	853	9/2/2008	14:40	8.05E+03	6.90E+02	3.52E+02	4.13E+01	7.93E-01	-1.37E+00	2.45E+00	3.52E+00	3.52E+00	NA	NA	NA	MW-32-59			
	031	853	10/17/2008	14:50	8.69E+03	6.60E+02	1.72E+02	4.13E+01	5.90E-01	1.39E+00	3.52E+00	6.02E+00	3.08E+00	5.21E+00	NA	NA	MW-32-59			
	032	853	4/6/2009	14:46	4.64E+03	2.40E+02	1.76E+02	4.47E+01	4.47E-01	4.57E+00	4.61E+00	5.69E+00	3.18E+00	5.27E+00	5.60E+00	NA	NA	MW-32-59		
	033	853	6/7/2009	14:34	8.07E+03	1.04E+03	3.76E+02	4.15E+01	6.47E-01	-1.73E+00	1.30E+00	5.65E+00	9.98E+01	8.75E+00	9.01E+00	NA	NA	MW-32-59		
	034	853	8/21/2009	14:11	8.98E+03	4.23E+02	2.11E+02	4.82E+01	9.14E-01	8.14E+00	5.03E+00	5.69E+00	-4.97E+00	5.84E+00	5.84E+00	NA	NA	MW-32-59		
	035	853	9/14/2009	15:06	7.70E+03	1.17E+02	1.57E+02	1.08E+01	7.16E-01	2.26E+00	4.93E+00	5.62E+00	-4.63E+00	5.54E+00	5.03E+00	NA	NA	MW-32-59		
	036	853	10/22/2009	13:53	7.60E+03	2.83E+02	1.66E+02	1.01E+01	5.41E-01	1.58E+00	1.11E+01	5.61E+00	-2.02E+00	6.51E+00	6.87E+00	NA	NA	MW-32-59		
	037	853	1/29/2010	14:38	8.03E+03	1.11E+03	4.20E+02	6.80E+01	8.20E-01	2.21E+00	6.63E+00	4.90E+00	2.29E+00	3.27E+00	4.03E+00	NA	NA	MW-32-59		
	038	853	3/4/2010	14:44	9.31E+03	3.62E+02	1.68E+02	2.46E+01	4.71E-01	3.02E+00	3.43E+00	3.83E+00	-1.20E+00	3.88E+00	4.04E+00	NA	NA	MW-32-59		
	039	853	4/28/2010	13:08	1.13E+04	4.85E+02	2.14E+02	3.95E+01	7.02E-01	-7.18E+00	9.07E+00	9.43E+00	1.03E+00	6.79E+00	8.03E+00	NA	NA	MW-32-59		
	040	853	6/9/2010	12:03	1.20E+04	4.85E+02	2.14E+02	3.95E+01	7.02E-01	-7.18E+00	9.07E+00	9.43E+00	1.03E+00	6.79E+00	8.03E+00	NA	NA	MW-32-59		
	041	14E-3	1/19/2007	9:45	1.13E+04	8.40E+02	5.30E+02	1.47E+00	1.90E+00	-6.00E+02	2.04E+00	2.00E+00	-7.73E+01	5.68E+00	6.20E+00	NA	NA	MW-32-131		
	042	14E-3	6/28/2007	12:45	3.02E+02	1.88E+02	1.97E+02	5.13E+01	5.94E-01	-1.66E+00	5.09E+00	4.90E+00	3.40E+00	2.07E+00	2.40E+00	NA	NA	MW-32-131		
	043	14E-3	8/12/2007	11:15	1.29E+02	1.70E+02	1.87E+02	2.69E+01	8.31E-01	-8.09E+01	4.86E+00	4.85E+00	-1.19E+00	3.76E+00	4.38E+00	NA	NA	MW-32-131		
	044	14E-3	10/26/2007	11:45	3.78E+02	2.99E+02	2.47E+02	6.03E+01	7.90E-01	-3.81E+01	3.48E+00	3.82E+00	-2.37E+00	3.29E+00	3.21E+00	NA	NA	MW-32-131		
	045	14E-3	1/12/2008	11:23	5.05E+02	2.07E+02	1.79E+02	7.79E+01	8.02E-01	8.47E+00	2.18E+00	2.21E+00	-8.40E+01	1.98E+00	2.18E+00	NA	NA	MW-32-131		
	046	14E-3	3/5/2008	12:35	1.03E+03	1.46E+02	1.83E+02	3.98E+01	7.51E-01	-1.21E+00	2.88E+00	3.55E+00	-3.26E+01	2.27E+00	3.66E+00	NA	NA	MW-32-131		
	047	14E-3	10/29/2007	10:10	2.92E+03	2.98E+02	1.99E+02	8.92E+01	6.02E-01	1.89E+00	3.10E+00	3.12E+00	-3.58E+01	2.59E+00	3.92E+00	NA	NA	MW-32-131		
	048	14E-3	1/16/2008	10:46	1.67E+03	1.93E+02	1.83E+02	4.72E+01	5.97E-01	-2.90E+00	3.72E+00	3.65E+00	-3.48E+01	2.71E+00	3.58E+00	NA	NA	MW-32-131		
	049	14E-3	2/12/2008	10:43	3.33E+03	1.31E+02	1.38E+02	7.29E+01	7.01E-01	-2.90E+00	3.72E+00	3.65E+00	-3.48E+01	2.71E+00	3.58E+00	NA	NA	MW-32-131		
	050	14E-3	7/21/2008	11:10	3.33E+03	1.31E+02	1.38E+02	7.29E+01	7.01E-01											

TABLE 5
HISTORIC GROUNDWATER ANALYTICAL RESULTS
INDIAN POINT ENERGY CENTER
BUCHANAN, TN

Well ID	SAMPLE ZONE CENTER, elevation ft w.r.t. top of casing	SAMPLE ZONE CENTER, elevation ft w.r.t. top of casing	SAMPLE COLLECTION			ANALYSIS RESULTS												Well ID			
			Date	Time	TRITIUM (pCi/L)				Sr-90 (pCi/L)				Co-60 (pCi/L)				N-63 (pCi/L)				
					Result	Std. Dev.	MDC	Result	Std. Dev.	MDC	Result	Std. Dev.	MDC	Result	Std. Dev.	MDC	Result		Std. Dev.	MDC	
MW-40-46	002	46.2	7/21/2007	12:15	9.48E-01	1.71E-02	3.50E-01	5.61E-01	6.48E-01	-9.08E-01	3.70E-00	4.09E-00	1.72E-00	3.07E-00	2.90E+00	BA	BA	BA	BA	MW-40-46	
	003	46.2	10/12/2007	14:43	-1.59E-01	1.52E-02	-1.48E-02	5.10E-01	6.51E-01	-3.80E-01	3.22E-00	3.59E-00	4.94E-01	4.92E-00	4.26E+00	BA	BA	BA	BA	BA	
	004	46.2	1/7/2008	14:44	1.45E-01	1.43E-02	1.80E-02	8.35E-01	8.75E-01	-2.21E-01	2.84E-00	3.00E-00	1.10E-00	2.48E-00	2.82E+00	BA	BA	BA	BA	BA	
	005	46.2	8/11/2008	13:35	1.68E-02	1.04E-02	3.24E-01	3.77E-01	8.29E-01	1.25E-01	1.59E-00	3.39E-00	7.89E-00	1.09E-00	2.05E+00	3.48E+00	BA	BA	BA	BA	BA
	006	46.2	10/28/2008	14:28	8.80E-01	1.74E-02	1.98E-02	6.33E-01	7.02E-01	-2.82E-01	6.53E-00	7.89E-00	1.83E-00	6.00E+00	7.48E+00	1.71E+01	2.01E+01	2.01E+01	2.01E+01	2.01E+01	2.01E+01
	007	46.2	1/19/2009	14:28	1.70E-01	1.35E-02	1.48E-02	2.69E-01	5.01E-01	8.48E-01	-1.19E-01	2.88E-00	3.99E-00	2.78E+00	2.78E+00	2.88E+00	1.71E+01	2.22E+01	2.22E+01	2.22E+01	2.22E+01
	008	46.2	4/13/2009	14:40	1.52E-02	1.37E-02	1.35E-02	5.21E-01	7.12E-01	-1.00E-01	6.89E-00	4.99E-00	-2.72E-01	4.01E+00	-4.40E+00	-5.37E+00	1.97E+01	2.22E+01	2.22E+01	2.22E+01	2.22E+01
	009	46.2	7/29/2009	15:11	1.48E-01	1.92E-02	1.13E-02	5.81E-01	6.03E-01	-1.03E-01	7.61E-00	7.22E-00	-1.38E-00	4.42E+00	6.60E+00	BA	BA	BA	BA	BA	
	010	46.2	11/19/2009	15:07	5.74E-01	9.82E-01	8.82E-01	5.13E-01	5.92E-01	-9.97E-01	4.23E-00	4.70E-00	1.09E-00	6.45E+00	5.35E+00	BA	BA	BA	BA	BA	
	011	46.2	2/4/2010	14:59	9.28E-01	1.62E-02	1.82E-02	6.20E-01	7.56E-01	7.95E-01	4.30E-00	5.36E-00	1.37E-00	4.96E+00	5.80E+00	BA	BA	BA	BA	BA	
MW-40-81	001	80.7	4/13/2010	14:18	2.32E-01	1.38E-02	1.45E-02	3.98E-01	7.23E-01	2.73E-00	3.00E-00	4.08E-00	1.19E-00	4.96E+00	3.95E+00	BA	BA	BA	BA	BA	
	002	80.7	6/5/2007	12:37	1.63E-02	1.59E-02	-2.92E-02	6.98E-01	9.11E-01	-1.00E-00	3.09E-00	3.22E-00	-4.70E-00	3.79E+00	3.62E+00	BA	BA	BA	BA	BA	
	003	80.7	7/23/2007	13:00	6.99E-01	1.53E-02	2.43E-02	5.00E-01	6.94E-01	-7.08E-01	4.93E-00	5.20E-00	2.31E-00	3.81E+00	4.95E+00	BA	BA	BA	BA	BA	
	004	80.7	10/12/2007	10:52	6.99E-01	1.53E-02	-2.65E-02	5.05E-01	7.09E-01	5.47E-01	4.02E-00	4.82E-00	5.73E-01	4.02E+00	4.64E+00	BA	BA	BA	BA	BA	
	005	80.7	8/11/2008	14:44	1.48E-01	1.66E-02	1.78E-02	6.86E-01	6.83E-01	-2.54E-01	5.40E-00	3.79E-00	2.40E-00	1.93E+00	2.16E+00	1.93E+01	2.16E+01	2.16E+01	2.16E+01	2.16E+01	
	006	80.7	10/28/2008	14:28	3.01E-01	1.61E-02	1.93E-02	1.81E-01	6.58E-01	2.04E-00	5.39E-00	6.31E-00	6.31E-00	6.31E-00	6.31E-00	6.31E-00	6.31E-00	6.31E-00	6.31E-00	6.31E-00	6.31E-00
	007	80.7	1/19/2009	14:38	1.61E-01	1.37E-02	1.48E-02	3.29E-01	6.54E-01	-1.67E-01	5.39E-00	4.01E-00	1.41E-00	3.77E+00	3.92E+00	7.54E+00	1.77E+01	2.01E+01	2.01E+01	2.01E+01	
	008	80.7	4/13/2009	14:36	2.31E-02	1.50E-02	1.34E-02	6.47E-01	8.17E-01	-1.98E-00	1.17E-00	4.78E-00	3.13E-00	4.67E+00	6.04E+00	1.26E+01	2.01E+01	2.01E+01	2.01E+01	2.01E+01	
	009	80.7	7/23/2009	14:28	1.31E-02	1.93E-02	1.41E-02	4.31E-01	5.48E-01	-7.98E-01	4.88E-00	5.50E-00	3.78E-00	5.54E+00	5.94E+00	BA	BA	BA	BA	BA	
	010	80.7	11/17/2009	13:51	9.11E-01	8.83E-01	9.43E-01	6.63E-01	8.17E-01	-4.21E-00	6.69E-00	5.16E-00	2.83E-00	4.76E+00	4.81E+00	BA	BA	BA	BA	BA	
MW-40-100	001	80.7	2/4/2010	10:56	1.47E-02	1.65E-02	1.83E-02	3.99E-02	6.37E-01	1.42E-00	4.02E-00	4.69E-00	-7.18E-01	3.86E+00	5.42E+00	BA	BA	BA	BA	BA	
	002	106.2	6/12/2007	13:15	1.92E-02	1.37E-02	1.47E-02	4.23E-01	7.02E-01	1.72E-00	4.40E-00	4.93E-00	1.08E-01	3.82E+00	4.36E+00	BA	BA	BA	BA	BA	
	003	106.2	7/24/2007	13:20	8.12E-01	1.55E-02	1.64E-02	3.40E-01	6.16E-01	-1.24E-00	3.04E-00	3.04E-00	1.58E+00	3.87E+00	3.91E+00	BA	BA	BA	BA	BA	
	004	106.2	10/12/2007	11:03	5.95E-01	1.53E-02	1.73E-02	2.91E-01	6.18E-01	-1.93E-00	3.57E-00	3.87E-00	8.90E-01	3.30E+00	3.61E+00	BA	BA	BA	BA	BA	
	005	106.2	1/7/2008	11:55	1.98E-01	1.52E-02	1.81E-02	-7.39E-02	5.85E-01	8.00E-01	3.13E-00	2.27E-00	2.60E-00	8.84E-02	2.75E+00	2.86E+00	BA	BA	BA	BA	
	006	106.2	5/9/2008	12:45	1.16E-02	1.05E-02	1.16E-02	1.65E-01	5.60E-01	-7.43E-01	1.18E-00	1.92E-00	2.68E-00	6.38E-01	1.52E+00	2.00E+00	3.15E+00	1.09E+01	1.89E+01	2.06E+01	2.06E+01
	007	106.2	8/11/2008	10:10	1.93E-02	1.73E-02	1.95E-02	1.13E-01	6.27E-01	-1.23E-00	1.13E-00	1.53E-00	3.85E-00	7.02E+00	8.03E+00	-7.70E+00	-9.80E+00	1.79E+01	2.24E+01	2.24E+01	
	008	106.2	11/23/2008	11:52	4.24E-01	1.36E-02	1.48E-02	1.06E-01	5.03E-01	6.12E-01	-2.19E-00	5.97E-00	3.85E-00	1.28E-01	3.13E+00	3.61E+00	5.90E+00	5.90E+00	5.90E+00	5.90E+00	
	009	106.2	1/19/2009	11:37	2.62E-02	1.56E-02	1.58E-02	6.63E-01	6.52E-01	6.52E-01	6.52E-01	6.52E-01	6.52E-01	6.52E-01	6.52E-01	6.52E-01	6.52E-01	6.52E-01	6.52E-01	6.52E-01	6.52E-01
	010	106.2	2/6/2010	14:34	3.23E-01	1.67E-02	1.82E-02	7.06E-01	7.90E-01	-1.00E-00	3.73E-00	3.73E-00	3.73E-00	3.73E-00	3.73E-00	3.73E-00	3.73E-00	3.73E-00	3.73E-00	3.73E-00	3.73E-00
MW-40-127	001	106.2	2/6/2010	13:16	1.47E-02	1.65E-02	1.82E-02	7.06E-01	7.83E-01	-2.58E-01	4.76E-00	4.60E-00	-3.30E-00	4.75E+00	4.53E+00	BA	BA	BA	BA	BA	
	002	127.2	5/4	6/5/2007	12:55	1.87E-02	1.63E-02	1.63E-02	2.60E-01	5.93E-01	5.71E-01	5.71E-01	5.71E-01	5.71E-01	5.71E-01	5.71E-01	5.71E-01	5.71E-01	5.71E-01	5.71E-01	5.71E-01
	003	127.2	5/4	7/23/2007	13:15	4.20E-01	1.41E-02	1.65E-02	3.83E-01	5.72E-01	-1.17E-00	1.67E-00	1.76E-00	2.04E-01	1.59E+00	1.77E+00	BA	BA	BA	BA	BA
	004	127.2	5/4	10/12/2007	11:30	2.81E-01	1.41E-02	1.61E-02	1.01E-01	4.97E-01	6.41E-01	3.50E-00	1.62E-00	4.02E-00	4.11E+00	3.79E+00	BA	BA	BA	BA	BA
	005	127.2	5/4	1/7/2008	12:30	9.73E-00	1.48E-02	1.79E-02	6.83E-01	7.23E-01	6.43E-01	2.42E-00	2.77E-00	3.24E-01	2.28E+00	2.39E+00	BA	BA	BA	BA	BA
	006	127.2	5/4	5/9/2008	12:30	3.27E-01	1.60E-02	1.60E-02	-4.84E-01	5.30E-01	9.88E-01	6.92E-00	3.43E-00	3.43E-00	2.00E+00	3.62E+00	BA	BA	BA	BA	BA
	007	127.2	5/4	8/11/2008	10:34	1.68E-02	1.04E-02	1.70E-02	1.65E-01	2.41E-01	1.92E-01	1.63E-00	2.81E-00	2.81E-00	1.49E+00	2.51E+00	BA	BA	BA	BA	BA
	008	127.2	5/4	10/28/2008	12:10	7.53E-01	1.70E-02	1.95E-02	4.46E-01	7.10E-01	7.57E-01	-2.53E-00	6.88E-00	-4.33E+00	8.23E+00	7.68E+00	0.90E+00	1.66E+00	1.66E+00	1.66E+00	1.66E+00
	009	127.2	5/4	1/19/2009	11:25	9.22E-01	1.33E-02	1.48E-02	-7.90E-02	7.19E-01	9.90E-01	-1.20E-00	3.73E-00	3.94E-00	1.68E-00	3.66E+00	4.44E+00	4.44E+00	4.44E+00	4.44E+00	4.44E+00
	010	127.2	5/4	4/13/2009	11:24	1.52E-02	1.35E-02	1.38E-02	5.56E-02	6.11E-01	7.65E-01	-1.08E-00	1.65E-00	4.77E-00	-1.39E-00	4.58E+00	4.79E+00	-9.13E+00	1.86E+01	2.22E+01	2.22E+01
MW-40-162	001	127.2	5/4	7/23/2009	14:09	1.77E-02	1.98E-02	2.38E-02	3.28E-01	7.11E-01	3.30E-02	6.03E-00	6.40E-00	1.13E-00	5.50E+00	6.28E+00	BA	BA	BA	BA	
	002	127.2	5/4	11/17/2009	14:53	1.04E-02	9.33E-03	9.89E-03	2.64E-01	5.96E-01	7.95E-01	1.33E-00	5.85E-00	5.95E-00	6.08E+00	6.60E+00	BA	BA	BA	BA	
	003	127.2	5/4	2/4/2010	11:12	8.93E-01	1.62E-02	1.82E-02	4.26E-01	5.79E-01	7.99E-01	-4.37E-00	6.12E-00	5.32E-00	4.21E+00	5.14E+00	BA	BA	BA	BA	
	004	127.2	5/4	4/13/2010	13:13	1.26E-02	1.34E-02	1.47E-02	5.12E-03	3.09E-01	4.91E-01	-2.40E-00	2.92E-00	2.92E-00	1.98E-00	9.22E+00	1.18E+00	1.18E+00	1.18E+00	1.18E+00	
	005	161.7	88.5	7/23/2007	12:46	3.45E-01	1.46E-02	1.95E-02	1.05E-01	4.33E-01	5.27E-01	3.33E-00	1.75E-00	2.35E-00	1.45E+00	1.67E+00	BA	BA	BA	BA	
	006	161.7	88.5	10/12/2007	12:54	4.45E-01	1.49E-02	1.69E-02	6.20E-01	8.10E-01	-1.11E-00	4.47E-00	4.05E-00	-1.01E+00	3.11E						

TABLE 5
HISTORIC GROUNDWATER ANALYTICAL RESULTS
INDIAN POINT ENERGY CENTER
BUCHANAN, TN

Well ID	SAMPLE COLLECTION				TRITIUM (pCi/L)				Sr-90 (pCi/L)				Cs-137 (pCi/L)				Co-60 (pCi/L)				N-63 (pCi/L)				Well ID
	SAMPLE ZONE CENTER, elevation ft below top of casing	SAMPLE ZONE CENTER, depth ft below top of casing	Date	Time	Result	MDC	Std. Dev.	Result	MDC	Std. Dev.	Result	MDC	Std. Dev.	Result	MDC	Std. Dev.	Result	MDC	Std. Dev.	Result	MDC	Std. Dev.			
																							Result	MDC	
NW-51135	009	131.2	67.5	5/7/2009	11:53	2.48E+01	1.43E+02	1.71E+02	8.54E+02	4.71E+01	3.06E+00	7.64E+00	4.69E+00	2.33E+01	3.77E+00	4.00E+00	-2.11E+00	2.24E+01	2.60E+01	2.44E+01	2.40E+01	2.40E+01	1.07E+01	1.07E+01	
	010	131.2	67.5	8/12/2009	11:22	9.81E+01	1.61E+02	1.70E+02	-6.62E+01	4.91E+01	3.06E+00	3.73E+00	3.73E+00	3.73E+00	2.68E+00	3.00E+00	4.22E+00	-1.50E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01		
	011	131.2	67.5	11/18/2009	11:35	1.90E+02	1.32E+02	1.43E+02	-5.62E+01	6.06E+01	8.17E+01	4.53E+00	4.53E+00	5.10E+00	2.08E+00	5.09E+00	6.12E+00	1.08E+00	1.68E+01	1.68E+01	1.68E+01	1.68E+01	1.68E+01		
	012	131.2	67.5	2/5/2010	11:48	4.89E+00	1.71E+02	1.98E+02	7.14E+02	3.99E+01	8.13E+01	5.93E+00	4.33E+00	4.33E+00	4.54E+02	1.10E+00	1.10E+00	1.10E+00	NS	NS	NS	NS	NS	NS	
	013	131.2	67.5	4/8/2010	11:48	3.89E+01	1.13E+02	1.30E+02	-2.09E+02	3.99E+01	7.83E+01	8.73E+00	8.73E+00	8.73E+00	-4.93E+01	1.04E+01	1.04E+01	1.04E+01	NS	NS	NS	NS	NS	NS	
	001	163.7	95	5/9/2007	14:40	1.18E+02	1.56E+02	1.69E+02	3.29E+01	1.16E+00	1.86E+00	2.81E+00	2.81E+00	2.81E+00	1.77E+01	3.20E+00	3.20E+00	3.20E+00	NS	NS	NS	NS	NS	NS	
	002	163.7	95	7/24/2007	14:05	4.98E+01	1.44E+02	1.65E+02	1.05E+01	4.83E+01	1.31E+01	3.40E+00	3.78E+00	8.64E+02	2.35E+00	3.03E+00	3.03E+00	3.03E+00	NS	NS	NS	NS	NS	NS	
	004	163.7	95	11/9/2007	13:32	7.39E+01	1.52E+02	1.81E+02	4.08E+01	2.82E+01	1.41E+01	3.40E+00	3.40E+00	3.40E+00	3.40E+00	3.11E+00	3.11E+00	3.11E+00	NS	NS	NS	NS	NS	NS	
	003	163.7	95	1/8/2008	13:57	1.99E+01	1.47E+02	1.82E+02	2.08E+01	8.22E+01	1.97E+01	2.66E+00	2.66E+00	2.66E+00	8.69E+02	2.15E+00	2.15E+00	2.15E+00	NS	NS	NS	NS	NS	NS	
	006	163.7	95	8/8/2008	11:16	6.92E+01	1.40E+02	1.40E+02	1.22E+01	2.63E+01	5.44E+01	2.23E+00	2.23E+00	2.23E+00	3.78E+01	3.95E+00	3.95E+00	3.95E+00	4.13E+00	1.26E+01	1.26E+01	1.26E+01	1.26E+01	1.26E+01	
007	163.7	95	10/27/2008	11:44	4.69E+01	1.30E+02	1.48E+02	-2.55E+01	5.76E+01	6.47E+01	1.70E+00	6.18E+00	6.75E+00	5.42E+01	1.97E+00	1.97E+00	1.97E+00	2.11E+00	1.38E+01	1.38E+01	1.38E+01	1.38E+01	1.38E+01		
008	163.7	95	12/9/2008	11:44	4.69E+01	1.30E+02	1.48E+02	-2.55E+01	5.76E+01	6.47E+01	1.70E+00	6.18E+00	6.75E+00	5.42E+01	1.97E+00	1.97E+00	1.97E+00	2.11E+00	1.38E+01	1.38E+01	1.38E+01	1.38E+01	1.38E+01		
009	163.7	95	3/7/2009	12:59	3.68E+01	1.58E+02	1.81E+02	-5.45E+02	4.61E+01	6.13E+01	3.50E+00	3.92E+00	3.92E+00	1.08E+00	3.23E+00	3.23E+00	3.23E+00	3.08E+00	-3.79E+00	-3.79E+00	-3.79E+00	-3.79E+00	-3.79E+00		
010	163.7	95	8/12/2009	11:28	4.41E+02	1.62E+02	1.79E+02	2.24E+02	5.79E+01	6.94E+01	3.43E+00	3.43E+00	3.43E+00	2.02E+00	2.02E+00	2.02E+00	2.02E+00	2.02E+00	2.02E+00	2.02E+00	2.02E+00	2.02E+00	2.02E+00		
011	163.7	95	11/18/2009	11:34	6.41E+01	1.75E+02	1.98E+02	8.78E+01	5.76E+01	8.11E+01	3.80E+00	3.80E+00	3.80E+00	1.85E+00	5.71E+00	5.71E+00	5.71E+00	-2.71E+00	1.66E+01	1.66E+01	1.66E+01	1.66E+01	1.66E+01		
012	163.7	95	1/5/2010	11:48	4.19E+01	1.75E+02	1.98E+02	8.78E+01	5.76E+01	8.11E+01	3.80E+00	3.80E+00	3.80E+00	1.85E+00	5.71E+00	5.71E+00	5.71E+00	NS	NS	NS	NS	NS	NS		
013	163.7	95	3/15/2010	11:48	5.33E+01	1.75E+02	1.98E+02	8.78E+01	5.76E+01	8.11E+01	3.80E+00	3.80E+00	3.80E+00	1.85E+00	5.71E+00	5.71E+00	5.71E+00	NS	NS	NS	NS	NS	NS		
014	163.7	95	4/16/2010	11:48	5.33E+01	1.75E+02	1.98E+02	8.78E+01	5.76E+01	8.11E+01	3.80E+00	3.80E+00	3.80E+00	1.85E+00	5.71E+00	5.71E+00	5.71E+00	NS	NS	NS	NS	NS	NS		
015	163.7	95	5/20/2010	11:48	5.33E+01	1.75E+02	1.98E+02	8.78E+01	5.76E+01	8.11E+01	3.80E+00	3.80E+00	3.80E+00	1.85E+00	5.71E+00	5.71E+00	5.71E+00	NS	NS	NS	NS	NS	NS		
016	163.7	95	6/23/2010	11:48	5.33E+01	1.75E+02	1.98E+02	8.78E+01	5.76E+01	8.11E+01	3.80E+00	3.80E+00	3.80E+00	1.85E+00	5.71E+00	5.71E+00	5.71E+00	NS	NS	NS	NS	NS	NS		
017	163.7	95	7/24/2010	11:48	5.33E+01	1.75E+02	1.98E+02	8.78E+01	5.76E+01	8.11E+01	3.80E+00	3.80E+00	3.80E+00	1.85E+00	5.71E+00	5.71E+00	5.71E+00	NS	NS	NS	NS	NS	NS		
018	163.7	95	8/24/2010	11:48	5.33E+01	1.75E+02	1.98E+02	8.78E+01	5.76E+01	8.11E+01	3.80E+00	3.80E+00	3.80E+00	1.85E+00	5.71E+00	5.71E+00	5.71E+00	NS	NS	NS	NS	NS	NS		
019	163.7	95	9/23/2010	11:48	5.33E+01	1.75E+02	1.98E+02	8.78E+01	5.76E+01	8.11E+01	3.80E+00	3.80E+00	3.80E+00	1.85E+00	5.71E+00	5.71E+00	5.71E+00	NS	NS	NS	NS	NS	NS		
020	163.7	95	10/22/2010	11:48	5.33E+01	1.75E+02	1.98E+02	8.78E+01	5.76E+01	8.11E+01	3.80E+00	3.80E+00	3.80E+00	1.85E+00	5.71E+00	5.71E+00	5.71E+00	NS	NS	NS	NS	NS	NS		
021	163.7	95	11/18/2010	11:48	5.33E+01	1.75E+02	1.98E+02	8.78E+01	5.76E+01	8.11E+01	3.80E+00	3.80E+00	3.80E+00	1.85E+00	5.71E+00	5.71E+00	5.71E+00	NS	NS	NS	NS	NS	NS		
022	163.7	95	12/15/2010	11:48	5.33E+01	1.75E+02	1.98E+02	8.78E+01	5.76E+01	8.11E+01	3.80E+00	3.80E+00	3.80E+00	1.85E+00	5.71E+00	5.71E+00	5.71E+00	NS	NS	NS	NS	NS	NS		
023	163.7	95	1/5/2011	11:48	5.33E+01	1.75E+02	1.98E+02	8.78E+01	5.76E+01	8.11E+01	3.80E+00	3.80E+00	3.80E+00	1.85E+00	5.71E+00	5.71E+00	5.71E+00	NS	NS	NS	NS	NS	NS		
024	163.7	95	2/2/2011	11:48	5.33E+01	1.75E+02	1.98E+02	8.78E+01	5.76E+01	8.11E+01	3.80E+00	3.80E+00	3.80E+00	1.85E+00	5.71E+00	5.71E+00	5.71E+00	NS	NS	NS	NS	NS	NS		
025	163.7	95	2/23/2011	11:48	5.33E+01	1.75E+02	1.98E+02	8.78E+01	5.76E+01	8.11E+01	3.80E+00	3.80E+00	3.80E+00	1.85E+00	5.71E+00	5.71E+00	5.71E+00	NS	NS	NS	NS	NS	NS		
026	163.7	95	3/15/2011	11:48	5.33E+01	1.75E+02	1.98E+02	8.78E+01	5.76E+01	8.11E+01	3.80E+00	3.80E+00	3.80E+00	1.85E+00	5.71E+00	5.71E+00	5.71E+00	NS	NS	NS	NS	NS	NS		
027	163.7	95	4/16/2011	11:48	5.33E+01	1.75E+02	1.98E+02	8.78E+01	5.76E+01	8.11E+01	3.80E+00	3.80E+00	3.80E+00	1.85E+00	5.71E+00	5.71E+00	5.71E+00	NS	NS	NS	NS	NS	NS		
028	163.7	95	5/17/2011	11:48	5.33E+01	1.75E+02	1.98E+02	8.78E+01	5.76E+01	8.11E+01	3.80E+00	3.80E+00	3.80E+00	1.85E+00	5.71E+00	5.71E+00	5.71E+00	NS	NS	NS	NS	NS	NS		
029	163.7	95	6/14/2011	11:48	5.33E+01	1.75E+02	1.98E+02	8.78E+01	5.76E+01	8.11E+01	3.80E+00	3.80E+00	3.80E+00	1.85E+00	5.71E+00	5.71E+00	5.71E+00	NS	NS	NS	NS	NS	NS		
030	163.7	95	7/12/2011	11:48	5.33E+01	1.75E+02	1.98E+02	8.78E+01	5.76E+01	8.11E+01	3.80E+00	3.80E+00	3.80E+00	1.85E+00	5.71E+00	5.71E+00	5.71E+00	NS	NS	NS	NS	NS	NS		
031	163.7	95	8/9/2011	11:48	5.33E+01	1.75E+02	1.98E+02	8.78E+01	5.76E+01	8.11E+01	3.80E+00	3.80E+00	3.80E+00	1.85E+00	5.71E+00	5.71E+00	5.71E+00	NS	NS	NS	NS	NS	NS		
032	163.7	95	9/6/2011	11:48	5.33E+01	1.75E+02	1.98E+02	8.78E+01	5.76E+01	8.11E+01	3.80E+00	3.80E+00	3.80E+00	1.85E+00	5.71E+00	5.71E+00	5.71E+00	NS	NS	NS	NS	NS	NS		
033	163.7	95	10/3/2011	11:48	5.33E+01	1.75E+02	1.98E+02	8.78E+01	5.76E+01	8.11E+01	3.80E+00	3.80E+00	3.80E+00	1.85E+00	5.71E+00	5.71E+00	5.71E+00	NS	NS	NS	NS	NS	NS		
034	163.7	95	10/31/2011	11:48	5.33E+01	1.75E+02	1.98E+02	8.78E+01	5.76E+01	8.11E+01	3.80E+00	3.80E+00	3.80E+00	1.85E+00	5.71E+00	5.71E+00	5.71E+00	NS	NS	NS	NS	NS	NS		
035	163.7	95	11/28/2011	11:48	5.33E+01	1.75E+02	1.98E+02	8.78E+01	5.76E+01	8.11E+01	3.80E+00	3.80E+00	3.80E+00	1.85E+00	5.71E+00	5.71E+00	5.71E+00	NS	NS	NS	NS	NS	NS		
036	163.7	95	12/15/2011	11:48	5.33E+01	1.75E+02	1.98E+02	8.78E+01	5.76E+01	8.11E+01	3.80E+00	3.80E+00	3.80E+00	1.85E+00	5.71E+00	5.71E+00	5.71E+00	NS	NS	NS	NS				

TABLE 5
HISTORIC GROUNDWATER ANALYTICAL RESULTS
INDIAN POINT ENERGY CENTER
BUCHANAN, NY

Well ID	SAMPLE ZONE CENTER, elevation ft below top of casing	SAMPLE COLLECTION			ANALYSIS RESULTS										Well ID					
		Date	Time	MDC	TRITIUM (pCi/L)		Sr-90 (pCi/L)		Cs-137 (pCi/L)		Co-60 (pCi/L)		Np-237 (pCi/L)			MDC				
					Result	Std. Dev.	Result	Std. Dev.	Result	Std. Dev.	Result	Std. Dev.	Result	Std. Dev.			Result	Std. Dev.		
MW-54113	002	123	10/29	7/31/2007	11310	9.63E+02	3.60E+02	1.35E+01	1.47E+00	8.57E-01	0.00E+00	4.69E+00	4.09E+00	2.96E+00	4.02E+00	5.06E+00	3.63E+00	2.17E+01	1.67E+11.13	
	003	123	10/29	10/19/2007	12609	7.08E+02	3.87E+02	1.16E+01	1.88E+00	8.13E-01	4.02E+02	3.51E+00	3.88E+00	4.72E+00	4.11E+00	3.00E+00	3.42E+00	2.23E+01	2.58E+01	
	004	123	10/29	1/13/2008	10652	5.33E+02	4.23E+02	9.50E+00	1.92E+00	7.11E-01	8.23E-01	3.46E+00	3.94E+00	4.41E+00	3.00E+00	3.42E+00	2.62E+00	2.23E+01	2.58E+01	
	005	123	10/29	5/2/2008	10906	6.98E+02	1.33E+02	6.45E+00	3.46E+01	5.98E+01	1.23E+00	3.74E+00	3.74E+00	4.11E+00	3.74E+00	3.21E+00	3.15E+00	2.08E+00	2.73E+01	2.73E+01
	006	123	10/29	7/22/2008	11330	6.14E+02	9.77E+01	1.21E+02	6.24E+00	8.15E+01	2.82E+01	2.22E+00	3.42E+00	2.54E+00	2.54E+00	3.21E+00	3.21E+00	4.43E+00	1.57E+01	2.73E+01
	007	123	10/29	11/11/2008	11553	5.80E+02	1.77E+02	1.10E+00	7.26E+01	5.70E+01	6.02E+01	3.14E+00	5.51E+00	2.63E+00	2.63E+00	4.09E+00	3.62E+00	4.88E+00	1.83E+01	2.13E+01
	008	123	10/29	2/2/2009	11185	3.13E+02	1.64E+02	5.91E+00	1.15E+00	1.00E+00	5.03E+01	3.02E+00	3.95E+00	5.33E+00	5.33E+00	3.32E+00	3.32E+00	9.09E+00	2.00E+01	2.00E+01
	009	123	10/29	8/6/2009	12430	6.59E+02	2.28E+02	3.43E+00	1.24E+00	7.96E+01	6.38E+01	3.90E+00	4.00E+00	2.36E+00	3.27E+00	3.76E+00	3.91E+00	1.79E+00	2.11E+01	2.11E+01
	010	123	10/29	11/13/2009	14559	7.49E+02	2.04E+02	3.77E+00	1.13E+00	8.78E+01	1.12E+01	1.25E+01	7.48E+00	8.01E+00	6.15E+00	5.33E+00	6.09E+00	1.31E+01	2.18E+01	2.18E+01
	011	123	10/29	2/11/2010	11132	8.75E+02	1.71E+02	3.40E+00	1.13E+00	7.94E+01	1.87E+00	5.45E+00	6.02E+00	5.78E+00	5.78E+00	4.91E+00	1.79E+00	1.79E+00	2.60E+01	2.60E+01
MW-54114	001	124	10/29	5/2/2007	11588	9.10E+02	2.09E+02	2.25E+00	1.12E+00	8.15E+01	1.12E+00	3.02E+00	3.02E+00	3.02E+00	9.62E+00	1.09E+01	4.51E+00	1.99E+01	2.35E+01	
	002	124	10/29	7/31/2007	11331	1.89E+03	5.67E+02	1.22E+00	1.98E+00	6.71E+01	1.19E+00	2.92E+00	3.02E+00	3.02E+00	5.02E+00	3.33E+00	3.72E+00	4.54E+00	1.89E+01	2.23E+01
	003	124	10/29	1/13/2008	11037	1.46E+03	4.15E+02	1.37E+00	1.87E+00	8.88E+01	6.78E+01	3.49E+00	3.49E+00	3.49E+00	3.49E+00	4.31E+00	9.10E+00	2.16E+01	2.16E+01	
	004	124	10/29	5/2/2008	11537	1.40E+03	5.43E+02	1.57E+00	1.57E+00	8.88E+01	6.78E+01	3.49E+00	3.49E+00	3.49E+00	3.49E+00	4.31E+00	9.10E+00	2.16E+01	2.16E+01	
	005	124	10/29	7/22/2008	10230	1.13E+03	1.13E+02	1.89E+01	1.21E+00	7.03E+01	9.43E+01	2.26E+00	2.63E+00	1.60E+00	2.27E+00	3.63E+00	2.03E+00	2.03E+00	2.11E+01	2.11E+01
	006	124	10/29	2/2/2009	15338	1.13E+03	1.13E+02	1.89E+01	1.21E+00	7.03E+01	9.43E+01	2.26E+00	2.63E+00	1.60E+00	2.27E+00	3.63E+00	2.03E+00	2.03E+00	2.11E+01	2.11E+01
	007	124	10/29	11/11/2009	11846	1.14E+03	2.03E+02	1.23E+00	2.27E+00	4.99E+01	6.18E+01	3.09E+00	3.09E+00	5.67E+01	5.17E+00	5.95E+00	4.88E+00	2.09E+01	2.09E+01	
	008	124	10/29	2/2/2010	12441	1.13E+03	2.03E+02	1.23E+00	2.27E+00	4.99E+01	6.18E+01	3.09E+00	3.09E+00	5.67E+01	5.17E+00	5.95E+00	4.88E+00	2.09E+01	2.09E+01	
	009	124	10/29	5/6/2010	10223	1.43E+03	2.91E+02	1.46E+01	1.89E+00	5.93E+01	5.93E+01	4.97E+00	3.33E+00	3.33E+00	9.27E+01	3.33E+00	3.90E+00	5.83E+00	1.91E+01	2.21E+01
	010	124	10/29	8/6/2010	11110	1.42E+03	2.18E+02	1.41E+01	1.74E+00	7.92E+01	6.70E+01	4.91E+00	3.33E+00	3.33E+00	1.71E+00	3.60E+00	1.41E+01	2.22E+01	2.22E+01	
MW-54117	001	124	10/29	11/12/2007	10377	1.20E+03	2.88E+02	2.03E+02	1.83E+00	1.83E+00	1.83E+00	4.88E+00	4.88E+00	4.88E+00	1.71E+00	3.12E+00	2.42E+00	5.64E+00	1.92E+01	2.24E+01
	002	124	10/29	2/10/2010	10377	1.20E+03	1.83E+02	1.44E+01	2.07E+00	7.00E+01	5.02E+01	9.22E+00	1.01E+01	1.71E+00	7.62E+00	7.26E+00	1.11E+00	1.11E+00	2.24E+01	2.24E+01
	003	124	10/29	5/2/2010	11431	1.28E+03	2.40E+02	1.45E+00	2.04E+00	6.93E+01	1.08E+00	2.11E+00	2.11E+00	4.60E+00	3.03E+00	6.97E+00	6.97E+00	2.11E+01	2.11E+01	
	004	124	10/29	7/31/2007	11431	1.50E+03	6.27E+02	4.71E+00	2.09E+00	8.31E+01	4.53E+01	3.83E+00	4.16E+00	1.92E+00	3.46E+00	4.27E+00	5.00E+00	1.94E+01	2.21E+01	2.21E+01
	005	124	10/29	1/13/2008	11340	2.08E+03	5.94E+02	2.68E+02	1.45E+00	1.85E+00	1.85E+00	2.63E+00	3.10E+00	3.10E+00	7.58E+00	2.74E+00	3.92E+00	1.81E+01	2.07E+01	
	006	124	10/29	10/19/2007	12314	1.91E+03	5.07E+02	3.63E+02	1.49E+00	2.07E+00	1.05E+00	3.29E+00	3.79E+00	3.08E+01	2.87E+00	3.18E+00	1.77E+00	1.69E+01	1.70E+01	
	007	124	10/29	1/13/2008	11133	1.89E+03	5.84E+02	4.10E+02	1.41E+00	1.80E+00	9.99E+01	3.68E+01	2.21E+00	3.08E+00	5.21E+00	3.00E+00	4.01E+00	2.30E+01	2.63E+01	
	008	124	10/29	5/2/2008	10435	2.11E+03	2.10E+02	1.22E+00	1.18E+00	9.98E+01	6.14E+01	2.22E+00	3.66E+00	3.66E+00	1.71E+00	2.00E+00	4.73E+00	1.20E+01	1.20E+01	
	009	124	10/29	7/22/2008	11531	2.05E+03	1.35E+02	1.29E+00	1.08E+00	5.53E+01	4.62E+02	2.07E+00	3.52E+00	3.52E+00	1.62E+00	2.11E+00	3.13E+00	7.88E+00	1.22E+01	1.22E+01
	010	124	10/29	1/11/2008	11339	1.66E+03	4.28E+02	3.31E+00	1.12E+00	5.21E+01	1.12E+00	4.28E+00	4.28E+00	3.31E+00	3.31E+00	3.31E+00	3.31E+00	3.31E+00	3.31E+00	3.31E+00
MW-54118	001	124	10/29	5/2/2007	10234	1.57E+03	3.03E+02	2.80E+02	1.60E+00	1.60E+00	1.60E+00	3.15E+00	3.15E+00	1.07E+00	2.63E+00	3.14E+00	1.32E+00	1.32E+00	3.03E+01	3.03E+01
	002	124	10/29	8/6/2007	11515	1.87E+03	3.48E+02	2.74E+00	1.51E+00	7.94E+01	1.46E+00	3.37E+00	3.07E+00	3.07E+00	3.07E+00	3.14E+00	3.69E+00	1.10E+01	1.10E+01	
	003	124	10/29	11/13/2007	12304	1.83E+03	3.13E+02	2.03E+02	1.43E+00	1.93E+00	7.16E+01	3.02E+00	3.02E+00	1.35E+00	2.73E+00	6.84E+00	1.70E+00	1.91E+01	2.00E+01	
	004	124	10/29	2/10/2010	10834	1.61E+03	2.00E+02	1.53E+00	1.53E+00	7.16E+01	2.09E+00	6.31E+00	6.31E+00	6.31E+00	7.62E+00	6.72E+00	5.09E+00	2.13E+01	2.13E+01	
	005	124	10/29	5/2/2010	11447	2.03E+03	2.84E+02	1.42E+00	1.42E+00	5.94E+01	3.67E+01	8.87E+00	9.74E+00	2.77E+00	7.62E+00	9.74E+00	1.68E+00	2.02E+01	2.02E+01	
	006	124	10/29	8/6/2010	11500	1.87E+03	6.21E+02	4.71E+00	1.93E+00	7.90E+01	1.82E+00	9.00E+00	9.00E+00	3.22E+00	2.90E+00	3.20E+00	1.54E+00	1.88E+01	1.88E+01	
	007	124	10/29	1/13/2008	11345	2.23E+03	6.12E+02	2.69E+02	1.79E+00	7.99E+01	2.13E+00	3.33E+00	3.12E+00	9.32E+01	2.90E+00	3.67E+00	3.67E+00	1.66E+01	1.66E+01	
	008	124	10/29	10/19/2007	12220	2.13E+03	5.24E+02	3.69E+02	2.94E+00	2.46E+00	7.97E+01	1.05E+00	3.07E+00	3.07E+00	7.41E+00	4.05E+00	3.33E+00	3.33E+00	1.71E+01	1.71E+01
	009	124	10/29	1/13/2008	11337	2.24E+03	6.26E+02	4.18E+02	1.92E+00	2.58E+00	8.15E+01	2.64E+00	3.11E+00	2.88E+01	2.88E+01	2.88E+01	2.88E+01	2.42E+01	2.42E+01	
	010	124	10/29	5/2/2008	10430	1.84E+03	1.98E+02	1.48E+00	1.40E+00	7.88E+01	6.43E+01	1.58E+00	3.46E+00	3.46E+00	8.81E+01	1.95E+00	3.51E+00	3.51E+00	2.13E+01	2.13E+01
MW-54119	001	124	10/29	7/22/2008	11550	1.48E+03	2.10E+02	1.13E+00	1.37E+00	6.50E+01	8.43E+01	1.58E+00	3.41E+00	1.64E+00	2.66E+00	3.02E+00	4.82E+00	1.61E+01	1.61E+01	
	002	124	10/29	11/11/2008	11559	1.48E+03	2.10E+02	1.13E+00	1.37E+00	6.50E+01	8.43E+01	1.58E+00	3.41E+00	1.64E+00	2.66E+00	3.02E+00	4.82E+00	1.61E+01	1.61E+01	
	003	124	10/29	2/2/2009	12333	1.43E+03	4.88E+02	3.38E+00	1.12E+00	6.00E+01	1.18E+00	3.48E+00	3.48E+00	7.39E+01	3.08E+00	3.70E+00	5.10E+00	2.37E+01	2.37E+01	
	004	124	10/29	5/6/2009	10273	1.60E+03	3.05E+02	1.89E+00	2.97E+00	4.19E+01	2.31E+00	7.22E+00	4.81E+00	4.81E+00	3.86E+00	4.04E+00	1.94E+01	1.94E+01		
	005	124	10/29	8/6/2009	11230	1.90E+03	3.62E+02	2.58E+00	2.90E+00	6.71E+01	2.79E+01	3.31E+00	3.53E+00	9.28E+01	3.99E+00	4.59E+00	1.51E+00	1.51E+00		
	006	124	10/29																	

TABLE 5
HISTORIC GROUNDWATER ANALYTICAL RESULTS
INDIAN POINT ENERGY CENTER
BUCHANAN, TN

Well ID	SAMPLE ZONE CENTER, elevation ft w.r.t. top of casing	SAMPLE COLLECTION			ANALYSIS RESULTS												Well ID			
		Date	Time	Thru	TRITIUM (pCi/L)			Sr-90 (pCi/L)			Cs-137 (pCi/L)			Co-60 (pCi/L)				N-63 (pCi/L)		
					Result	MDC	Std. Dev.	Result	MDC	Std. Dev.	Result	MDC	Std. Dev.	Result	MDC	Std. Dev.		Result	MDC	Std. Dev.
MW-55-24	011	16	2.3	1.99E+03	3.09E+02	2.37E+02	3.07E+01	2.53E+00	7.22E-01	7.00E-01	3.74E+00	3.61E+00	1.05E+00	2.92E+00	3.53E+00	2.48E+00	2.49E+01	2.09E+01	MW-55-24	
	012	16	2.3	1.88E+03	2.47E+02	1.88E+02	1.93E+01	1.95E+00	7.99E-01	1.03E-01	3.74E+00	3.59E+00	3.87E+00	5.03E+00	7.18E+00	7.44E+00	1.80E+01	1.80E+01	MW-55-24	
	013	16	2.3	2.18E+03	2.49E+02	1.88E+02	2.06E+01	2.06E+00	7.88E-01	4.90E-01	3.74E+00	3.59E+00	7.07E+01	4.32E+00	4.92E+00	8.60E+00	1.86E+01	1.86E+01	MW-55-24	
	014	16	2.3	4.21E+03	1.63E+02	3.09E+02	4.94E+01	4.80E+00	8.38E-01	-5.91E+00	3.74E+00	3.60E+00	6.66E+01	9.22E+00	1.10E+00	7.52E+01	1.79E+01	2.07E+01	MW-55-24	
	001	32	-13.8	1.19E+03	1.03E+03	4.00E+02	4.94E+01	4.80E+00	9.74E-01	-1.10E+00	3.74E+00	3.74E+00	3.74E+00	3.74E+00	4.10E+00	3.40E+00	3.80E+00	3.80E+00	MW-55-24	
	002	32	-13.8	8.29E+02	2.93E+02	1.84E+02	3.25E+01	3.25E+00	9.74E-01	-4.64E+01	3.74E+00	3.74E+00	3.74E+00	3.74E+00	3.74E+00	3.74E+00	3.74E+00	3.74E+00	MW-55-24	
	003	32	-13.8	8.29E+02	2.93E+02	1.84E+02	3.25E+01	3.25E+00	9.74E-01	-4.64E+01	3.74E+00	3.74E+00	3.74E+00	3.74E+00	3.74E+00	3.74E+00	3.74E+00	3.74E+00	MW-55-24	
	004	32	-13.8	1.01E+03	3.09E+02	3.09E+02	3.16E+01	3.04E+00	1.04E+01	2.52E+01	3.74E+00	3.88E+00	1.44E+00	3.44E+00	2.70E+00	1.96E+01	2.38E+01	2.38E+01	MW-55-24	
	005	32	-13.8	1.28E+03	4.59E+02	2.97E+02	3.44E+01	3.04E+00	-5.38E-01	1.21E+00	3.74E+00	2.65E+00	6.50E+01	2.19E+00	4.20E+00	1.12E+01	1.76E+01	1.96E+01	MW-55-24	
	006	32	-13.8	4.25E+02	1.86E+02	1.43E+02	3.44E+01	1.86E+00	6.11E-01	1.46E+00	3.74E+00	4.06E+00	2.31E+00	2.40E+00	4.61E+00	5.23E+00	1.21E+01	2.14E+01	MW-55-24	
MW-55-25	007	32	-13.8	1.73E+03	2.08E+02	1.91E+02	4.38E+01	1.42E+00	3.31E+01	3.11E+00	3.74E+00	3.74E+00	3.74E+00	3.74E+00	3.74E+00	3.74E+00	3.74E+00	3.74E+00	MW-55-25	
	008	32	-13.8	2.02E+03	2.48E+02	1.88E+02	4.99E+01	1.82E+00	4.99E+01	1.01E+00	3.74E+00	3.69E+00	3.69E+00	3.69E+00	3.69E+00	3.69E+00	3.69E+00	3.69E+00	MW-55-25	
	009	32	-13.8	4.29E+02	1.88E+02	1.88E+02	3.31E+01	2.92E+00	6.95E-01	-1.08E+00	3.74E+00	3.62E+00	5.97E+01	4.28E+00	5.04E+00	7.51E+00	2.03E+01	2.03E+01	MW-55-25	
	010	32	-13.8	2.83E+03	4.19E+02	4.14E+01	2.88E+00	2.88E+00	7.28E-01	-1.22E+00	3.74E+00	3.62E+00	3.62E+00	3.62E+00	3.62E+00	3.62E+00	3.62E+00	3.62E+00	MW-55-25	
	011	32	-13.8	1.48E+03	1.48E+02	1.48E+02	3.31E+01	3.31E+00	7.28E-01	-1.22E+00	3.74E+00	3.62E+00	3.62E+00	3.62E+00	3.62E+00	3.62E+00	3.62E+00	3.62E+00	MW-55-25	
	012	32	-13.8	2.16E+03	2.65E+02	1.71E+02	3.03E+01	3.03E+00	7.15E-01	-5.17E+00	3.74E+00	3.62E+00	3.62E+00	3.62E+00	3.62E+00	3.62E+00	3.62E+00	3.62E+00	MW-55-25	
	013	32	-13.8	1.01E+03	1.01E+02	1.01E+02	3.03E+01	3.03E+00	7.15E-01	-5.17E+00	3.74E+00	3.62E+00	3.62E+00	3.62E+00	3.62E+00	3.62E+00	3.62E+00	3.62E+00	MW-55-25	
	014	32	-13.8	1.01E+03	1.01E+02	1.01E+02	3.03E+01	3.03E+00	7.15E-01	-5.17E+00	3.74E+00	3.62E+00	3.62E+00	3.62E+00	3.62E+00	3.62E+00	3.62E+00	3.62E+00	MW-55-25	
	015	32	-13.8	6.22E+02	1.84E+02	1.84E+02	2.47E+01	2.47E+00	9.55E-01	1.00E+00	3.74E+00	3.80E+00	3.20E+00	4.50E+00	5.70E+00	4.80E+00	4.80E+00	4.80E+00	MW-55-25	
	016	32	-13.8	8.22E+02	1.90E+02	1.90E+02	2.47E+01	2.47E+00	9.55E-01	1.00E+00	3.74E+00	3.80E+00	3.20E+00	4.50E+00	5.70E+00	4.80E+00	4.80E+00	4.80E+00	MW-55-25	
MW-55-26	001	47	-28.8	1.03E+04	1.19E+03	5.51E+02	2.21E+01	2.35E+00	9.10E-01	-1.09E+00	3.74E+00	3.80E+00	1.46E+00	3.27E+00	3.48E+00	3.55E+00	3.98E+01	2.38E+01	MW-55-26	
	002	47	-28.8	6.22E+02	1.84E+02	1.84E+02	2.47E+01	2.47E+00	9.55E-01	1.00E+00	3.74E+00	3.80E+00	3.20E+00	4.50E+00	5.70E+00	4.80E+00	4.80E+00	MW-55-26		
	003	47	-28.8	1.03E+04	1.19E+03	5.51E+02	2.21E+01	2.35E+00	9.10E-01	-1.09E+00	3.74E+00	3.80E+00	1.46E+00	3.27E+00	3.48E+00	3.55E+00	3.98E+01	2.38E+01	MW-55-26	
	004	47	-28.8	1.03E+04	1.19E+03	5.51E+02	2.21E+01	2.35E+00	9.10E-01	-1.09E+00	3.74E+00	3.80E+00	1.46E+00	3.27E+00	3.48E+00	3.55E+00	3.98E+01	2.38E+01	MW-55-26	
	005	47	-28.8	1.28E+03	1.13E+02	2.97E+02	2.28E+01	2.40E+00	5.99E-01	-8.77E-01	3.74E+00	3.02E+00	3.63E+00	2.81E+00	1.99E+01	2.02E+00	1.86E+01	2.02E+01	MW-55-26	
	006	47	-28.8	3.96E+03	3.96E+02	1.44E+02	2.57E+01	1.62E+00	6.96E-01	-1.74E+00	3.74E+00	4.23E+00	1.63E+00	2.95E+00	4.73E+00	7.99E+00	1.23E+01	2.13E+01	MW-55-26	
	007	47	-28.8	8.12E+02	1.03E+02	1.91E+02	2.24E+01	1.36E+00	3.56E-01	6.53E+00	3.74E+00	3.52E+00	3.52E+00	3.52E+00	3.52E+00	3.52E+00	3.52E+00	3.52E+00	MW-55-26	
	008	47	-28.8	1.02E+03	6.65E+02	1.94E+01	2.73E+00	6.23E-01	-3.17E+00	5.29E+00	3.74E+00	3.72E+00	3.72E+00	3.72E+00	3.72E+00	3.72E+00	3.72E+00	3.72E+00	MW-55-26	
	009	47	-28.8	2.61E+03	9.09E+02	3.82E+02	3.34E+01	2.01E+00	3.69E-01	3.31E+00	3.74E+00	3.46E+00	3.46E+00	3.46E+00	3.46E+00	3.46E+00	3.46E+00	3.46E+00	MW-55-26	
	010	47	-28.8	4.29E+02	1.86E+02	1.86E+02	3.37E+01	2.45E+00	6.88E-01	3.95E+01	3.74E+00	4.62E+00	4.62E+00	4.62E+00	4.62E+00	4.62E+00	4.62E+00	4.62E+00	MW-55-26	
MW-55-27	001	47	-28.8	5.47E+03	5.45E+02	2.33E+02	2.83E+01	2.42E+00	6.13E-01	-1.10E+00	3.74E+00	3.74E+00	3.74E+00	3.74E+00	3.74E+00	3.74E+00	3.74E+00	3.74E+00	MW-55-27	
	002	47	-28.8	1.12E+03	1.87E+02	1.74E+02	2.33E+01	2.12E+00	4.70E-01	1.23E+00	3.74E+00	3.69E+00	3.69E+00	3.69E+00	3.69E+00	3.69E+00	3.69E+00	3.69E+00	MW-55-27	
	003	47	-28.8	8.23E+03	1.46E+02	3.88E+02	2.23E+01	2.31E+00	8.88E-01	-5.23E+00	3.74E+00	4.20E+00	4.20E+00	4.20E+00	4.20E+00	4.20E+00	4.20E+00	4.20E+00	MW-55-27	
	004	47	-28.8	1.12E+03	1.87E+02	1.74E+02	2.33E+01	2.12E+00	4.70E-01	1.23E+00	3.74E+00	3.69E+00	3.69E+00	3.69E+00	3.69E+00	3.69E+00	3.69E+00	3.69E+00	MW-55-27	
	005	47	-28.8	3.80E+02	1.46E+02	1.46E+02	3.00E+01	3.00E+00	8.29E-01	1.36E+01	3.74E+00	3.74E+00	3.74E+00	3.74E+00	3.74E+00	3.74E+00	3.74E+00	3.74E+00	MW-55-27	
	006	47	-28.8	1.86E+03	1.86E+02	1.86E+02	4.66E+01	4.66E+00	9.31E-01	8.31E+01	3.74E+00	3.74E+00	3.74E+00	3.74E+00	3.74E+00	3.74E+00	3.74E+00	3.74E+00	MW-55-27	
	007	47	-28.8	1.27E+02	1.27E+02	1.27E+02	3.00E+01	3.00E+00	9.31E-01	8.31E+01	3.74E+00	3.74E+00	3.74E+00	3.74E+00	3.74E+00	3.74E+00	3.74E+00	3.74E+00	MW-55-27	
	008	47	-28.8	1.12E+03	1.87E+02	1.74E+02	2.33E+01	2.12E+00	4.70E-01	1.23E+00	3.74E+00	3.69E+00	3.69E+00	3.69E+00	3.69E+00	3.69E+00	3.69E+00	3.69E+00	MW-55-27	
	009	47	-28.8	1.12E+03	1.87E+02	1.74E+02	2.33E+01	2.12E+00	4.70E-01	1.23E+00	3.74E+00	3.69E+00	3.69E+00	3.69E+00	3.69E+00	3.69E+00	3.69E+00	3.69E+00	MW-55-27	
	010	47	-28.8	1.12E+03	1.87E+02	1.74E+02	2.33E+01	2.12E+00	4.70E-01	1.23E+00	3.74E+00	3.69E+00	3.69E+00	3.69E+00	3.69E+00	3.69E+00	3.69E+00	3.69E+00	MW-55-27	
MW-55-28	001	47	-28.8	1.12E+03	1.87E+02	1.74E+02	2.33E+01	2.12E+00	4.70E-01	1.23E+00	3.74E+00	3.69E+00	3.69E+00	3.69E+00	3.69E+00	3.69E+00	3.69E+00	3.69E+00	MW-55-28	
	002	47	-28.8	1.12E+03	1.87E+02	1.74E+02	2.33E+01	2.12E+00	4.70E-01	1.23E+00	3.74E+00	3.69E+00	3.69E+00	3.69E+00	3.69E+00	3.69E+00	3.69E+00	3.69E+00	MW-55-28	
	003	47	-28.8	1.12E+03	1.87E+02	1.74E+02	2.33E+01	2.12E+00	4.70E-01	1.23E+00	3.74E+00	3.69E+00	3.69E+00	3.69E+00	3.69E+00	3.69E+00	3.69E+00	3.69E+00	MW-55-28	
	004	47	-28.8	1.12E+03	1.87E+02	1.74E+02	2.33E+01	2.12E+00	4.70E-01	1.23E+00	3.74E+00	3.69E+00	3.69E+00	3.69E+00	3.69E+00	3.69E+00	3.69E+00	3.69E+00	MW-55-28	
	005	47	-28.8	1.12E+03	1.87E+02	1.74E+02	2.33E+01	2.12E+00	4.70E-01	1.23E+00	3.74E+00	3.69E+00	3.69E+00	3.69E+00	3.69E+00	3.69E+00	3.69E+00	3.69E+00	MW-55-28	
	006	47	-28.8	1.12E+03	1.87E+02	1.74E+02	2.33E+01	2.12E+00	4.70E-01	1.23E+00	3.74E+00	3.69E+00	3.69E+00	3.69E+00	3.69E+00	3.69E+00	3.69E+00	3.69E+00	MW-55-28	
	007	47	-28.8	1.12E+03	1.87E+02															

TABLE 5
HISTORIC GROUNDWATER ANALYTICAL RESULTS
INDIAN POINT ENERGY CENTER
BUCHANAN, NY

Well ID ¹	SAMPLE ZONE CENTER, elevation ft below top of casing ²	SAMPLE COLLECTION			ANALYSIS RESULTS												Well ID ¹	
		Date	Time	MDC	TRITIUM (pCi/L)			Sr-90 (pCi/L)			Co-60 (pCi/L)			N-63 (pCi/L)				
					Result	Std Dev.	UCL	Result	Std Dev.	UCL	Result	Std Dev.	UCL	Result	Std Dev.	UCL		
MW-66-53	009	53.4	-60.9	4/9/2009	10:08	1.12E+02	1.75E+02	6.40E+02	5.75E-01	7.23E-01	8.02E-01	3.64E+00	7.69E+00	3.48E+00	7.81E+00	2.39E+01	2.81E+01	MW-66-53
	010	53.4	-60.9	8/11/2008	14:26	2.03E+02	1.56E+02	1.01E+02	7.18E-01	1.11E+00	8.09E-01	4.62E+00	5.33E+00	4.62E+00	3.41E+00	3.41E+00	2.60E+01	2.60E+01
	011	53.4	-60.9	10/30/2009	14:19	1.47E+02	1.47E+02	1.24E+01	4.93E-01	6.12E-01	7.00E-01	2.86E+00	3.38E+00	3.38E+00	2.60E+00	2.60E+00	2.27E+01	2.27E+01
	012	53.4	-60.9	3/19/2010	11:07	1.37E+02	1.59E+02	1.14E+02	5.66E-01	7.00E-01	7.00E-01	4.92E+00	4.92E+00	4.92E+00	4.92E+00	4.92E+00	5.31E+00	5.31E+00
	013	53.4	-60.9	3/19/2010	16:31	2.45E+02	1.58E+02	1.41E+02	9.87E-02	8.10E-01	7.58E-01	8.18E+00	8.18E+00	8.18E+00	8.18E+00	8.18E+00	9.02E+00	9.02E+00
	001	72.4	-59.9	3/8/2007	12:17	9.26E+02	1.52E+02	2.87E+02	3.13E-01	1.61E+00	1.61E+00	3.43E+00	3.43E+00	3.43E+00	3.43E+00	3.43E+00	8.28E+00	8.28E+00
	002	72.4	-59.9	7/27/2007	13:22	1.10E+02	1.65E+02	1.81E+02	3.71E-01	4.92E+01	5.00E+01	1.01E+00	1.01E+00	1.01E+00	1.01E+00	1.01E+00	3.17E+00	3.17E+00
	003	72.4	-59.9	10/9/2007	14:15	1.28E+02	1.43E+02	1.64E+01	5.00E-01	7.12E-01	7.12E-01	4.82E+00	4.82E+00	4.82E+00	4.82E+00	4.82E+00	3.41E+00	3.41E+00
	004	72.4	-59.9	1/14/2008	14:12	1.36E+02	1.65E+02	1.78E+02	5.00E-01	7.12E-01	7.12E-01	4.82E+00	4.82E+00	4.82E+00	4.82E+00	4.82E+00	3.41E+00	3.41E+00
	005	72.4	-59.9	4/24/2008	12:20	1.65E+02	1.17E+02	3.08E+01	4.82E-01	8.38E-01	8.38E-01	2.37E+00	2.37E+00	2.37E+00	2.37E+00	2.37E+00	3.75E+00	3.75E+00
006	72.4	-59.9	7/9/2008	13:23	8.27E+01	9.69E+01	1.71E+01	1.41E-01	8.70E-01	8.70E-01	3.09E+00	3.09E+00	3.09E+00	3.09E+00	3.09E+00	3.09E+00	3.09E+00	
007	72.4	-59.9	11/2/2008	14:38	1.97E+02	1.62E+02	2.09E+01	6.54E-01	7.82E-01	7.82E-01	3.68E+00	3.68E+00	3.68E+00	3.68E+00	3.68E+00	5.64E+00	5.64E+00	
008	72.4	-59.9	2/9/2009	11:23	1.67E+02	1.53E+02	1.16E+02	7.19E-01	9.91E-01	9.91E-01	6.53E+00	6.53E+00	6.53E+00	6.53E+00	6.53E+00	3.69E+00	3.69E+00	
009	72.4	-59.9	3/5/2009	10:32	1.57E+02	1.67E+02	6.23E+02	6.06E-01	7.12E-01	7.12E-01	2.29E+00	2.29E+00	2.29E+00	2.29E+00	2.29E+00	2.29E+00	2.29E+00	
010	72.4	-59.9	3/5/2009	14:56	1.37E+02	1.78E+02	1.78E+02	6.06E-01	7.12E-01	7.12E-01	2.29E+00	2.29E+00	2.29E+00	2.29E+00	2.29E+00	2.29E+00	2.29E+00	
011	72.4	-59.9	10/29/2009	11:38	1.71E+02	1.48E+02	4.07E+02	3.98E-01	4.31E-01	4.31E-01	3.15E+00	3.15E+00	3.15E+00	3.15E+00	3.15E+00	3.15E+00	3.15E+00	
012	72.4	-59.9	10/29/2009	11:38	1.71E+02	1.48E+02	4.07E+02	3.98E-01	4.31E-01	4.31E-01	3.15E+00	3.15E+00	3.15E+00	3.15E+00	3.15E+00	3.15E+00	3.15E+00	
013	72.4	-59.9	2/25/2010	11:31	3.07E+02	1.53E+02	1.47E+02	5.09E-01	7.02E-01	7.02E-01	6.53E+00	6.53E+00	6.53E+00	6.53E+00	6.53E+00	6.53E+00	6.53E+00	
014	72.4	-59.9	3/10/2010	12:31	3.07E+02	1.53E+02	1.47E+02	5.09E-01	7.02E-01	7.02E-01	6.53E+00	6.53E+00	6.53E+00	6.53E+00	6.53E+00	6.53E+00	6.53E+00	
001	134.9	-122.4	4/5/2007	12:03	2.54E+01	1.53E+02	1.81E+02	7.51E-01	1.05E+00	1.05E+00	3.02E+00	3.02E+00	3.02E+00	3.02E+00	3.02E+00	3.02E+00	3.02E+00	
002	134.9	-122.4	7/27/2007	16:00	3.92E+02	2.03E+02	1.13E+02	3.09E-01	4.92E-01	4.92E-01	2.78E+00	2.78E+00	2.78E+00	2.78E+00	2.78E+00	3.04E+00	3.04E+00	
003	134.9	-122.4	10/9/2007	14:20	3.30E+02	1.83E+02	2.59E+02	4.46E-01	6.12E-01	6.12E-01	4.13E+00	4.13E+00	4.13E+00	4.13E+00	4.13E+00	3.94E+00	3.94E+00	
004	134.9	-122.4	1/14/2008	14:19	3.79E+02	1.89E+02	1.74E+02	6.17E-01	8.22E-01	8.22E-01	4.31E+00	4.31E+00	4.31E+00	4.31E+00	4.31E+00	3.94E+00	3.94E+00	
005	134.9	-122.4	4/24/2008	12:31	3.83E+02	1.33E+02	1.93E+02	3.17E-01	6.93E-01	6.93E-01	1.02E+00	1.02E+00	1.02E+00	1.02E+00	1.02E+00	3.93E+00	3.93E+00	
006	134.9	-122.4	7/9/2008	13:53	4.91E+02	1.42E+02	1.91E+02	3.44E-01	6.18E-01	6.18E-01	1.79E+00	1.79E+00	1.79E+00	1.79E+00	1.79E+00	2.67E+00	2.67E+00	
007	134.9	-122.4	11/6/2008	10:49	4.28E+02	2.01E+02	1.99E+02	1.71E-01	4.18E-01	4.18E-01	1.48E+00	1.48E+00	1.48E+00	1.48E+00	1.48E+00	3.61E+00	3.61E+00	
008	134.9	-122.4	2/9/2009	10:34	3.83E+02	1.67E+02	1.69E+02	5.96E-01	6.99E-01	6.99E-01	1.42E+00	1.42E+00	1.42E+00	1.42E+00	1.42E+00	3.35E+00	3.35E+00	
009	134.9	-122.4	3/5/2009	10:54	3.17E+02	1.85E+02	1.77E+02	1.14E-01	6.15E-01	6.15E-01	8.76E+00	8.76E+00	8.76E+00	8.76E+00	8.76E+00	7.61E+00	7.61E+00	
010	134.9	-122.4	8/11/2009	10:52	3.46E+02	1.65E+02	1.69E+02	6.88E-01	6.65E-01	6.65E-01	1.76E+00	1.76E+00	1.76E+00	1.76E+00	1.76E+00	3.91E+00	3.91E+00	
011	134.9	-122.4	10/30/2009	10:53	3.13E+02	1.68E+02	1.21E+01	5.93E-01	7.31E-01	7.31E-01	1.73E+00	1.73E+00	1.73E+00	1.73E+00	1.73E+00	6.63E+00	6.63E+00	
012	134.9	-122.4	2/25/2010	11:43	3.13E+02	1.68E+02	1.21E+01	5.93E-01	7.31E-01	7.31E-01	1.73E+00	1.73E+00	1.73E+00	1.73E+00	1.73E+00	6.63E+00	6.63E+00	
013	134.9	-122.4	3/19/2010	12:31	4.18E+02	1.88E+02	5.46E+02	5.03E-01	8.53E-01	8.53E-01	1.53E+00	1.53E+00	1.53E+00	1.53E+00	1.53E+00	9.26E+00	9.26E+00	
014	134.9	-122.4	3/8/2009	12:33	4.18E+02	1.58E+02	3.18E+02	3.12E-01	9.30E-01	9.30E-01	3.06E+00	3.06E+00	3.06E+00	3.06E+00	3.06E+00	8.62E+00	8.62E+00	
015	134.9	-122.4	3/8/2009	14:56	4.18E+02	1.58E+02	3.18E+02	3.12E-01	9.30E-01	9.30E-01	3.06E+00	3.06E+00	3.06E+00	3.06E+00	3.06E+00	8.62E+00	8.62E+00	
002	154.4	-141.9	10/29/2007	14:33	5.40E+02	1.88E+02	1.92E+02	1.03E-01	4.92E-01	4.92E-01	3.62E+00	3.62E+00	3.62E+00	3.62E+00	3.62E+00	3.26E+00	3.26E+00	
003	154.4	-141.9	1/14/2008	12:33	5.40E+02	1.88E+02	1.92E+02	1.03E-01	4.92E-01	4.92E-01	3.62E+00	3.62E+00	3.62E+00	3.62E+00	3.62E+00	3.26E+00	3.26E+00	
004	154.4	-141.9	4/24/2008	13:35	5.16E+02	1.48E+02	2.14E+02	3.63E-01	7.74E-01	7.74E-01	1.34E+00	1.34E+00	1.34E+00	1.34E+00	1.34E+00	3.79E+00	3.79E+00	
005	154.4	-141.9	7/9/2008	13:35	5.16E+02	1.48E+02	2.14E+02	3.63E-01	7.74E-01	7.74E-01	1.34E+00	1.34E+00	1.34E+00	1.34E+00	1.34E+00	3.79E+00	3.79E+00	
006	154.4	-141.9	11/6/2008	13:35	5.16E+02	1.48E+02	2.14E+02	3.63E-01	7.74E-01	7.74E-01	1.34E+00	1.34E+00	1.34E+00	1.34E+00	1.34E+00	3.79E+00	3.79E+00	
007	154.4	-141.9	2/9/2009	12:23	4.11E+02	1.63E+02	4.23E+01	6.57E-01	7.19E-01	7.19E-01	2.47E+00	2.47E+00	2.47E+00	2.47E+00	2.47E+00	6.61E+00	6.61E+00	
008	154.4	-141.9	2/9/2009	12:23	4.11E+02	1.63E+02	4.23E+01	6.57E-01	7.19E-01	7.19E-01	2.47E+00	2.47E+00	2.47E+00	2.47E+00	2.47E+00	6.61E+00	6.61E+00	
009	154.4	-141.9	3/5/2009	11:13	4.39E+02	2.01E+02	7.26E+02	5.70E-01	6.98E-01	6.98E-01	3.89E+00	3.89E+00	3.89E+00	3.89E+00	3.89E+00	4.13E+00	4.13E+00	
010	154.4	-141.9	8/11/2009	11:14	3.13E+02	1.71E+02	3.52E+02	7.18E-01	9.99E-01	9.99E-01	6.88E+00	6.88E+00	6.88E+00	6.88E+00	6.88E+00	5.42E+00	5.42E+00	
011	154.4	-141.9	10/30/2009	10:56	4.09E+02	1.59E+02	4.85E+01	8.40E-01	9.50E-01	9.50E-01	3.48E+00	3.48E+00	3.48E+00	3.48E+00	3.48E+00	7.01E+00	7.01E+00	
012	154.4	-141.9	2/25/2010	11:45	3.78E+02	1.71E+02	1.97E+02	6.63E-01	7.90E-01	7.90E-01	1.32E+00	1.32E+00	1.32E+00	1.32E+00	1.32E+00	4.86E+00	4.86E+00	
013	154.4	-141.9	3/19/2010	12:32	4.38E+02	1.85E+02	3.52E+01	6.23E-01	7.91E-01	7.91E-01	1.33E+00	1.33E+00	1.33E+00	1.33E+00	1.33E+00	8.61E+00	8.61E+00	
001	175.9	-163.4	3/8/2007	12:32	5.30E+02	2.01E+02	6.88E+02	5.66E-01	7.92E-01	7.92E-01	3.92E+00	3.92E+00	3.92E+00	3.92E+00	3.92E+00	5.15E+00	5.15E+00	
002	175.9	-163.4	7/27/2007	17:35	8.40E+02	2.49E+02	4.60E+02	5.84E-01	7.57E-01	7.57E-01	2.00E+00	2.00E+00	2.00E+00	2.00E+00	2.00E+00	3.03E+00	3.03E+00	
003	175.9	-163.4	10/9/2007	14:57	7.02E+02	2.01E+02	5.93E+02	5.11E-01	6.94E-01	6.94E-01	2.63E+00	2.63E+00	2.63E+00	2.63E+00				

TABLE 5
HISTORIC GROUNDWATER ANALYTICAL RESULTS
INDIAN POINT ENERGY CENTER
BUCHANAN, TN

Well ID	SAMPLE CENTER, CENTER, elevation in feet	SAMPLE ZONE CENTER, CENTER, depth ft below top of casing	SAMPLE COLLECTION			ANALYSIS RESULTS										Well ID			
			Date	Time	TRITIUM (pCi/L)		Sr-90 (pCi/L)		Cs-137 (pCi/L)		Co-60 (pCi/L)		Mn-54 (pCi/L)		Std. Dev.		MDC	Result	
					Result	Std. Dev.	Result	Std. Dev.	Result	Std. Dev.	Result	Std. Dev.	Result	Std. Dev.					Result
U1-11	011	5.7	2.8	11/10/2005	12:00	4.26E+02	4.61E+02	NA	NA	3.11E+00	9.23E+00	2.07E+00	6.09E+00	6.09E+00	NA	NA	NA	75-21	
U1-11	012	5.7	2.8	11/10/2005	12:00	4.26E+02	4.61E+02	NA	NA	3.11E+00	9.23E+00	2.07E+00	6.09E+00	6.09E+00	NA	NA	NA	75-21	
U1-11	013	5.7	2.8	11/10/2005	12:00	4.26E+02	4.61E+02	NA	NA	3.11E+00	9.23E+00	2.07E+00	6.09E+00	6.09E+00	NA	NA	NA	75-21	
U1-11	001	5.7	2.8	12/15/2005	13:15	3.40E+02	4.70E+02	NA	NA	2.32E+00	7.02E+00	2.80E+00	8.67E+00	8.67E+00	NA	NA	NA	75-21	
U1-11	002	5.7	2.8	12/15/2005	10:40	3.29E+02	4.71E+02	NA	NA	2.32E+00	7.02E+00	2.80E+00	8.67E+00	8.67E+00	NA	NA	NA	75-21	
U1-11	003	5.7	2.8	12/15/2005	9:30	3.87E+02	4.47E+02	NA	NA	4.02E+00	1.11E+01	8.71E+00	9.17E+00	9.17E+00	NA	NA	NA	75-21	
U1-11	004	5.7	2.8	12/15/2005	13:15	8.33E+02	6.35E+02	NA	NA	3.10E+00	9.23E+00	2.88E+00	8.49E+00	8.49E+00	NA	NA	NA	75-21	
U1-11	005	5.7	2.8	12/15/2005	11:50	1.20E+03	1.85E+02	6.55E+01	8.48E+01	1.06E+00	3.40E+00	6.18E+00	6.18E+00	6.18E+00	NA	NA	NA	75-21	
U1-11	006	5.7	2.8	5/26/2006	13:30	7.33E+02	2.33E+02	1.89E+02	1.02E+00	1.21E+00	8.34E+00	9.43E+00	8.08E+00	1.13E+01	NA	NA	NA	75-21	
U1-11	014	5.7	2.8	7/12/2006	12:50	6.88E+02	2.66E+02	1.93E+02	1.36E+00	1.15E+00	1.18E+01	1.18E+01	1.18E+01	1.18E+01	NA	NA	NA	75-21	
U1-11	015	5.7	2.8	8/12/2006	11:30	7.68E+02	2.25E+02	1.78E+02	1.44E+00	1.15E+00	6.32E+00	6.32E+00	6.32E+00	6.32E+00	NA	NA	NA	75-21	
U1-11	016	5.7	2.8	8/12/2007	12:54	3.08E+02	4.28E+02	4.29E+02	8.75E+01	8.31E+01	3.27E+00	2.22E+00	7.17E+01	2.00E+00	2.00E+00	2.00E+00	2.00E+00	1.60E+01	
U1-11	017	5.7	2.8	8/12/2007	10:13	3.93E+02	4.01E+02	4.01E+02	5.02E+01	5.02E+01	3.78E+00	3.78E+00	3.78E+00	3.78E+00	3.78E+00	3.78E+00	3.78E+00	3.78E+00	
U1-11	018	5.7	2.8	8/12/2008	14:44	3.02E+02	3.17E+02	3.17E+02	6.99E+01	6.99E+01	1.08E+00	3.48E+00	3.48E+00	3.48E+00	3.48E+00	3.48E+00	3.48E+00	3.48E+00	
U1-11	019	5.7	2.8	12/23/2008	15:11	6.09E+02	3.15E+02	2.97E+02	6.43E+01	6.43E+01	1.15E+00	3.75E+00	3.75E+00	3.75E+00	3.75E+00	3.75E+00	3.75E+00	3.75E+00	
U1-11	020	5.7	2.8	4/25/2008	15:24	7.09E+02	3.22E+02	3.22E+02	7.41E+01	7.41E+01	2.54E+00	1.81E+00	1.81E+00	1.81E+00	1.81E+00	1.81E+00	1.81E+00	1.81E+00	
U1-11	021	5.7	2.8	4/25/2008	15:24	7.09E+02	3.22E+02	3.22E+02	7.41E+01	7.41E+01	2.54E+00	1.81E+00	1.81E+00	1.81E+00	1.81E+00	1.81E+00	1.81E+00	1.81E+00	
U1-11	022	5.7	2.8	10/20/2008	10:49	3.59E+02	3.59E+02	3.59E+02	5.09E+01	5.09E+01	2.41E+00	2.41E+00	2.41E+00	2.41E+00	2.41E+00	2.41E+00	2.41E+00	2.41E+00	
U1-11	023	5.7	2.8	1/22/2009	12:00	6.73E+02	2.48E+02	2.04E+02	1.04E+01	1.04E+01	4.77E+01	4.77E+01	4.77E+01	4.77E+01	4.77E+01	4.77E+01	4.77E+01	4.77E+01	
U1-11	024	5.7	2.8	4/19/2009	13:22	3.83E+02	1.63E+02	1.40E+02	3.23E+01	3.23E+01	1.68E+01	6.03E+00	4.02E+00	1.24E+00	3.92E+00	4.14E+00	NA	NA	75-21
U1-11	025	5.7	2.8	7/14/2009	11:08	3.99E+02	2.36E+02	2.32E+02	7.47E+01	7.47E+01	2.31E+00	5.24E+00	5.63E+00	9.47E+01	3.72E+00	4.45E+00	NA	NA	
U1-11	026	5.7	2.8	11/13/2009	10:35	3.79E+02	1.83E+02	1.03E+02	3.87E+01	3.87E+01	6.83E+01	5.33E+00	3.02E+00	1.33E+00	6.33E+00	7.37E+00	NA	NA	
U1-11	027	5.7	2.8	2/10/2010	12:02	4.70E+02	1.72E+02	1.78E+02	2.19E+01	2.19E+01	1.28E+01	6.24E+00	3.80E+00	2.79E+00	5.74E+00	4.78E+00	NA	NA	
U1-11	028	5.7	2.8	5/5/2010	12:54	3.00E+02	1.79E+02	1.84E+02	4.95E+01	4.95E+01	5.97E+01	8.58E+00	8.00E+00	1.04E+00	6.62E+00	7.16E+00	NA	NA	
U1-11	029	5.7	2.8	10/7/2010	12:30	7.03E+02	3.63E+02	4.13E+02	NA	NA	3.67E+00	1.10E+01	1.00E+01	3.00E+00	9.00E+00	NA	NA	75-21	
U1-11	030	5.7	2.8	10/21/2005	12:00	1.47E+03	4.56E+02	4.27E+02	NA	NA	3.34E+00	1.03E+01	7.23E+00	3.00E+00	9.00E+00	NA	NA	75-21	
U1-11	031	5.7	2.8	11/29/2005	12:00	1.28E+03	4.56E+02	4.72E+02	NA	NA	3.48E+00	1.03E+01	7.23E+00	3.00E+00	9.00E+00	NA	NA	75-21	
U1-11	032	5.7	2.8	11/29/2005	12:00	1.19E+03	4.59E+02	4.61E+02	NA	NA	3.48E+00	1.03E+01	7.23E+00	3.00E+00	9.00E+00	NA	NA	75-21	
U1-11	033	5.7	2.8	11/29/2005	12:00	1.69E+03	4.59E+02	4.61E+02	NA	NA	3.48E+00	1.03E+01	7.23E+00	3.00E+00	9.00E+00	NA	NA	75-21	
U1-11	034	5.7	2.8	11/29/2005	12:00	1.19E+03	4.59E+02	4.61E+02	NA	NA	3.48E+00	1.03E+01	7.23E+00	3.00E+00	9.00E+00	NA	NA	75-21	
U1-11	035	5.7	2.8	11/29/2005	12:00	1.19E+03	4.59E+02	4.61E+02	NA	NA	3.48E+00	1.03E+01	7.23E+00	3.00E+00	9.00E+00	NA	NA	75-21	
U1-11	036	5.7	2.8	11/29/2005	12:00	1.19E+03	4.59E+02	4.61E+02	NA	NA	3.48E+00	1.03E+01	7.23E+00	3.00E+00	9.00E+00	NA	NA	75-21	
U1-11	037	5.7	2.8	11/29/2005	12:00	1.19E+03	4.59E+02	4.61E+02	NA	NA	3.48E+00	1.03E+01	7.23E+00	3.00E+00	9.00E+00	NA	NA	75-21	
U1-11	038	5.7	2.8	11/29/2005	12:00	1.19E+03	4.59E+02	4.61E+02	NA	NA	3.48E+00	1.03E+01	7.23E+00	3.00E+00	9.00E+00	NA	NA	75-21	
U1-11	039	5.7	2.8	11/29/2005	12:00	1.19E+03	4.59E+02	4.61E+02	NA	NA	3.48E+00	1.03E+01	7.23E+00	3.00E+00	9.00E+00	NA	NA	75-21	
U1-11	040	5.7	2.8	11/29/2005	12:00	1.19E+03	4.59E+02	4.61E+02	NA	NA	3.48E+00	1.03E+01	7.23E+00	3.00E+00	9.00E+00	NA	NA	75-21	
U1-11	041	5.7	2.8	11/29/2005	12:00	1.19E+03	4.59E+02	4.61E+02	NA	NA	3.48E+00	1.03E+01	7.23E+00	3.00E+00	9.00E+00	NA	NA	75-21	
U1-11	042	5.7	2.8	11/29/2005	12:00	1.19E+03	4.59E+02	4.61E+02	NA	NA	3.48E+00	1.03E+01	7.23E+00	3.00E+00	9.00E+00	NA	NA	75-21	
U1-11	043	5.7	2.8	11/29/2005	12:00	1.19E+03	4.59E+02	4.61E+02	NA	NA	3.48E+00	1.03E+01	7.23E+00	3.00E+00	9.00E+00	NA	NA	75-21	
U1-11	044	5.7	2.8	11/29/2005	12:00	1.19E+03	4.59E+02	4.61E+02	NA	NA	3.48E+00	1.03E+01	7.23E+00	3.00E+00	9.00E+00	NA	NA	75-21	
U1-11	045	5.7	2.8	11/29/2005	12:00	1.19E+03	4.59E+02	4.61E+02	NA	NA	3.48E+00	1.03E+01	7.23E+00	3.00E+00	9.00E+00	NA	NA	75-21	
U1-11	046	5.7	2.8	11/29/2005	12:00	1.19E+03	4.59E+02	4.61E+02	NA	NA	3.48E+00	1.03E+01	7.23E+00	3.00E+00	9.00E+00	NA	NA	75-21	
U1-11	047	5.7	2.8	11/29/2005	12:00	1.19E+03	4.59E+02	4.61E+02	NA	NA	3.48E+00	1.03E+01	7.23E+00	3.00E+00	9.00E+00	NA	NA	75-21	
U1-11	048	5.7	2.8	11/29/2005	12:00	1.19E+03	4.59E+02	4.61E+02	NA	NA	3.48E+00	1.03E+01	7.23E+00	3.00E+00	9.00E+00	NA	NA	75-21	
U1-11	049	5.7	2.8	11/29/2005	12:00	1.19E+03	4.59E+02	4.61E+02	NA	NA	3.48E+00	1.03E+01	7.23E+00	3.00E+00	9.00E+00	NA	NA	75-21	
U1-11	050	5.7	2.8	11/29/2005	12:00	1.19E+03	4.59E+02	4.61E+02	NA	NA	3.48E+00	1.03E+01	7.23E+00	3.00E+00	9.00E+00	NA	NA	75-21	
U1-11	051	5.7	2.8	11/29/2005	12:00	1.19E+03	4.59E+02	4.61E+02	NA	NA	3.48E+00	1.03E+01	7.23E+00	3.00E+00	9.00E+00	NA	NA	75-21	
U1-11	052	5.7	2.8	11/29/2005	12:00	1.19E+03	4.59E+02	4.61E+02	NA	NA	3.48E+00	1.03E+01	7.23E+00	3.00E+00	9.00E+00	NA	NA	75-21	
U1-11	053	5.7	2.8	11/29/2005	12:00	1.19E+03	4.59E+02	4.61E+02	NA	NA	3.48E+00	1.03E+01	7.23E+00	3.00E+00	9.00E+00	NA	NA	75-21	
U1-11	054	5.7	2.8	11/29/2005	12:00	1.19E+03	4.59E+02	4.61E+02	NA	NA	3.48E+00	1.03E+01	7.23E+00	3.00E+00	9.00E+00	NA	NA	75-21	
U1-11	055	5.7	2.8	11/29/2005	12:00	1.19E+03	4.59E+02	4.61E+02	NA	NA	3.48E+00	1.03E+01	7.23E+00	3.00E+00	9.00E+00	NA	NA	75-21	
U1-11	056	5.7	2.8	11/29/2005	12:00	1.19E+03	4.59E+02	4.61E+02	NA	NA	3.48E+00	1.03E+01	7.23E+00	3.00E+00	9.00E+00	NA			

TABLE 6
HISTORIC GROUNDWATER ANALYTICAL RESULTS
INDIAN POINT ENERGY CENTER
BUCHANAN, NY

Well ID ¹	SAMPLE ZONE CENTER, depth ft below top of casing ²	SAMPLE ZONE CENTER, elevation ft w.r.t. elevation ft w.r.t. MDC	SAMPLE COLLECTION			ANALYSIS RESULTS												Well ID ¹	
			Date	Time	TRITIUM (pCTL)			SR-90 (pCCL)			Co-137 (pCCL)			Co-60 (pCCL)			Sta. Dev.		MDC
					Result	Std. Dev.	MDC	Result	Std. Dev.	MDC	Result	Std. Dev.	MDC	Result	Std. Dev.	MDC			
B-1	007		2/21/2010	1410	1.49E-03	2.13E-02	1.69E-02	4.61E-02	3.00E-01	3.29E-01	4.53E-00	5.43E-00	6.44E-00	6.69E-01	7.14E+00	5.88E+00	NA	NA	B-1
	008		4/23/2010	1644	8.11E-02	1.91E-02	1.83E-02	2.22E-01	5.20E-01	6.03E-01	9.79E-00	7.91E-00	6.88E-00	5.99E-01	6.24E+00	7.21E+00	NA	NA	
	001		7/5/2007	930	4.03E-02	1.67E-02	1.69E-02	1.01E-01	4.97E-01	5.77E-01	1.29E+00	3.66E-00	4.04E+00	1.09E+00	3.51E+00	4.15E+00	NA	NA	
B-6	002		8/11/2007	820	5.46E-01	1.68E-02	1.92E-02	-3.06E-01	6.20E-01	8.32E-01	5.63E-01	2.97E-00	3.42E+00	-2.88E-00	3.31E+00	2.35E+00	NA	NA	B-6
	003		10/27/2007	1130	1.07E+02	1.70E-02	1.99E-02	-7.54E-02	4.14E-01	8.83E-01	2.39E+00	4.41E+00	3.04E+00	1.04E+00	2.46E+00	3.05E+00	NA	NA	
	004		1/16/2008	1630	4.72E+02	2.04E-02	1.79E-02	1.05E-01	7.05E-01	8.83E-01	3.96E+00	4.41E+00	3.32E+00	1.29E+00	3.15E+00	3.66E+00	NA	NA	
005			4/23/2008	1415	5.23E-01	8.43E-01	1.43E-02	-1.20E-01	2.59E-01	8.14E-01	-2.89E-01	1.50E-00	3.24E+00	-7.50E-01	3.43E+00	4.21E+00	NA	NA	005
			6/5/2009	940	1.08E-02	1.46E-02	1.63E-02	1.71E-02	7.08E-01	8.14E-01	1.50E-01	1.43E+00	4.84E+00	1.25E-01	5.79E+00	6.80E+00	NA	NA	
			2/19/2010	935	3.78E-02	1.63E-02	1.68E-02	1.14E-02	3.57E-01	4.99E-01	1.43E+00	4.13E+00	4.84E+00	2.21E-01	3.96E+00	4.54E+00	NA	NA	
007			5/18/2010	940	4.88E-01	1.62E-02	1.84E-02	-1.02E-01	4.47E-01	5.71E-01	5.39E-01	5.88E+00	6.34E+00	2.39E-01	5.50E+00	6.27E+00	NA	NA	007
			5/18/2010	940	4.88E-01	1.62E-02	1.84E-02	-1.02E-01	4.47E-01	5.71E-01	5.39E-01	5.88E+00	6.34E+00	2.39E-01	5.50E+00	6.27E+00	NA	NA	

Notes

- For nested multilevel monitoring wells, value of well ID indicates depth (rounded to nearest foot) from reference point on casing to bottom of well screen. For Waterloo multi-level systems, value in feet after depth (rounded to nearest foot) from reference point on casing to top of sampling port. Well IDs without suffix are open bedrock wellscreens.
- Sampling depths within sampling intervals (location of pump intake) have been adjusted to a location of 10 feet in diameter size to the extent possible.
- NA indicates that the concentration was not analyzed.
- For the Waterloo multi-level monitoring wells, MDC values have been based on the highest MDC value for the monitoring well.
- For the Waterloo multi-level monitoring wells, MDC values have been based on the highest MDC value for the monitoring well.
- For the Waterloo multi-level monitoring wells, MDC values have been based on the highest MDC value for the monitoring well.
- For the Waterloo multi-level monitoring wells, MDC values have been based on the highest MDC value for the monitoring well.



FIGURES

- Figure 1 Site Location Plan**
- Figure 2 Site Plan**
- Figure 3 Lower Hudson Valley Geologic Map**
- Figure 4 Current and Potential Future SSC Source Locations**
- Figure 5A Long-Term Transducer Monitoring Evaluation Map**
- Figure 6 2nd Quarter 2010 Average Tritium Activity Map**
- Figure 6A Temporal Trends in Unit 2 Rolling Average Tritium Activity Maps**
- Figure 7 2nd Quarter 2010 Average Strontium-90 Activity Map**
- Figure 7A Sr-90 Baseline Analysis – Unit 1 Defueling Evaluation**
- Figure 8 2nd Quarter 2010 Average Cesium, Cobalt, and Nickel Activity Map**



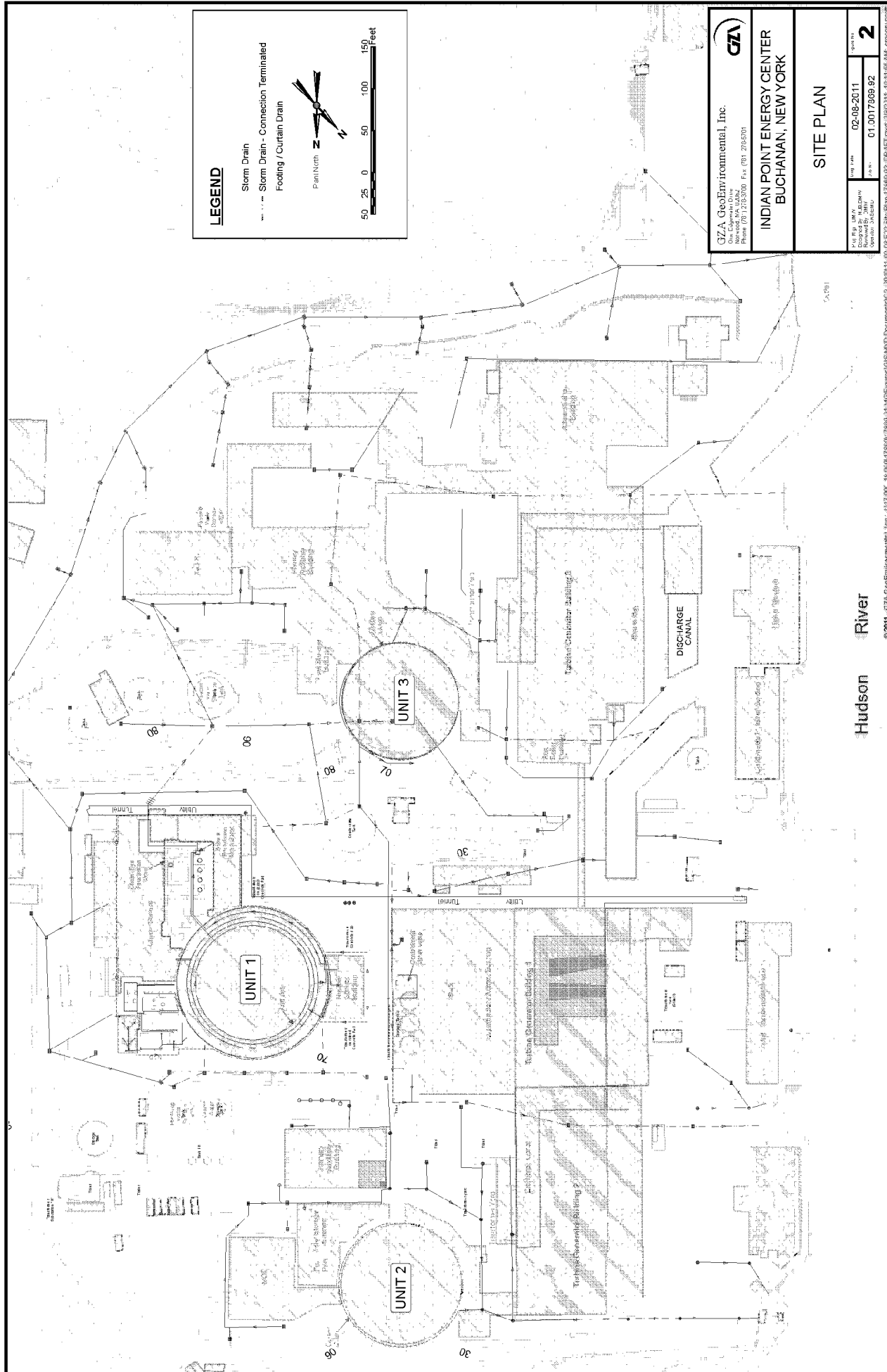
GZA GeoEnvironmental, Inc.
 1100 N. 17th St.
 Suite 200
 Lincoln, NE 68502
 Phone (402) 441-2000 Fax (402) 441-2001

INDIAN POINT ENERGY CENTER
 BUCHANAN, NEW YORK

SITE LOCATION PLAN

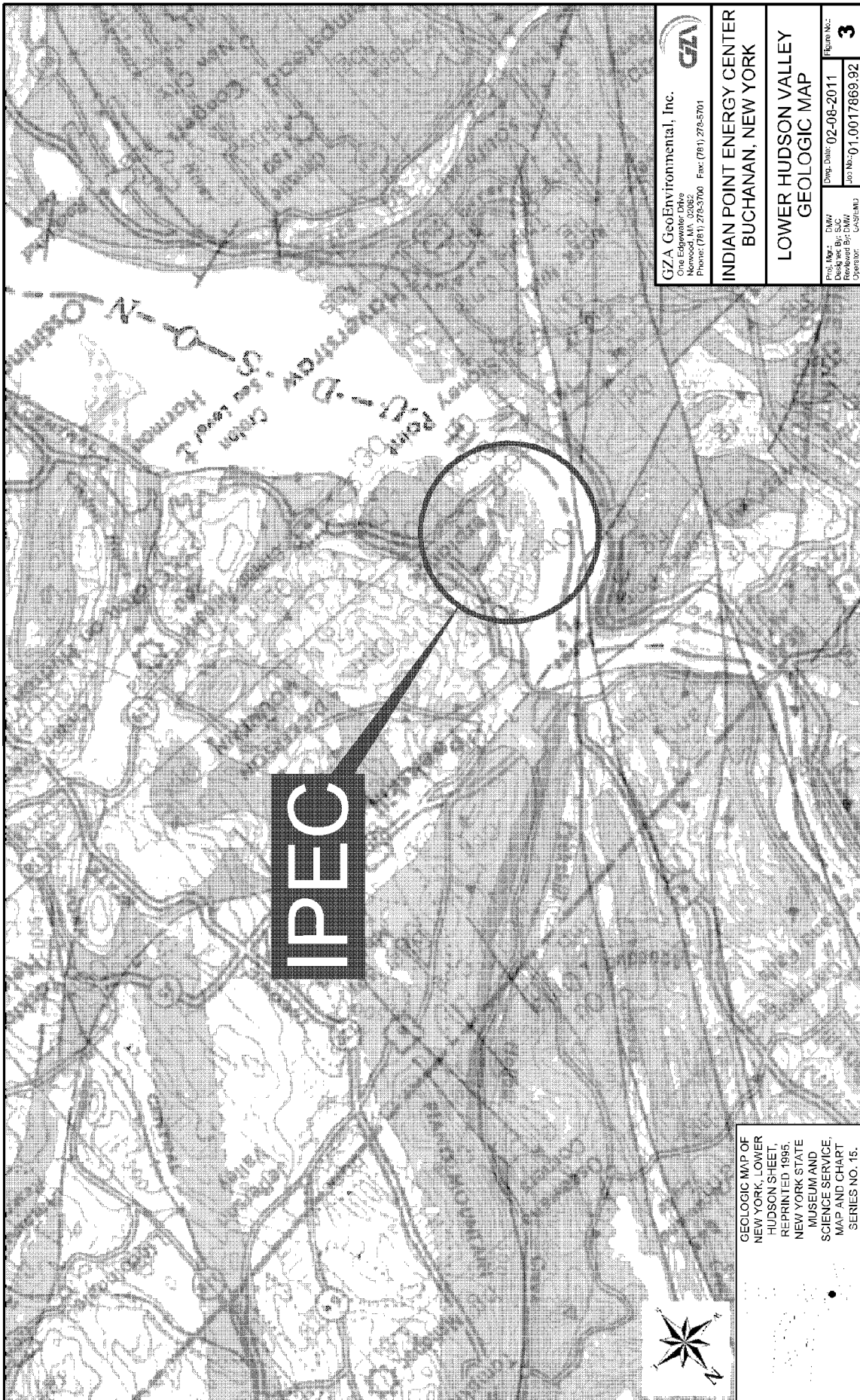
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Drawn By	JOHN	Scale	01 0017865.92

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Hudson River

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IPEC

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 One Edgewater Drive
 Honesdale, NY 12433
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**INDIAN POINT ENERGY CENTER
 BUCHANAN, NEW YORK**

**LOWER HUDSON VALLEY
 GEOLOGIC MAP**

Proj. No.: DMW
 Drawn by: SJC
 Operator: CAS/MDJ
 Date: 02-08-2011
 Job No.: 01.0017869.92
 Figure No.: **3**



GEOLOGIC MAP OF
 NEW YORK, LOWER
 HUDSON SHEET,
 REPRINTED, 1985
 NEW YORK STATE
 MUSEUM AND
 SCIENCE SERVICE,
 MAP AND CHART
 SERIES NO. 45.

GZA - \17,000-16,999\17869-92\17869-92-08-F03-Lower Hudson Valley Geologic Map 17869-92 - DRAFT.dwg [10-3] February 08, 2011 - 10:08am gregory.sct

2nd QUARTER 2010 LONGTERM TRANSDUCER MONITORING EVALUATION MAP

Monitoring Point	Monitoring Point Description	Monitoring Point Type	Monitoring Point Status	Monitoring Point Location
MP1	Unit 1 Fuel Tank	Leakage	Active	Unit 1 Fuel Tank
MP2	Unit 2 Fuel Tank	Leakage	Active	Unit 2 Fuel Tank
MP3	Unit 3 Fuel Tank	Leakage	Active	Unit 3 Fuel Tank
MP4	Unit 1 Fuel Tank	Leakage	Active	Unit 1 Fuel Tank
MP5	Unit 2 Fuel Tank	Leakage	Active	Unit 2 Fuel Tank
MP6	Unit 3 Fuel Tank	Leakage	Active	Unit 3 Fuel Tank
MP7	Unit 1 Fuel Tank	Leakage	Active	Unit 1 Fuel Tank
MP8	Unit 2 Fuel Tank	Leakage	Active	Unit 2 Fuel Tank
MP9	Unit 3 Fuel Tank	Leakage	Active	Unit 3 Fuel Tank
MP10	Unit 1 Fuel Tank	Leakage	Active	Unit 1 Fuel Tank
MP11	Unit 2 Fuel Tank	Leakage	Active	Unit 2 Fuel Tank
MP12	Unit 3 Fuel Tank	Leakage	Active	Unit 3 Fuel Tank
MP13	Unit 1 Fuel Tank	Leakage	Active	Unit 1 Fuel Tank
MP14	Unit 2 Fuel Tank	Leakage	Active	Unit 2 Fuel Tank
MP15	Unit 3 Fuel Tank	Leakage	Active	Unit 3 Fuel Tank
MP16	Unit 1 Fuel Tank	Leakage	Active	Unit 1 Fuel Tank
MP17	Unit 2 Fuel Tank	Leakage	Active	Unit 2 Fuel Tank
MP18	Unit 3 Fuel Tank	Leakage	Active	Unit 3 Fuel Tank
MP19	Unit 1 Fuel Tank	Leakage	Active	Unit 1 Fuel Tank
MP20	Unit 2 Fuel Tank	Leakage	Active	Unit 2 Fuel Tank
MP21	Unit 3 Fuel Tank	Leakage	Active	Unit 3 Fuel Tank
MP22	Unit 1 Fuel Tank	Leakage	Active	Unit 1 Fuel Tank
MP23	Unit 2 Fuel Tank	Leakage	Active	Unit 2 Fuel Tank
MP24	Unit 3 Fuel Tank	Leakage	Active	Unit 3 Fuel Tank
MP25	Unit 1 Fuel Tank	Leakage	Active	Unit 1 Fuel Tank
MP26	Unit 2 Fuel Tank	Leakage	Active	Unit 2 Fuel Tank
MP27	Unit 3 Fuel Tank	Leakage	Active	Unit 3 Fuel Tank
MP28	Unit 1 Fuel Tank	Leakage	Active	Unit 1 Fuel Tank
MP29	Unit 2 Fuel Tank	Leakage	Active	Unit 2 Fuel Tank
MP30	Unit 3 Fuel Tank	Leakage	Active	Unit 3 Fuel Tank

LEGEND

Monitoring Installations

- Boring / Monitoring Installation Description
- Leakage / Radiometric Monitoring Installation
- Chemistry / Radiometric Monitoring Installation

Potential Future Source Locations

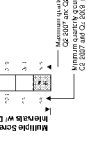
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- Unit 1 Fuel Tank / Unit 2 Fuel Tank / Unit 3 Fuel Tank

Probable Leakage Release SSGs

- Unit 1 Fuel Tank / Unit 2 Fuel Tank / Unit 3 Fuel Tank
- Unit 1 Fuel Tank / Unit 2 Fuel Tank / Unit 3 Fuel Tank

Activity Data

- Monitoring Activity 10/10
- Monitoring Activity 10/10



Potential Future Source Locations

Unit 1 Fuel Tank / Unit 2 Fuel Tank / Unit 3 Fuel Tank

Probable Leakage Release SSGs

Unit 1 Fuel Tank / Unit 2 Fuel Tank / Unit 3 Fuel Tank

Activity Data

Monitoring Activity 10/10

Activity Data

Monitoring Activity 10/10

Activity Data

Monitoring Activity 10/10

Activity Data

Monitoring Activity 10/10

Activity Data

Monitoring Activity 10/10

Activity Data

Monitoring Activity 10/10

Activity Data

Monitoring Activity 10/10

Activity Data

Monitoring Activity 10/10

Activity Data

Monitoring Activity 10/10

Activity Data

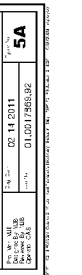
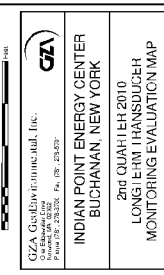
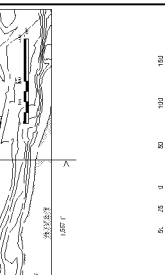
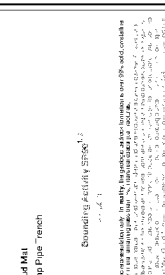
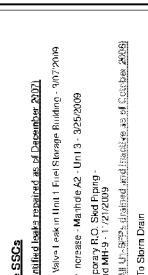
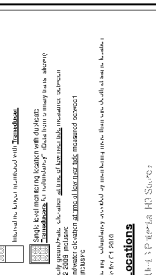
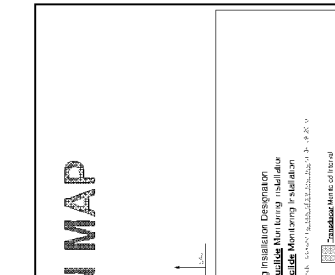
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Activity Data

Monitoring Activity 10/10

Activity Data

Monitoring Activity 10/10



INDIAN POINT ENERGY CENTER
BUCHANAN, NEW YORK

2nd QUARTER 2010
LONGTERM TRANSDUCER
MONITORING EVALUATION MAP

DATE: 05/14/2011
DRAWN BY: [Name]
CHECKED BY: [Name]

SCALE: 1" = 100'

PROJECT NO: [Number]

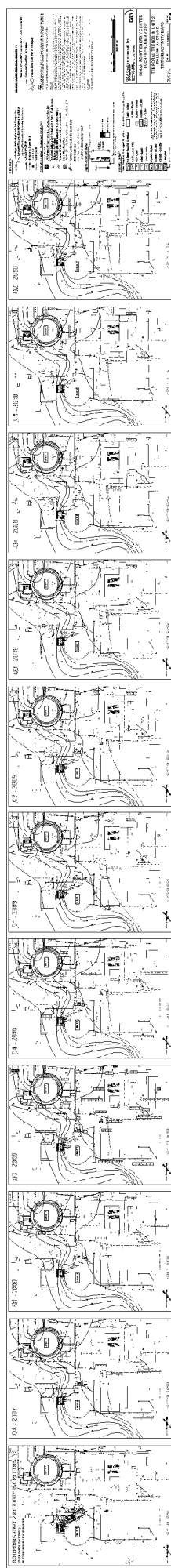
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CONTRACT NO: [Number]

DATE: 05/14/2011

SCALE: 1" = 100'

PROJECT NO: [Number]





APPENDIX A: LIMITATIONS

HYDROGEOLOGICAL LIMITATIONS

1. The conclusions and recommendations submitted in this report are based in part upon the radiological, chemical and physical data from water analyses. These data were obtained from specific sampling locations at specific times. The full nature and extent of variations in the data between these specific locations and times are not known. The conditions existing between these specific locations and times have only been inferred using interpolation and extrapolation based on judgment.
2. The subsurface profiles described in the text and presented in the report figures are intended to convey anticipated trends in subsurface conditions. The conditions shown are approximate and generalized and were developed, in part, based on judgment. For specific information at specific locations, refer to the individual subsurface investigation logs.
3. Water level readings (piezometric pressures) have been made in the specific borings, monitoring wells, and Waterloo installations at times and under conditions stated. These data have been reviewed and interpretations have been made in the text and on the figures of this report. However, it must be noted that temporal and spatial fluctuations in the level of the groundwater may occur due to variations in rainfall and other factors different from those prevailing at the time and location measurements were made.
4. Where quantitative laboratory testing has been conducted by an outside laboratory, GZA has relied upon the validity of the data provided, and has not conducted an independent laboratory evaluation of the reliability of these data.
5. Radiological and chemical analyses have been performed for specific parameters during the course of this study, as summarized in the text. Additional constituents not searched for may be present in soil and groundwater at the site.
6. Variations in the types and concentrations of contaminants and variations in their flow paths may occur due to seasonal water table fluctuations, past and current plant operational practices, the passage of time, and other factors. Should additional data (water analyses, water elevations, subsurface deposits, plant construction and operation, etc.) become available in the future, these data should be reviewed by GZA, and the conclusions and recommendations presented herein modified accordingly.
7. This monitoring report was developed by GZA GeoEnvironmental Inc for the exclusive of Entergy Nuclear Northeast (Entergy) at the Indian Point Energy Center. Any use of data or information provided in the report, by parties other than Entergy, is prohibited without the prior written permission of Entergy and GZA.



APPENDIX B: TRANSDUCER INSTALLATION LOGS

TRANSDUCER INSTALLATION LOG

GZA GEOENVIRONMENTAL OF NEW YORK 440 NINTH AVENUE, 18th FLOOR NEW YORK, NEW YORK 10001 SCIENTISTS AND ENGINEERS	Client	Entergy Indian Point Energy Center	WELL ID	U3-4D
			SHEET	1 of 1
			FILE NO.	01.0017869.91
			PROJECT LOCATION	Indian Point

MANUFACTURER	<u>In-Situ</u>	FINAL BORING DEPTH (FT)	<u>27.25</u>	DATUM	NGVD 29
MAKE	<u>MiniTroll</u>	GROUND ELEVATION (FT)	<u>14.849</u>	DATE	4/12/10
PSI CAPACITY	<u>30</u>	CASING ELEVATION (FT)	<u>14.519</u>		
SERIAL NUMBER	<u>14301</u>	CASING DIAMETER (INCH)	<u>4</u>		

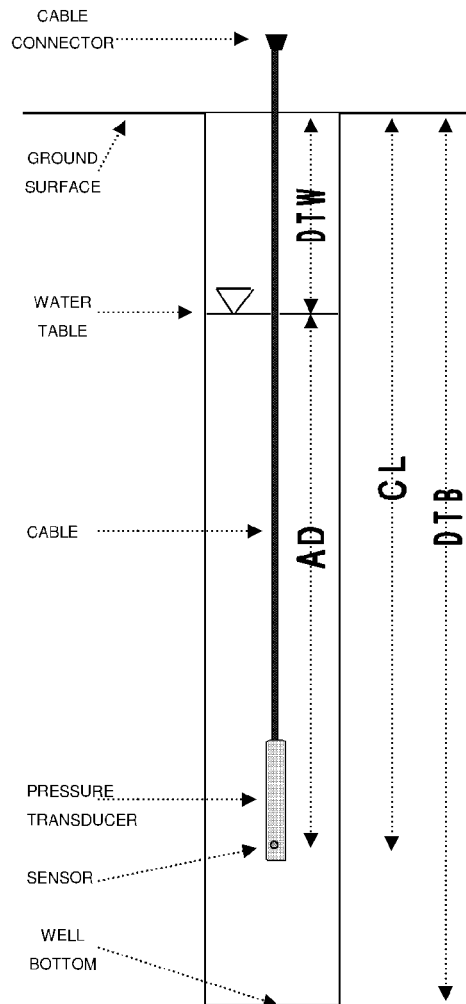
STATIC GROUNDWATER TABLE ELEVATION (FT) 3.97

GZA ENGINEER M. Britos

ELEVATION OF MEASURING POINT - DEPTH TO WATER = REFERENCE ELEVATION (WATER TABLE ELEVATION)

DEPTH TO WATER + ACTUAL DEPTH = CABLE LENGTH (if transducer is functioning properly)

DEPTH TO BOTTOM:	<u>27.25</u>		FT
GROUND ELEVATION:	<u>14.849</u>		FT M.S.L.
CASING ELEVATION:	<u>14.519</u>		FT M.S.L.
CASING ABOVE (+) OR BELOW (-) GROUND:	<u>below</u>		
DISTANCE FROM CASING TO GROUND (+ OR -):	<u>-0.330</u>		FT
MEASURED CABLE LENGTH:	<u>--</u>		FT
TIME OF MEASUREMENT:	<u>9:48</u>		HRS
MEASUREMENT TAKEN FROM:	<u>TOC</u>		
DEPTH TO WATER:	<u>10.55</u>		FT
ACTUAL DEPTH:	<u>+ 50.811</u>		FT
THEORETICAL CABLE LENGTH:	<u>= 61.361</u>		FT
HAVE CLOCKS BEEN SYNCHRONIZED?	<input checked="" type="checkbox"/>	check	
IS TRANSDUCER SET TO TAKE "SURFACE" READINGS?	<input checked="" type="checkbox"/>	check	
ELEVATION OF MEASURING POINT:	<u>14.519</u>		FT M.S.L.
DEPTH TO WATER:	<u>- 10.55</u>		FT
REFERENCE ELEVATION:	<u>= 3.969</u>		FT M.S.L.
TEST NAME:	<u>U3-4D</u>		
LOGGING INTERVAL:	<u>20</u>		MIN
TEST START TIME:	<u> </u>		HRS



LEGEND: DTW - DEPTH TO WATER
 DTB - DEPTH TO BOTTOM OF WELL
 AD - ACTUAL DEPTH OF TRANSDUCER UNDER WATER
 CL - CABLE LENGTH FROM SENSOR TO GROUND SURFACE/ TOP OF CASING

NOTES:
 Difference > 0.3 (-0.302)
 Reset.

TRANSDUCER INSTALLATION LOG

GZA GEOENVIRONMENTAL OF NEW YORK 440 NINTH AVENUE, 18th FLOOR NEW YORK, NEW YORK 10001 SCIENTISTS AND ENGINEERS	Client	Entergy Indian Point Energy Center	WELL ID	HR-1
			SHEET	1 of 1
			FILE NO.	01.0017869.91
			PROJECT LOCATION	Indian Point

MANUFACTURER	<u>In-Situ</u>	FINAL BORING DEPTH (FT)	<u>--</u>	DATUM	<u>NGVD 29</u>
MAKE	<u>MiniTroll</u>	GROUND ELEVATION (FT)	<u>14.99</u>	DATE	<u>4/13/10</u>
PSI CAPACITY	<u>30</u>	CASING ELEVATION (FT)	<u>18.50</u>		
SERIAL NUMBER	<u>14114</u>	CASING DIAMETER (INCH)	<u>2</u>		

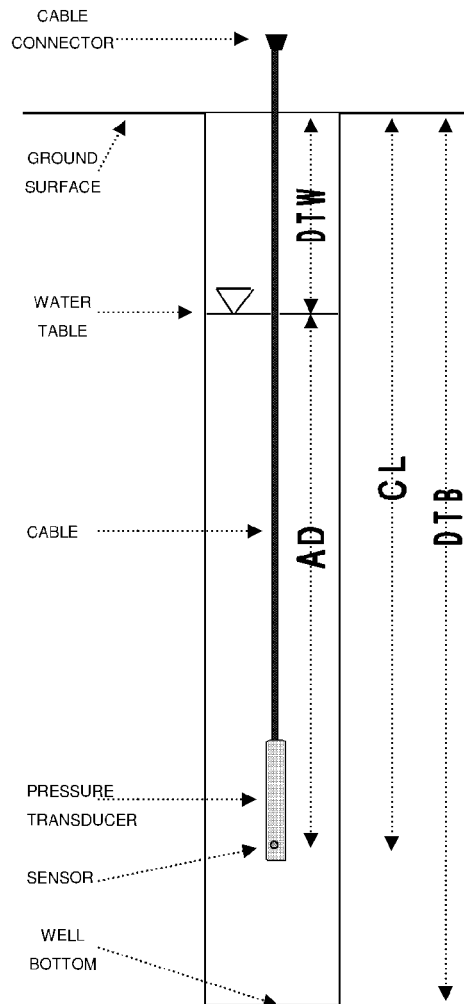
STATIC GROUNDWATER TABLE ELEVATION (FT) 2.33

GZA ENGINEER M. Britos C. Benmergui

ELEVATION OF MEASURING POINT - DEPTH TO WATER = REFERENCE ELEVATION (WATER TABLE ELEVATION)

DEPTH TO WATER + ACTUAL DEPTH = CABLE LENGTH (if transducer is functioning properly)

DEPTH TO BOTTOM:	<u>--</u>		FT
GROUND ELEVATION:	<u>14.99</u>		FT M.S.L.
CASING ELEVATION:	<u>18.50</u>		FT M.S.L.
CASING ABOVE (+) OR BELOW (-) GROUND:	<u>above</u>		
DISTANCE FROM CASING TO GROUND (+ OR -):	<u>3.50</u>		FT
MEASURED CABLE LENGTH	<u>--</u>		FT
TIME OF MEASUREMENT:	<u>10:20</u>		HRS
MEASUREMENT TAKEN FROM:	<u>TOC</u>		
DEPTH TO WATER:	<u>16.17</u>		FT
ACTUAL DEPTH:	<u>+ 7.981</u>		FT
THEORETICAL CABLE LENGTH:	<u>= 24.151</u>		FT
HAVE CLOCKS BEEN SYNCHRONIZED?	<input checked="" type="checkbox"/>	check	
IS TRANSDUCER SET TO TAKE "SURFACE" READINGS?	<input checked="" type="checkbox"/>	check	
ELEVATION OF MEASURING POINT:	<u>18.50</u>		FT M.S.L.
DEPTH TO WATER:	<u>- 16.17</u>		FT
REFERENCE ELEVATION:	<u>= 2.33</u>		FT M.S.L.
TEST NAME:	<u>HR-1</u>		
LOGGING INTERVAL:	<u>20</u>		MIN
TEST START TIME:	<u>10:20</u>		HRS



LEGEND: DTW - DEPTH TO WATER
 DTB - DEPTH TO BOTTOM OF WELL
 AD - ACTUAL DEPTH OF TRANSDUCER UNDER WATER
 CL - CABLE LENGTH FROM SENSOR TO GROUND SURFACE/ TOP OF CASING

NOTES:
 Replaced water damaged transducer and cable.
 Start new test. E-2 batteries.

GZA

WELL ID : HR-1

TRANSDUCER INSTALLATION LOG

GZA GEOENVIRONMENTAL OF NEW YORK 440 NINTH AVENUE, 18th FLOOR NEW YORK, NEW YORK 10001 SCIENTISTS AND ENGINEERS	Client	WELL ID	HR-1-2n
	Entergy	SHEET	1 of 1
	Indian Point Energy Center	FILE NO.	01.0017869.91
		PROJECT LOCATION	Indian Point

MANUFACTURER	In-Situ	FINAL BORING DEPTH (FT)	--	DATUM	NGVD 29
MAKE	MiniTroll	GROUND ELEVATION (FT)	14.99	DATE	5/21/10
PSI CAPACITY	30	CASING ELEVATION (FT)	18.50		
SERIAL NUMBER	16593	CASING DIAMETER (INCH)	2		

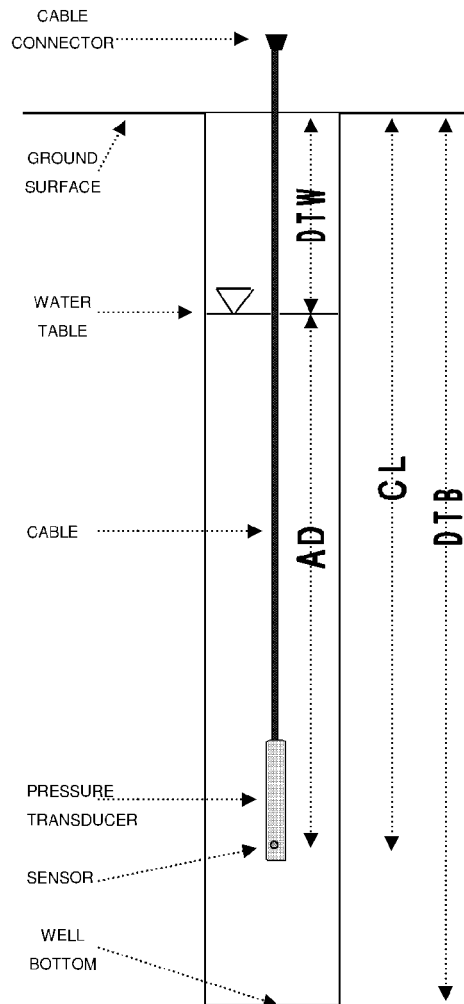
STATIC GROUNDWATER TABLE ELEVATION (FT) -0.95

GZA ENGINEER M. Britos

ELEVATION OF MEASURING POINT - DEPTH TO WATER = REFERENCE ELEVATION (WATER TABLE ELEVATION)

DEPTH TO WATER + ACTUAL DEPTH = CABLE LENGTH (if transducer is functioning properly)

DEPTH TO BOTTOM:	--	FT
GROUND ELEVATION:	14.99	FT M.S.L.
CASING ELEVATION:	18.50	FT M.S.L.
CASING ABOVE (+) OR BELOW (-) GROUND:	above	
DISTANCE FROM CASING TO GROUND (+ OR -):	3.50	FT
MEASURED CABLE LENGTH	--	FT
TIME OF MEASUREMENT:	11:31	HRS
MEASUREMENT TAKEN FROM:	TOC	
DEPTH TO WATER:	19.45	FT
ACTUAL DEPTH:	+ -8.221	FT
THEORETICAL CABLE LENGTH:	= 11.229	FT
HAVE CLOCKS BEEN SYNCHRONIZED?	<input checked="" type="checkbox"/>	check
IS TRANSDUCER SET TO TAKE "SURFACE" READINGS?	<input checked="" type="checkbox"/>	check
ELEVATION OF MEASURING POINT:	18.50	FT M.S.L.
DEPTH TO WATER:	- 19.45	FT
REFERENCE ELEVATION:	= -0.95	FT M.S.L.
TEST NAME:	HR-1	
LOGGING INTERVAL:	20	MIN
TEST START TIME:	11:31	HRS



LEGEND: DTW - DEPTH TO WATER
 DTB - DEPTH TO BOTTOM OF WELL
 AD - ACTUAL DEPTH OF TRANSDUCER UNDER WATER
 CL - CABLE LENGTH FROM SENSOR TO GROUND SURFACE/ TOP OF CASING

NOTES: Difference 53.368. reset.

TRANSDUCER INSTALLATION LOG

GZA GEOENVIRONMENTAL OF NEW YORK 440 NINTH AVENUE, 18th FLOOR NEW YORK, NEW YORK 10001 SCIENTISTS AND ENGINEERS	Client	WELL ID	MW-36-24
	Entergy	SHEET	1 of 1
	Indian Point Energy Center	FILE NO.	01.0017869.91
		PROJECT LOCATION	Indian Point

MANUFACTURER	<u>In-Situ</u>	FINAL BORING DEPTH (FT)	<u>54.00</u>	DATUM	<u>NGVD 29</u>
MAKE	<u>MiniTroll</u>	GROUND ELEVATION (FT)	<u>11.799</u>	DATE	<u>4/28/10</u>
PSI CAPACITY	<u>30</u>	CASING ELEVATION (FT)	<u>11.598</u>		
SERIAL NUMBER	<u>5376</u>	CASING DIAMETER (INCH)	<u>2</u>		

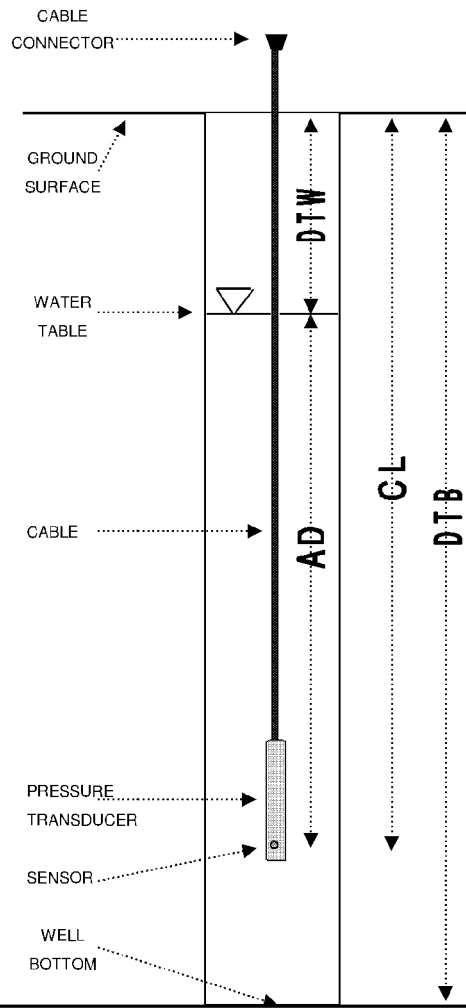
STATIC GROUNDWATER TABLE ELEVATION (FT) 6.74

GZA ENGINEER M. Britos C. Benmergui

ELEVATION OF MEASURING POINT - DEPTH TO WATER = REFERENCE ELEVATION (WATER TABLE ELEVATION)

DEPTH TO WATER + ACTUAL DEPTH = CABLE LENGTH (if transducer is functioning properly)

DEPTH TO BOTTOM:	<u>24.00</u>	FT
GROUND ELEVATION:	<u>11.799</u>	FT M.S.L.
CASING ELEVATION:	<u>11.598</u>	FT M.S.L.
CASING ABOVE (+) OR BELOW (-) GROUND:	<u>below</u>	
DISTANCE FROM CASING TO GROUND (+ OR -):	<u>-0.201</u>	FT
	<u>--</u>	FT
TIME OF MEASUREMENT:	<u>10:47</u>	HRS
MEASUREMENT TAKEN FROM:	<u>TOC</u>	
DEPTH TO WATER:	<u>4.86</u>	FT
ACTUAL DEPTH:	<u>+ 51.887</u>	FT
THEORETICAL CABLE LENGTH:	<u>= 56.747</u>	FT
HAVE CLOCKS BEEN SYNCHRONIZED?	<input checked="" type="checkbox"/>	check
IS TRANSDUCER SET TO TAKE "SURFACE" READINGS?	<input checked="" type="checkbox"/>	check
ELEVATION OF MEASURING POINT:	<u>11.598</u>	FT M.S.L.
DEPTH TO WATER:	<u>- 4.86</u>	FT
REFERENCE ELEVATION:	<u>= 6.738</u>	FT M.S.L.
TEST NAME:	<u>MW-36-24</u>	
LOGGING INTERVAL:	<u>20</u>	MIN
TEST START TIME:	<u>10:47</u>	HRS



LEGEND: DTW - DEPTH TO WATER
 DTB - DEPTH TO BOTTOM OF WELL
 AD - ACTUAL DEPTH OF TRANSDUCER UNDER WATER
 CL - CABLE LENGTH FROM SENSOR TO GROUND SURFACE/ TOP OF CASING

NOTES: Difference -5.672, Reset.

TRANSDUCER INSTALLATION LOG

GZA GEOENVIRONMENTAL OF NEW YORK 440 NINTH AVENUE, 18th FLOOR NEW YORK, NEW YORK 10001 SCIENTISTS AND ENGINEERS	Client	WELL ID	MW-37-32
	Entergy	SHEET	1 of 1
	Indian Point Energy Center	FILE NO.	01.0017869.91
		PROJECT LOCATION	Indian Point

MANUFACTURER	<u>In-Situ</u>	FINAL BORING DEPTH (FT)	<u>57.00</u>	DATUM	<u>NGVD 29</u>
MAKE	<u>MiniTroll</u>	GROUND ELEVATION (FT)	<u>15.021</u>	DATE	<u>4/27/10</u>
PSI CAPACITY	<u>30</u>	CASING ELEVATION (FT)	<u>14.791</u>		
SERIAL NUMBER	<u>6100</u>	CASING DIAMETER (INCH)	<u>1</u>		

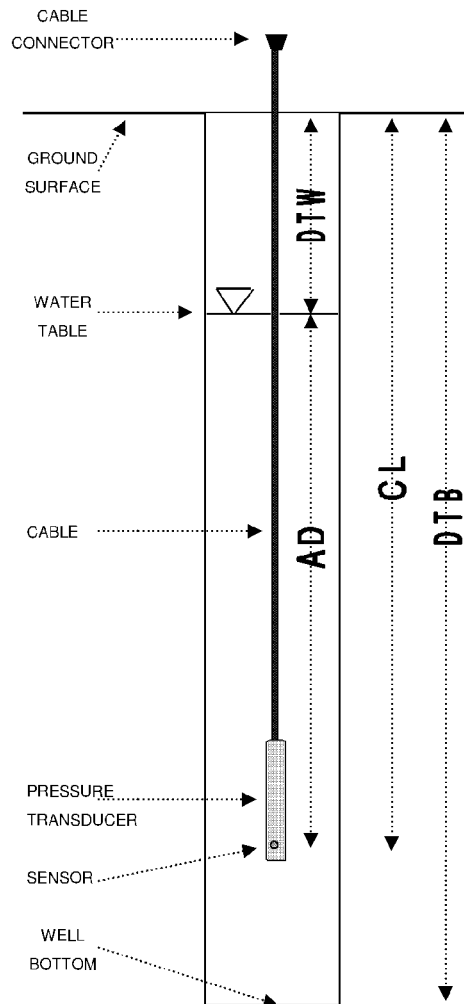
STATIC GROUNDWATER TABLE ELEVATION (FT) 5.19

GZA ENGINEER M. Britos C. Benmergui

ELEVATION OF MEASURING POINT - DEPTH TO WATER = REFERENCE ELEVATION (WATER TABLE ELEVATION)

DEPTH TO WATER + ACTUAL DEPTH = CABLE LENGTH (if transducer is functioning properly)

DEPTH TO BOTTOM:	<u>32.00</u>	FT
GROUND ELEVATION:	<u>15.021</u>	FT M.S.L.
CASING ELEVATION:	<u>14.791</u>	FT M.S.L.
CASING ABOVE (+) OR BELOW (-) GROUND:	<u>below</u>	
DISTANCE FROM CASING TO GROUND (+ OR -):	<u>-0.230</u>	FT
MEASURED CABLE LENGTH:	<u>--</u>	FT
TIME OF MEASUREMENT:	<u>14:35</u>	HRS
MEASUREMENT TAKEN FROM:	<u>TOC</u>	
DEPTH TO WATER:	<u>9.60</u>	FT
ACTUAL DEPTH:	<u>+ 14.919</u>	FT
THEORETICAL CABLE LENGTH:	<u>= 24.519</u>	FT
HAVE CLOCKS BEEN SYNCHRONIZED?	<input checked="" type="checkbox"/>	check
IS TRANSDUCER SET TO TAKE "SURFACE" READINGS?	<input checked="" type="checkbox"/>	check
ELEVATION OF MEASURING POINT:	<u>14.791</u>	FT M.S.L.
DEPTH TO WATER:	<u>- 9.60</u>	FT
REFERENCE ELEVATION:	<u>= 5.191</u>	FT M.S.L.
TEST NAME:	<u>MW-37-32</u>	
LOGGING INTERVAL:	<u>20</u>	MIN
TEST START TIME:	<u>14:35</u>	HRS



LEGEND: DTW - DEPTH TO WATER
 DTB - DEPTH TO BOTTOM OF WELL
 AD - ACTUAL DEPTH OF TRANSDUCER UNDER WATER
 CL - CABLE LENGTH FROM SENSOR TO GROUND SURFACE/ TOP OF CASING

NOTES:
 Replaced batteries

GZA

WELL ID : MW-37-32

TRANSDUCER INSTALLATION LOG

GZA GEOENVIRONMENTAL OF NEW YORK 440 NINTH AVENUE, 18th FLOOR NEW YORK, NEW YORK 10001 SCIENTISTS AND ENGINEERS	Client	WELL ID	MW-37-40
	Entergy	SHEET	1 of 1
	Indian Point Energy Center	FILE NO.	01.0017869.91
		PROJECT LOCATION	Indian Point

MANUFACTURER	In-Situ	FINAL BORING DEPTH (FT)	57.00	DATUM	NGVD 29
MAKE	MiniTroll	GROUND ELEVATION (FT)	15.021	DATE	4/27/10
PSI CAPACITY	30	CASING ELEVATION (FT)	14.852		
SERIAL NUMBER	2280	CASING DIAMETER (INCH)	1		

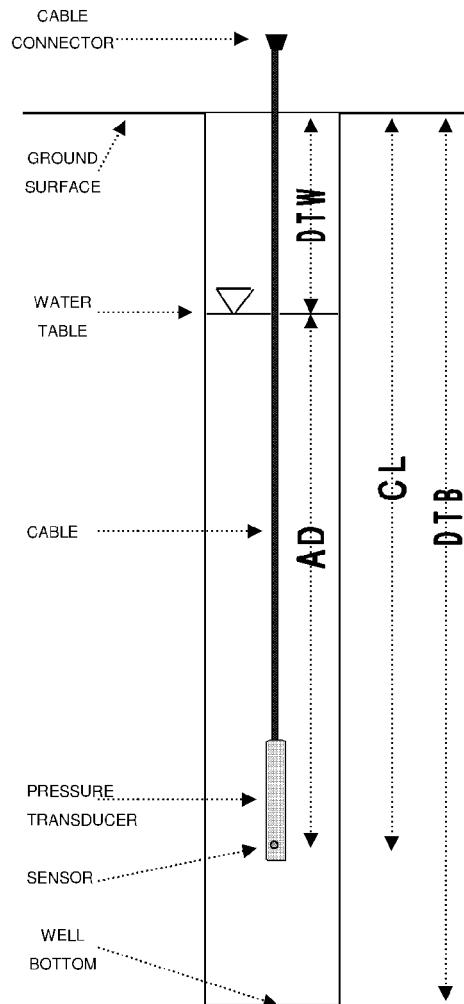
STATIC GROUNDWATER TABLE ELEVATION (FT) * 6.68

GZA ENGINEER M. Britos C. Benmergui

ELEVATION OF MEASURING POINT - DEPTH TO WATER = REFERENCE ELEVATION (WATER TABLE ELEVATION)

DEPTH TO WATER + ACTUAL DEPTH = CABLE LENGTH (if transducer is functioning properly)

DEPTH TO BOTTOM:	<u>40.00</u>	FT
GROUND ELEVATION:	<u>15.021</u>	FT M.S.L.
CASING ELEVATION:	<u>14.852</u>	FT M.S.L.
CASING ABOVE (+) OR BELOW (-) GROUND:	<u>below</u>	
DISTANCE FROM CASING TO GROUND (+ OR -):	<u>-0.169</u>	FT
MEASURED CABLE LENGTH:	<u>--</u>	FT
TIME OF MEASUREMENT:	<u>10:46</u>	HRS
MEASUREMENT TAKEN FROM:	<u>TOC</u>	
DEPTH TO WATER:	<u>8.17</u>	*FT
ACTUAL DEPTH:	<u>+ 32.200</u>	FT
THEORETICAL CABLE LENGTH:	<u>= 40.370</u>	FT
HAVE CLOCKS BEEN SYNCHRONIZED?	<input checked="" type="checkbox"/>	check
IS TRANSDUCER SET TO TAKE "SURFACE" READINGS?	<input checked="" type="checkbox"/>	check
ELEVATION OF MEASURING POINT:	<u>14.852</u>	FT M.S.L.
DEPTH TO WATER:	<u>- 8.17</u>	*FT
REFERENCE ELEVATION:	<u>= 6.682</u>	*FT M.S.L.
TEST NAME:	<u>MW-37-40</u>	
LOGGING INTERVAL:	<u>20</u>	MIN
TEST START TIME:	<u>10:46</u>	HRS



LEGEND: DTW - DEPTH TO WATER
 DTB - DEPTH TO BOTTOM OF WELL
 AD - ACTUAL DEPTH OF TRANSDUCER UNDER WATER
 CL - CABLE LENGTH FROM SENSOR TO GROUND SURFACE/ TOP OF CASING

NOTES:
 Difference= 0.462

GZA

WELL ID : MW-37-40

TRANSDUCER INSTALLATION LOG

GZA GEOENVIRONMENTAL OF NEW YORK 440 NINTH AVENUE, 18th FLOOR NEW YORK, NEW YORK 10001 SCIENTISTS AND ENGINEERS	Client	WELL ID	MW-37-57
	Entergy	SHEET	1 of 1
	Indian Point Energy Center	FILE NO.	01.0017869.91
		PROJECT LOCATION	Indian Point

MANUFACTURER	In-Situ	FINAL BORING DEPTH (FT)	57.00	DATUM	NGVD 29
MAKE	MiniTroll	GROUND ELEVATION (FT)	15.021	DATE	4/27/10
PSI CAPACITY	30	CASING ELEVATION (FT)	14.788		
SERIAL NUMBER	11802	CASING DIAMETER (INCH)	1		

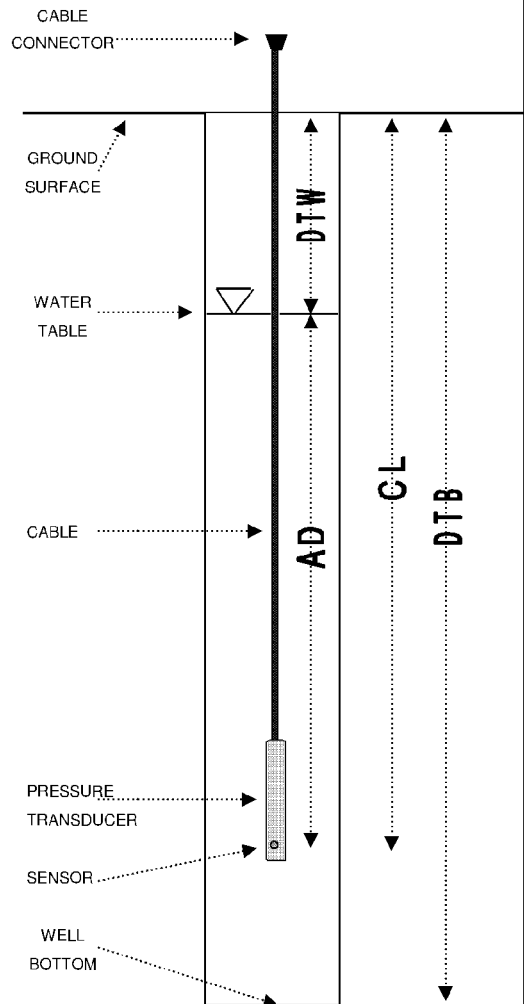
STATIC GROUNDWATER TABLE ELEVATION (FT) 6.57

GZA ENGINEER M. Britos C. Benmergui

ELEVATION OF MEASURING POINT - DEPTH TO WATER = REFERENCE ELEVATION (WATER TABLE ELEVATION)

DEPTH TO WATER + ACTUAL DEPTH = CABLE LENGTH (if transducer is functioning properly)

DEPTH TO BOTTOM:	<u>56.50</u>	FT
GROUND ELEVATION:	<u>15.021</u>	FT M.S.L.
CASING ELEVATION:	<u>14.788</u>	FT M.S.L.
CASING ABOVE (+) OR BELOW (-) GROUND:	below	
DISTANCE FROM CASING TO GROUND (+ OR -):	<u>-0.233</u>	FT
MEASURED CABLE LENGTH:	--	FT
TIME OF MEASUREMENT:	<u>15:01</u>	HRS
MEASUREMENT TAKEN FROM:	<u>TOC</u>	
DEPTH TO WATER:	<u>8.22</u>	FT
ACTUAL DEPTH:	<u>+ 42.490</u>	FT
THEORETICAL CABLE LENGTH:	<u>= 50.710</u>	FT
HAVE CLOCKS BEEN SYNCHRONIZED?	<input checked="" type="checkbox"/>	check
IS TRANSDUCER SET TO TAKE "SURFACE" READINGS?	<input checked="" type="checkbox"/>	check
ELEVATION OF MEASURING POINT:	<u>14.788</u>	FT M.S.L.
DEPTH TO WATER:	<u>- 8.22</u>	FT
REFERENCE ELEVATION:	<u>= 6.568</u>	FT M.S.L.
TEST NAME:	<u>MW-37-57</u>	
LOGGING INTERVAL:	<u>20</u>	MIN
TEST START TIME:	<u>15:04</u>	HRS



LEGEND: DTW - DEPTH TO WATER
 DTB - DEPTH TO BOTTOM OF WELL
 AD - ACTUAL DEPTH OF TRANSDUCER UNDER WATER
 CL - CABLE LENGTH FROM SENSOR TO GROUND SURFACE/ TOP OF CASING

NOTES:
 Batteries E-2

TRANSDUCER INSTALLATION LOG

GZA GEOENVIRONMENTAL OF NEW YORK 440 NINTH AVENUE, 18th FLOOR NEW YORK, NEW YORK 10001 SCIENTISTS AND ENGINEERS	Client	WELL ID	MW-41-40
	Entergy	SHEET	1 of 1
	Indian Point Energy Center	FILE NO.	01.0017869.91
		PROJECT LOCATION	Indian Point

MANUFACTURER	In-Situ	FINAL BORING DEPTH (FT)	64.00	DATUM	NGVD 29
MAKE	MiniTroll	GROUND ELEVATION (FT)	54.87	DATE	4/19/10
PSI CAPACITY	30	CASING ELEVATION (FT)	54.13		
SERIAL NUMBER		CASING DIAMETER (INCH)	2		

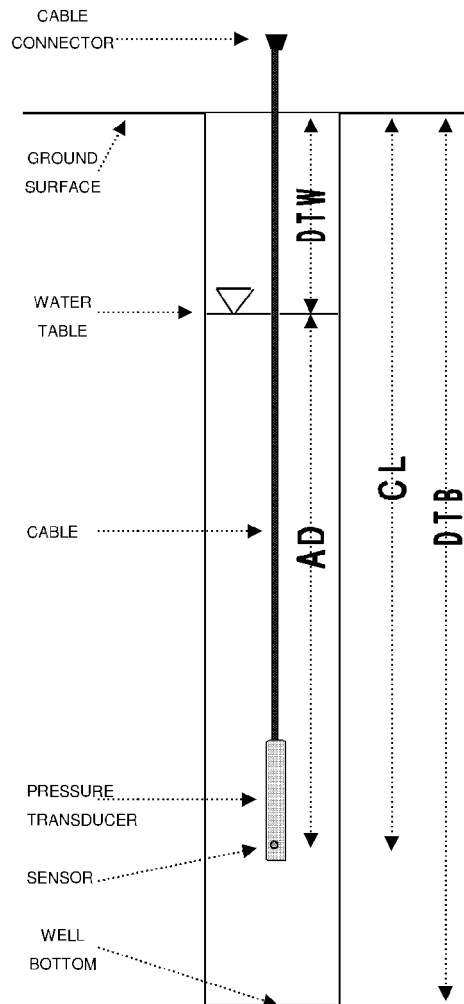
STATIC GROUNDWATER TABLE ELEVATION (FT) 31.60

GZA ENGINEER M. Britos C. Benmergui

ELEVATION OF MEASURING POINT - DEPTH TO WATER = REFERENCE ELEVATION (WATER TABLE ELEVATION)

DEPTH TO WATER + ACTUAL DEPTH = CABLE LENGTH (if transducer is functioning properly)

DEPTH TO BOTTOM:	<u>40.00</u>	FT
GROUND ELEVATION:	<u>54.87</u>	FT M.S.L.
CASING ELEVATION:	<u>54.13</u>	FT M.S.L.
CASING ABOVE (+) OR BELOW (-) GROUND:	<u>below</u>	
DISTANCE FROM CASING TO GROUND (+ OR -):	<u>-0.74</u>	FT
MEASURED CABLE LENGTH:	<u>--</u>	FT
TIME OF MEASUREMENT:	<u>11:59</u>	HRS
MEASUREMENT TAKEN FROM:	<u>TOC</u>	
DEPTH TO WATER:	<u>22.53</u>	FT
ACTUAL DEPTH:	<u>+ 31.302</u>	FT
THEORETICAL CABLE LENGTH:	<u>= 53.832</u>	FT
HAVE CLOCKS BEEN SYNCHRONIZED?	<input checked="" type="checkbox"/>	check
IS TRANSDUCER SET TO TAKE "SURFACE" READINGS?	<input checked="" type="checkbox"/>	check
ELEVATION OF MEASURING POINT:	<u>54.13</u>	FT M.S.L.
DEPTH TO WATER:	<u>- 22.53</u>	FT
REFERENCE ELEVATION:	<u>= 31.60</u>	FT M.S.L.
TEST NAME:	<u>MW-41-40</u>	
LOGGING INTERVAL:	<u>20</u>	MIN
TEST START TIME:	<u>11:59</u>	HRS



LEGEND: DTW - DEPTH TO WATER
 DTB - DEPTH TO BOTTOM OF WELL
 AD - ACTUAL DEPTH OF TRANSDUCER UNDER WATER
 CL - CABLE LENGTH FROM SENSOR TO GROUND SURFACE/ TOP OF CASING

NOTES:
 Difference=2.763. Reset.

GZA

WELL ID : MW-41-40

TRANSDUCER INSTALLATION LOG

GZA GEOENVIRONMENTAL OF NEW YORK 440 NINTH AVENUE, 18th FLOOR NEW YORK, NEW YORK 10001 SCIENTISTS AND ENGINEERS	Client	WELL ID	MW42-78
	Entergy	SHEET	1 of 1
	Indian Point Energy Center	FILE NO.	01.0017869.91
		PROJECT LOCATION	Indian Point

MANUFACTURER	In-Situ	FINAL BORING DEPTH (FT)	80.00	DATUM	NGVD 29
MAKE	MiniTroll	GROUND ELEVATION (FT)	69.714	DATE	4/16/10
PSI CAPACITY	30	CASING ELEVATION (FT)	69.524		
SERIAL NUMBER	16626	CASING DIAMETER (INCH)	1		

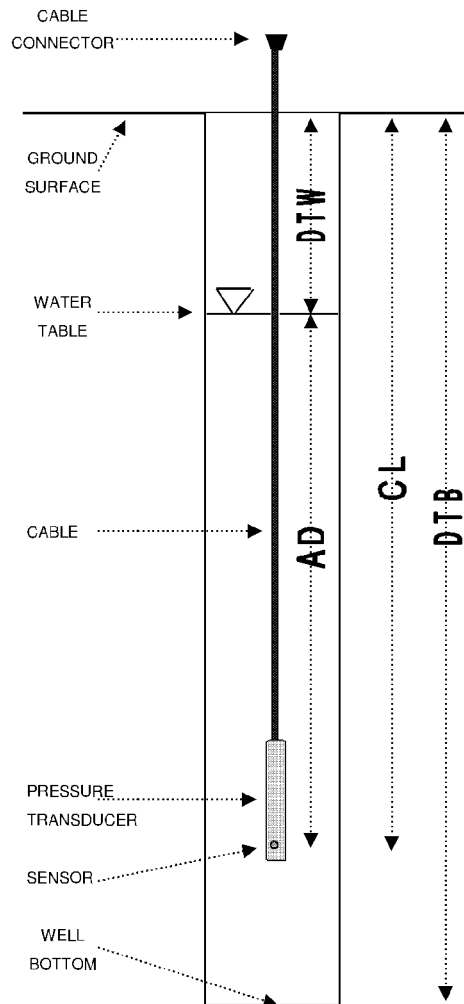
STATIC GROUNDWATER TABLE ELEVATION (FT) 35.85

GZA ENGINEER M. Britos C. Benmergui

ELEVATION OF MEASURING POINT - DEPTH TO WATER = REFERENCE ELEVATION (WATER TABLE ELEVATION)

DEPTH TO WATER + ACTUAL DEPTH = CABLE LENGTH (if transducer is functioning properly)

DEPTH TO BOTTOM:	<u>78.00</u>	FT
GROUND ELEVATION:	<u>69.71</u>	FT M.S.L.
CASING ELEVATION:	<u>69.52</u>	FT M.S.L.
CASING ABOVE (+) OR BELOW (-) GROUND:	<u>below</u>	
DISTANCE FROM CASING TO GROUND (+ OR -):	<u>-0.19</u>	FT
MEASURED CABLE LENGTH:	<u>--</u>	FT
TIME OF MEASUREMENT:	<u>11:11</u>	HRS
MEASUREMENT TAKEN FROM:	<u>TOC</u>	
DEPTH TO WATER:	<u>33.67</u>	FT
ACTUAL DEPTH:	<u>+ 43.948</u>	FT
THEORETICAL CABLE LENGTH:	<u>= 77.618</u>	FT
HAVE CLOCKS BEEN SYNCHRONIZED?	<input checked="" type="checkbox"/>	check
IS TRANSDUCER SET TO TAKE "SURFACE" READINGS?	<input checked="" type="checkbox"/>	check
ELEVATION OF MEASURING POINT:	<u>69.524</u>	FT M.S.L.
DEPTH TO WATER:	<u>- 33.67</u>	FT
REFERENCE ELEVATION:	<u>= 35.854</u>	FT M.S.L.
TEST NAME:	<u>MW42-78</u>	
LOGGING INTERVAL:	<u>20</u>	MIN
TEST START TIME:	<u>11:11</u>	HRS



LEGEND: DTW - DEPTH TO WATER
 DTB - DEPTH TO BOTTOM OF WELL
 AD - ACTUAL DEPTH OF TRANSDUCER UNDER WATER
 CL - CABLE LENGTH FROM SENSOR TO GROUND SURFACE/ TOP OF CASING

NOTES:
 Difference= -0.635. reset.

TRANSDUCER INSTALLATION LOG

GZA GEOENVIRONMENTAL OF NEW YORK 440 NINTH AVENUE, 18th FLOOR NEW YORK, NEW YORK 10001 SCIENTISTS AND ENGINEERS	Client	WELL ID	MW-44-67
	Entergy	SHEET	1 of 1
	Indian Point Energy Center	FILE NO.	01.0017869.91
		PROJECT LOCATION	Indian Point

MANUFACTURER	In-Situ	FINAL BORING DEPTH (FT)	105.00	DATUM	NGVD 29
MAKE	MiniTroll	GROUND ELEVATION (FT)	93.52	DATE	6/10/10
PSI CAPACITY	30	CASING ELEVATION (FT)	93.02		
SERIAL NUMBER	16108	CASING DIAMETER (INCH)	2		

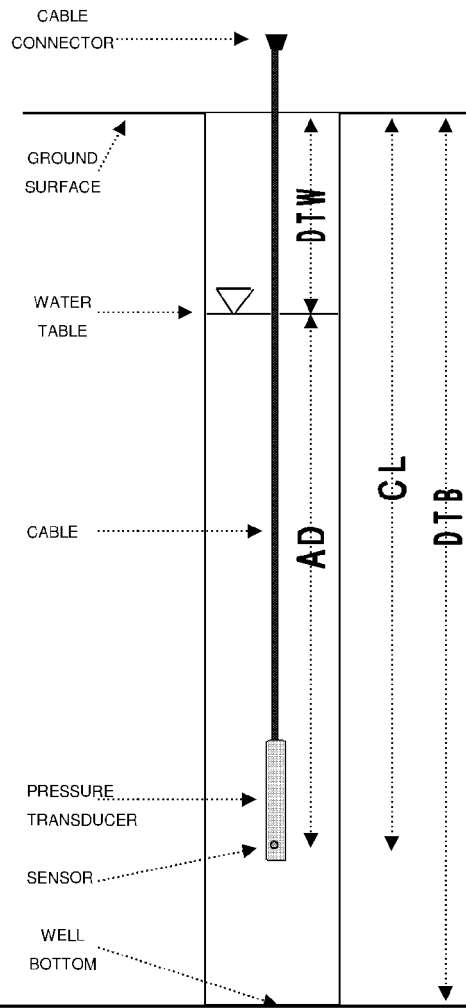
STATIC GROUNDWATER TABLE ELEVATION (FT) 29.07

GZA ENGINEER M. Britos A. Altieri

ELEVATION OF MEASURING POINT - DEPTH TO WATER = REFERENCE ELEVATION (WATER TABLE ELEVATION)

DEPTH TO WATER + ACTUAL DEPTH = CABLE LENGTH (if transducer is functioning properly)

DEPTH TO BOTTOM:	<u>67.00</u>	FT
GROUND ELEVATION:	<u>93.52</u>	FT M.S.L.
CASING ELEVATION:	<u>93.02</u>	FT M.S.L.
CASING ABOVE (+) OR BELOW (-) GROUND:	<u>below</u>	
DISTANCE FROM CASING TO GROUND (+ OR -):	<u>0.50</u>	FT
MEASURED CABLE LENGTH:	<u>--</u>	FT
TIME OF MEASUREMENT:	<u>15:49</u>	HRS
MEASUREMENT TAKEN FROM:	<u>TOC</u>	
DEPTH TO WATER:	<u>63.95</u>	FT
ACTUAL DEPTH:	<u>+ 1.816</u>	FT
THEORETICAL CABLE LENGTH:	<u>= 65.766</u>	FT
HAVE CLOCKS BEEN SYNCHRONIZED?	<input checked="" type="checkbox"/>	check
IS TRANSDUCER SET TO TAKE "SURFACE" READINGS?	<input checked="" type="checkbox"/>	check
ELEVATION OF MEASURING POINT:	<u>93.02</u>	FT M.S.L.
DEPTH TO WATER:	<u>- 63.95</u>	FT
REFERENCE ELEVATION:	<u>= 29.07</u>	FT M.S.L.
TEST NAME:	<u>MW-44-67</u>	
LOGGING INTERVAL:	<u>20</u>	MIN
TEST START TIME:	<u>15:49</u>	HRS



LEGEND: DTW - DEPTH TO WATER
 DTB - DEPTH TO BOTTOM OF WELL
 AD - ACTUAL DEPTH OF TRANSDUCER UNDER WATER
 CL - CABLE LENGTH FROM SENSOR TO GROUND SURFACE/ TOP OF CASING

NOTES:
 No connection. Replaced batteries E-2.
 Synchronized clock.
 Used Rugged Reader #1.

TRANSDUCER INSTALLATION LOG

GZA GEOENVIRONMENTAL OF NEW YORK 440 NINTH AVENUE, 18th FLOOR NEW YORK, NEW YORK 10001 SCIENTISTS AND ENGINEERS	Client	WELL ID	MW-44-102
	Entergy	SHEET	1 of 1
	Indian Point Energy Center	FILE NO.	01.0017869.91
		PROJECT LOCATION	Indian Point

MANUFACTURER	In-Situ	FINAL BORING DEPTH (FT)	102.00	DATUM	NGVD 29
MAKE	MiniTroll	GROUND ELEVATION (FT)	93.52	DATE	6/10/10
PSI CAPACITY	30	CASING ELEVATION (FT)	93.09		
SERIAL NUMBER	15940	CASING DIAMETER (INCH)	1		

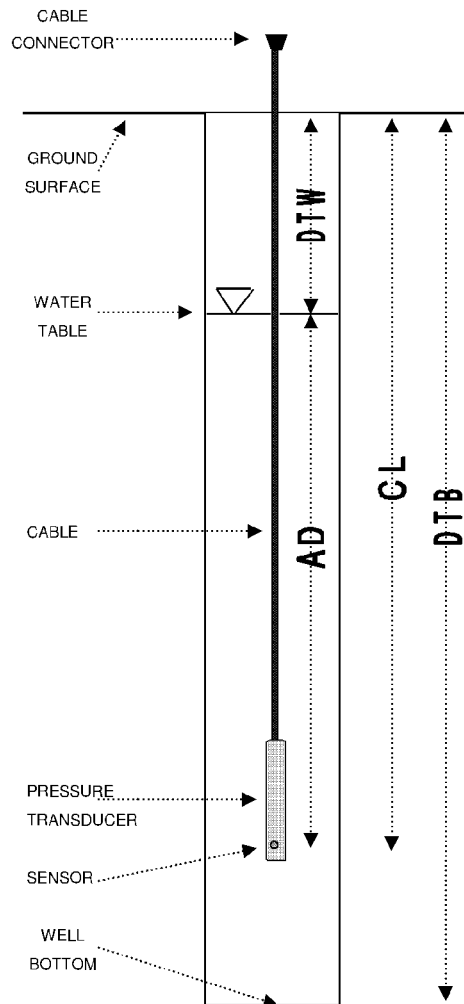
STATIC GROUNDWATER TABLE ELEVATION (FT) 24.97

GZA ENGINEER M. Britos

ELEVATION OF MEASURING POINT - DEPTH TO WATER = REFERENCE ELEVATION (WATER TABLE ELEVATION)

DEPTH TO WATER + ACTUAL DEPTH = CABLE LENGTH (if transducer is functioning properly)

DEPTH TO BOTTOM:	<u>102.00</u>	FT
GROUND ELEVATION:	<u>93.52</u>	FT M.S.L.
CASING ELEVATION:	<u>93.09</u>	FT M.S.L.
CASING ABOVE (+) OR BELOW (-) GROUND:	<u>below</u>	
DISTANCE FROM CASING TO GROUND (+ OR -):	<u>-0.43</u>	FT
MEASURED CABLE LENGTH:	<u>--</u>	FT
TIME OF MEASUREMENT:	<u>14:57</u>	HRS
MEASUREMENT TAKEN FROM:	<u>TOC</u>	
DEPTH TO WATER:	<u>68.12</u>	FT
ACTUAL DEPTH:	<u>+ 30.630</u>	FT
THEORETICAL CABLE LENGTH:	<u>= 98.750</u>	FT
HAVE CLOCKS BEEN SYNCHRONIZED?	<input checked="" type="checkbox"/>	check
IS TRANSDUCER SET TO TAKE "SURFACE" READINGS?	<input checked="" type="checkbox"/>	check
ELEVATION OF MEASURING POINT:	<u>93.09</u>	FT M.S.L.
DEPTH TO WATER:	<u>- 68.12</u>	FT
REFERENCE ELEVATION:	<u>= 24.97</u>	FT M.S.L.
TEST NAME:	<u>MW-44-102</u>	
LOGGING INTERVAL:	<u>20</u>	MIN
TEST START TIME:	<u>14:57</u>	HRS



LEGEND: DTW - DEPTH TO WATER
 DTB - DEPTH TO BOTTOM OF WELL
 AD - ACTUAL DEPTH OF TRANSDUCER UNDER WATER
 CL - CABLE LENGTH FROM SENSOR TO GROUND SURFACE/ TOP OF CASING

NOTES:
 E-2. synchronized clock.

TRANSDUCER INSTALLATION LOG

GZA GEOENVIRONMENTAL OF NEW YORK 440 NINTH AVENUE, 18th FLOOR NEW YORK, NEW YORK 10001 SCIENTISTS AND ENGINEERS	Client	WELL ID	MW-50-66
	Entergy	SHEET	1 of 1
	Indian Point Energy Center	FILE NO.	01.0017869.91
		PROJECT LOCATION	Indian Point

MANUFACTURER	In-Situ	FINAL BORING DEPTH (FT)	67.00	DATUM	NGVD 29
MAKE	MiniTroll	GROUND ELEVATION (FT)	14.92	DATE	4/30/10
PSI CAPACITY	30	CASING ELEVATION (FT)	14.61		
SERIAL NUMBER	14459	CASING DIAMETER (INCH)	1		

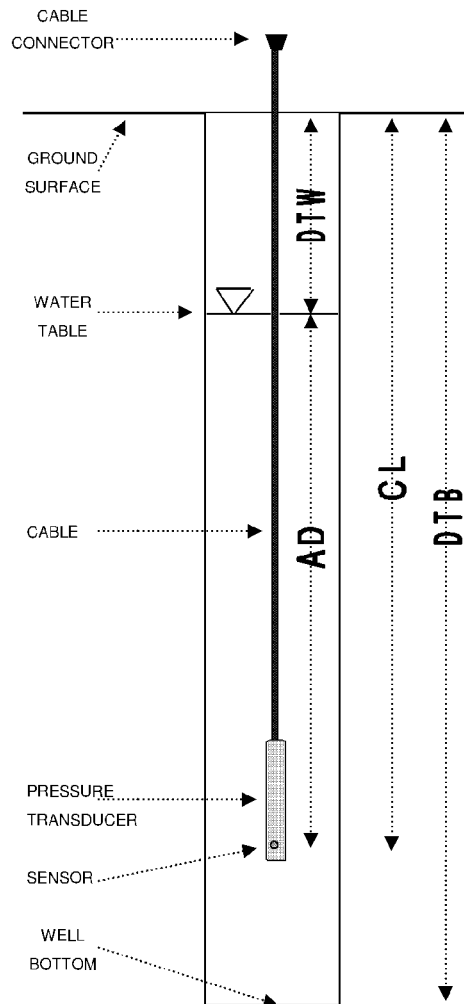
STATIC GROUNDWATER TABLE ELEVATION (FT) 3.57

GZA ENGINEER C. Benmergui

ELEVATION OF MEASURING POINT - DEPTH TO WATER = REFERENCE ELEVATION (WATER TABLE ELEVATION)

DEPTH TO WATER + ACTUAL DEPTH = CABLE LENGTH (if transducer is functioning properly)

DEPTH TO BOTTOM:	<u>65.75</u>	FT
GROUND ELEVATION:	<u>14.92</u>	FT M.S.L.
CASING ELEVATION:	<u>14.61</u>	FT M.S.L.
CASING ABOVE (+) OR BELOW (-) GROUND:	<u>below</u>	
DISTANCE FROM CASING TO GROUND (+ OR -):	<u>-0.31</u>	FT
MEASURED CABLE LENGTH:	<u>--</u>	FT
TIME OF MEASUREMENT:	<u>10:32</u>	HRS
MEASUREMENT TAKEN FROM:	<u>TOC</u>	
DEPTH TO WATER:	<u>11.04</u>	FT
ACTUAL DEPTH:	<u>+ 88.110</u>	FT
THEORETICAL CABLE LENGTH:	<u>= 99.150</u>	FT
HAVE CLOCKS BEEN SYNCHRONIZED?	<input checked="" type="checkbox"/>	check
IS TRANSDUCER SET TO TAKE "SURFACE" READINGS?	<input checked="" type="checkbox"/>	check
ELEVATION OF MEASURING POINT:	<u>14.614</u>	FT M.S.L.
DEPTH TO WATER:	<u>- 11.04</u>	FT
REFERENCE ELEVATION:	<u>= 3.574</u>	FT M.S.L.
TEST NAME:	<u>MW-50-66</u>	
LOGGING INTERVAL:	<u>20</u>	MIN
TEST START TIME:	<u>10:32</u>	HRS



LEGEND: DTW - DEPTH TO WATER
 DTB - DEPTH TO BOTTOM OF WELL
 AD - ACTUAL DEPTH OF TRANSDUCER UNDER WATER
 CL - CABLE LENGTH FROM SENSOR TO GROUND SURFACE/ TOP OF CASING

NOTES: Difference -1.037

TRANSDUCER INSTALLATION LOG

GZA GEOENVIRONMENTAL OF NEW YORK 440 NINTH AVENUE, 18th FLOOR NEW YORK, NEW YORK 10001 SCIENTISTS AND ENGINEERS	Client	WELL ID	MW-56-53
	Entergy	SHEET	1 of 1
	Indian Point Energy Center	FILE NO.	01.0017869.91
		PROJECT LOCATION	Indian Point

MANUFACTURER	<u>In-Situ</u>	FINAL BORING DEPTH (FT)	<u>88.50</u>	DATUM	<u>NGVD 29</u>
MAKE	<u>MiniTroll</u>	GROUND ELEVATION (FT)	<u>70.26</u>	DATE	<u>4/20/10</u>
PSI CAPACITY	<u>30</u>	CASING ELEVATION (FT)	<u>69.32</u>		
SERIAL NUMBER	<u>16499</u>	CASING DIAMETER (INCH)	<u>2</u>		

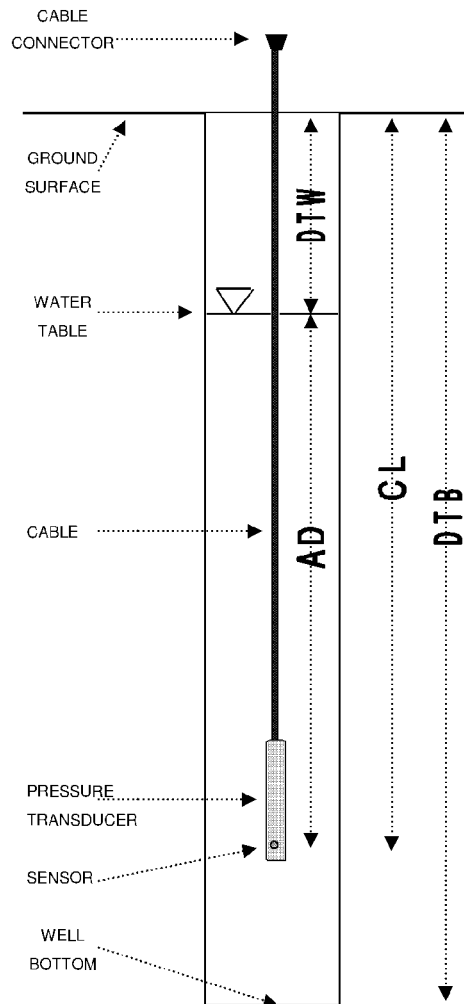
STATIC GROUNDWATER TABLE ELEVATION (FT) 22.51

GZA ENGINEER M. Britos C. Benmergui

ELEVATION OF MEASURING POINT - DEPTH TO WATER = REFERENCE ELEVATION (WATER TABLE ELEVATION)

DEPTH TO WATER + ACTUAL DEPTH = CABLE LENGTH (if transducer is functioning properly)

DEPTH TO BOTTOM:	<u>53.00</u>	FT
GROUND ELEVATION:	<u>70.26</u>	FT M.S.L.
CASING ELEVATION:	<u>69.32</u>	FT M.S.L.
CASING ABOVE (+) OR BELOW (-) GROUND:	<u>below</u>	
DISTANCE FROM CASING TO GROUND (+ OR -):	<u>-0.94</u>	FT
MEASURED CABLE LENGTH:	<u>--</u>	FT
TIME OF MEASUREMENT:	<u>13:35</u>	HRS
MEASUREMENT TAKEN FROM:	<u>TOC</u>	
DEPTH TO WATER:	<u>46.81</u>	FT
ACTUAL DEPTH:	<u>+ 44.098</u>	FT
THEORETICAL CABLE LENGTH:	<u>= 90.908</u>	FT
HAVE CLOCKS BEEN SYNCHRONIZED?	<input checked="" type="checkbox"/>	check
IS TRANSDUCER SET TO TAKE "SURFACE" READINGS?	<input checked="" type="checkbox"/>	check
ELEVATION OF MEASURING POINT:	<u>69.32</u>	FT M.S.L.
DEPTH TO WATER:	<u>- 46.81</u>	FT
REFERENCE ELEVATION:	<u>= 22.51</u>	FT M.S.L.
TEST NAME:	<u>MW-56-53</u>	
LOGGING INTERVAL:	<u>20</u>	MIN
TEST START TIME:	<u>13:35</u>	HRS



LEGEND: DTW - DEPTH TO WATER
 DTB - DEPTH TO BOTTOM OF WELL
 AD - ACTUAL DEPTH OF TRANSDUCER UNDER WATER
 CL - CABLE LENGTH FROM SENSOR TO GROUND SURFACE/ TOP OF CASING

NOTES:

GZA

WELL ID : MW-56-53

TRANSDUCER INSTALLATION LOG

GZA GEOENVIRONMENTAL OF NEW YORK 440 NINTH AVENUE, 18th FLOOR NEW YORK, NEW YORK 10001 SCIENTISTS AND ENGINEERS	Client	WELL ID	MW-56-83
	Entergy	SHEET	1 of 1
	Indian Point Energy Center	FILE NO.	01.0017869.91
		PROJECT LOCATION	Indian Point

MANUFACTURER	In-Situ	FINAL BORING DEPTH (FT)	88.50	DATUM	NGVD 29
MAKE	MiniTroll	GROUND ELEVATION (FT)	70.258	DATE	4/20/10
PSI CAPACITY	30	CASING ELEVATION (FT)	69.207		
SERIAL NUMBER	16394	CASING DIAMETER (INCH)	1		

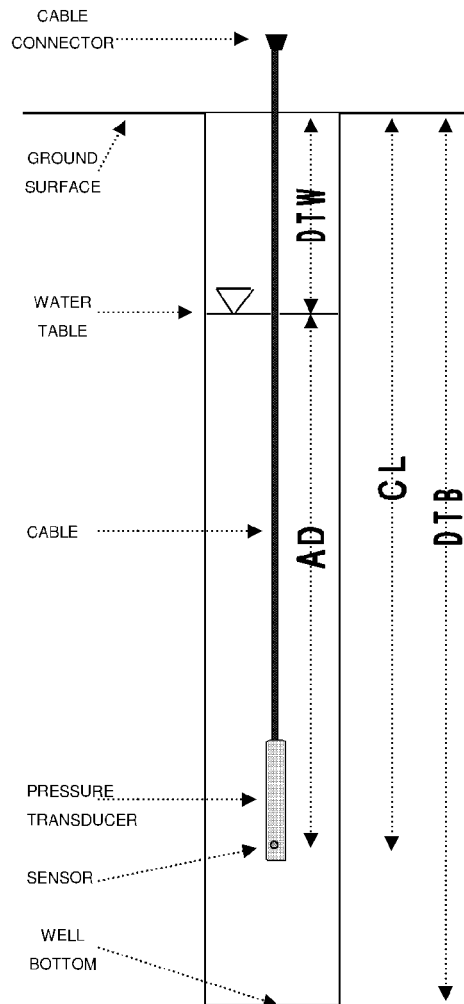
STATIC GROUNDWATER TABLE ELEVATION (FT) 22.36

GZA ENGINEER M. Britos C. Benmergui

ELEVATION OF MEASURING POINT - DEPTH TO WATER = REFERENCE ELEVATION (WATER TABLE ELEVATION)

DEPTH TO WATER + ACTUAL DEPTH = CABLE LENGTH (if transducer is functioning properly)

DEPTH TO BOTTOM:	83.00	FT
GROUND ELEVATION:	70.258	FT M.S.L.
CASING ELEVATION:	69.207	FT M.S.L.
CASING ABOVE (+) OR BELOW (-) GROUND:	below	
DISTANCE FROM CASING TO GROUND (+ OR -):	-1.05	FT
MEASURED CABLE LENGTH:	--	FT
TIME OF MEASUREMENT:	15:51	HRS
MEASUREMENT TAKEN FROM:	TOC	
DEPTH TO WATER:	46.85	FT
ACTUAL DEPTH:	+ 36.777	FT
THEORETICAL CABLE LENGTH:	= 83.627	FT
HAVE CLOCKS BEEN SYNCHRONIZED?	<input checked="" type="checkbox"/>	check
IS TRANSDUCER SET TO TAKE "SURFACE" READINGS?	<input checked="" type="checkbox"/>	check
ELEVATION OF MEASURING POINT:	69.207	FT M.S.L.
DEPTH TO WATER:	- 46.85	FT
REFERENCE ELEVATION:	= 22.357	FT M.S.L.
TEST NAME:	MW-56-83	
LOGGING INTERVAL:	20	MIN
TEST START TIME:	15:51	HRS



LEGEND: DTW - DEPTH TO WATER
 DTB - DEPTH TO BOTTOM OF WELL
 AD - ACTUAL DEPTH OF TRANSDUCER UNDER WATER
 CL - CABLE LENGTH FROM SENSOR TO GROUND SURFACE/ TOP OF CASING

NOTES:
 Difference= +0.384, Replaced batteries, reset.

TRANSDUCER INSTALLATION LOG

GZA GEOENVIRONMENTAL OF NEW YORK 440 NINTH AVENUE, 18th FLOOR NEW YORK, NEW YORK 10001 SCIENTISTS AND ENGINEERS	Client	WELL ID	MW-58-65
	Entergy	SHEET	1 of 1
	Indian Point Energy Center	FILE NO.	01.0017869.91
		PROJECT LOCATION	Indian Point

MANUFACTURER	In-Situ	FINAL BORING DEPTH (FT)	72.00	DATUM	NGVD 29
MAKE	MiniTroll	GROUND ELEVATION (FT)	14.57	DATE	3/31/2010
PSI CAPACITY	30	CASING ELEVATION (FT)	14.25		
SERIAL NUMBER	5619	CASING DIAMETER (INCH)	1		

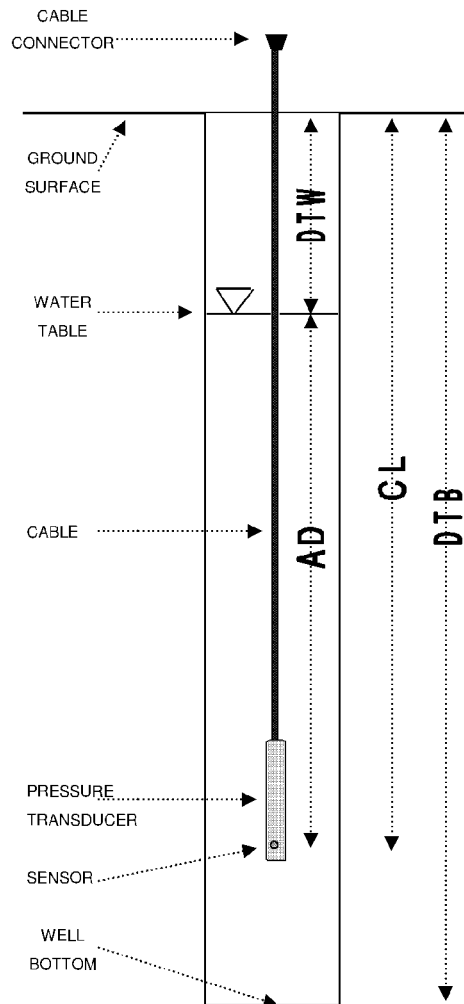
STATIC GROUNDWATER TABLE ELEVATION (FT) 8.36

GZA ENGINEER M. Britos

ELEVATION OF MEASURING POINT - DEPTH TO WATER = REFERENCE ELEVATION (WATER TABLE ELEVATION)

DEPTH TO WATER + ACTUAL DEPTH = CABLE LENGTH (if transducer is functioning properly)

DEPTH TO BOTTOM:	<u>65.00</u>	FT
GROUND ELEVATION:	<u>14.57</u>	FT M.S.L.
CASING ELEVATION:	<u>14.25</u>	FT M.S.L.
CASING ABOVE (+) OR BELOW (-) GROUND:	below	
DISTANCE FROM CASING TO GROUND (+ OR -):	<u>-0.32</u>	FT
MEASURED CABLE LENGTH:	<u>--</u>	FT
TIME OF MEASUREMENT:	<u>13:37</u>	HRS
MEASUREMENT TAKEN FROM:	<u>TOC</u>	
DEPTH TO WATER:	<u>5.89</u>	FT
ACTUAL DEPTH:	<u>+ 63.424</u>	FT
THEORETICAL CABLE LENGTH:	<u>= 69.314</u>	FT
HAVE CLOCKS BEEN SYNCHRONIZED?	<input checked="" type="checkbox"/>	check
IS TRANSDUCER SET TO TAKE "SURFACE" READINGS?	<input checked="" type="checkbox"/>	check
ELEVATION OF MEASURING POINT:	<u>14.25</u>	FT M.S.L.
DEPTH TO WATER:	<u>- 5.89</u>	FT
REFERENCE ELEVATION:	<u>= 8.36</u>	FT M.S.L.
TEST NAME:	<u>MW-58-65</u>	
LOGGING INTERVAL:	<u>20</u>	MIN
TEST START TIME:	<u>13:37</u>	HRS



LEGEND: DTW - DEPTH TO WATER
 DTB - DEPTH TO BOTTOM OF WELL
 AD - ACTUAL DEPTH OF TRANSDUCER UNDER WATER
 CL - CABLE LENGTH FROM SENSOR TO GROUND SURFACE/ TOP OF CASING

NOTES:
 Difference= -0.371. E-2. New test.

TRANSDUCER INSTALLATION LOG

GZA GEOENVIRONMENTAL OF NEW YORK 440 NINTH AVENUE, 18th FLOOR NEW YORK, NEW YORK 10001 SCIENTISTS AND ENGINEERS	Client	WELL ID	MW-107
	Entergy	SHEET	1 of 1
	Indian Point Energy Center	FILE NO.	01.0017869.91
		PROJECT LOCATION	Indian Point

MANUFACTURER	In-Situ	FINAL BORING DEPTH (FT)	37.90	DATUM	NGVD 29
MAKE	MiniTroll	GROUND ELEVATION (FT)	140.061	DATE	4/22/10
PSI CAPACITY	30	CASING ELEVATION (FT)	142.757		
SERIAL NUMBER		CASING DIAMETER (INCH)	2		

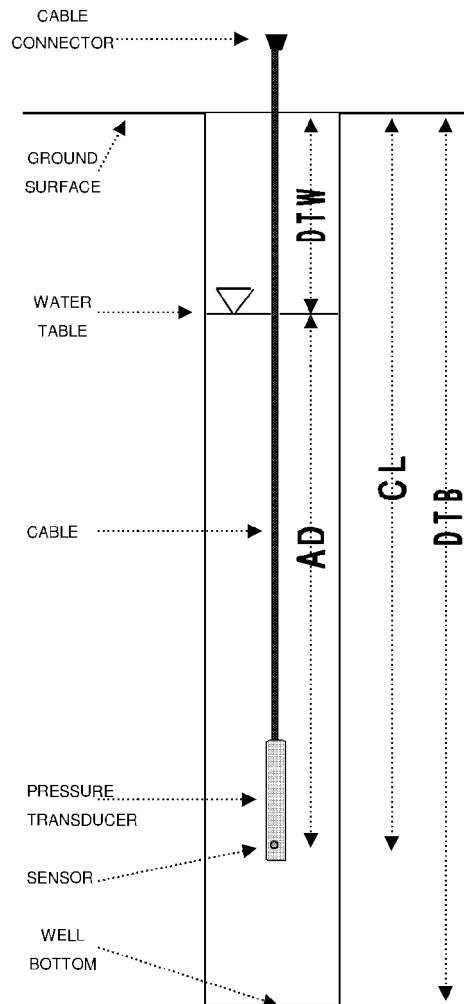
STATIC GROUNDWATER TABLE ELEVATION (FT) 118.31

GZA ENGINEER M. Britos C. Benmergui

ELEVATION OF MEASURING POINT - DEPTH TO WATER = REFERENCE ELEVATION (WATER TABLE ELEVATION)

DEPTH TO WATER + ACTUAL DEPTH = CABLE LENGTH (if transducer is functioning properly)

DEPTH TO BOTTOM:	<u>37.90</u>	FT
GROUND ELEVATION:	<u>140.061</u>	FT M.S.L.
CASING ELEVATION:	<u>142.757</u>	FT M.S.L.
CASING ABOVE (+) OR BELOW (-) GROUND:	above	
DISTANCE FROM CASING TO GROUND (+ OR -):	<u>2.696</u>	FT
MEASURED CABLE LENGTH:	--	FT
TIME OF MEASUREMENT:	<u>08:54</u>	HRS
MEASUREMENT TAKEN FROM:	<u>TOC</u>	
DEPTH TO WATER:	<u>24.45</u>	FT
ACTUAL DEPTH:	+ <u>17.380</u>	FT
THEORETICAL CABLE LENGTH:	= <u>41.830</u>	FT
HAVE CLOCKS BEEN SYNCHRONIZED?	<input checked="" type="checkbox"/>	check
IS TRANSDUCER SET TO TAKE "SURFACE" READINGS?	<input checked="" type="checkbox"/>	check
ELEVATION OF MEASURING POINT:	<u>142.757</u>	FT M.S.L.
DEPTH TO WATER:	- <u>24.45</u>	FT
REFERENCE ELEVATION:	= <u>118.307</u>	FT M.S.L.
TEST NAME:	<u>MW-107</u>	
LOGGING INTERVAL:	<u>20</u>	MIN
TEST START TIME:	<u>08:54</u>	HRS



LEGEND: DTW - DEPTH TO WATER
 DTB - DEPTH TO BOTTOM OF WELL
 AD - ACTUAL DEPTH OF TRANSDUCER UNDER WATER
 CL - CABLE LENGTH FROM SENSOR TO GROUND SURFACE/ TOP OF CASING

NOTES:
 Difference -2.148

TRANSDUCER INSTALLATION LOG

GZA GEOENVIRONMENTAL OF NEW YORK 440 NINTH AVENUE, 18th FLOOR NEW YORK, NEW YORK 10001 SCIENTISTS AND ENGINEERS	Client	WELL ID	OUT-1
	Entergy	SHEET	1 of 1
	Indian Point Energy Center	FILE NO.	01.0017869.91
		PROJECT LOCATION	Indian Point

MANUFACTURER	In-Situ	FINAL BORING DEPTH (FT)	--	DATUM	NGVD 29
MAKE	MiniTroll	GROUND ELEVATION (FT)	8.20	DATE	5/7/2010
PSI CAPACITY	30	CASING ELEVATION (FT)	11.89		
SERIAL NUMBER		CASING DIAMETER (INCH)	2		

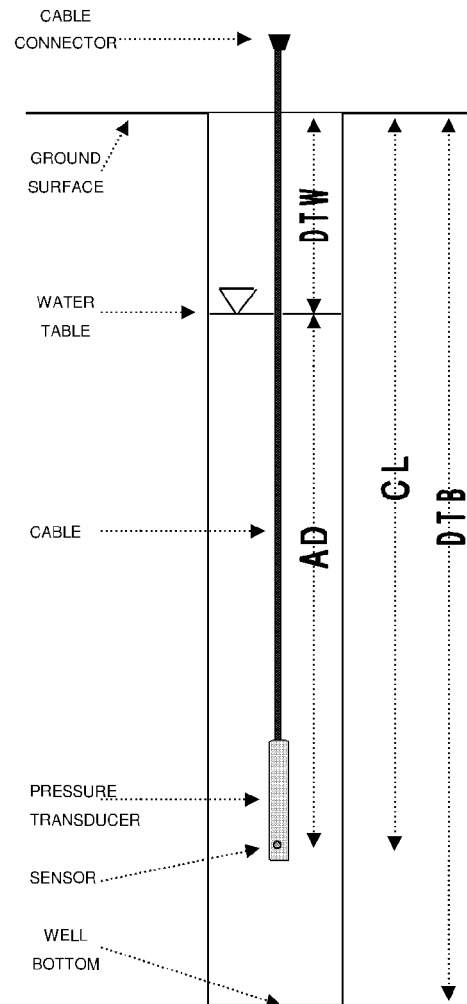
STATIC GROUNDWATER TABLE ELEVATION (FT) 2.96

GZA ENGINEER C. Benmergui

ELEVATION OF MEASURING POINT - DEPTH TO WATER = REFERENCE ELEVATION (WATER TABLE ELEVATION)

DEPTH TO WATER + ACTUAL DEPTH = CABLE LENGTH (if transducer is functioning properly)

DEPTH TO BOTTOM:	--	FT
GROUND ELEVATION:	8.20	FT M.S.L.
CASING ELEVATION:	11.89	FT M.S.L.
CASING ABOVE (+) OR BELOW (-) GROUND:	above	
DISTANCE FROM CASING TO GROUND (+ OR -):	3.69	FT
MEASURED CABLE LENGTH:	--	FT
TIME OF MEASUREMENT:	9:16	HRS
MEASUREMENT TAKEN FROM:	TOC	
DEPTH TO WATER:	8.93	FT
ACTUAL DEPTH:	+ 8.735	FT
THEORETICAL CABLE LENGTH:	= 17.665	FT
HAVE CLOCKS BEEN SYNCHRONIZED?	<input checked="" type="checkbox"/>	check
IS TRANSDUCER SET TO TAKE "SURFACE" READINGS?	<input checked="" type="checkbox"/>	check
ELEVATION OF MEASURING POINT:	11.891	FT M.S.L.
DEPTH TO WATER:	- 8.930	FT
REFERENCE ELEVATION:	= 2.961	FT M.S.L.
TEST NAME:	OUT-1	
LOGGING INTERVAL:	20	MIN
TEST START TIME:	9:16	HRS



LEGEND: DTW - DEPTH TO WATER
 DTB - DEPTH TO BOTTOM OF WELL
 AD - ACTUAL DEPTH OF TRANSDUCER UNDER WATER
 CL - CABLE LENGTH FROM SENSOR TO GROUND SURFACE/ TOP OF CASING

NOTES: Difference -0.712. Replaced batteries (E2), cleaned transducer and cable, reset.

TRANSDUCER INSTALLATION LOG

GZA GEOENVIRONMENTAL OF NEW YORK 440 NINTH AVENUE, 18th FLOOR NEW YORK, NEW YORK 10001 SCIENTISTS AND ENGINEERS	Client	WELL ID	U3-C1
	Entergy	SHEET	1 of 1
	Indian Point Energy Center	FILE NO.	01.0017869.91
		PROJECT LOCATION	Indian Point

MANUFACTURER	In-Situ	FINAL BORING DEPTH (FT)	NA	DATUM	NGVD 29
MAKE	MiniTroll	GROUND ELEVATION (FT)	15.003	DATE	5/25/10
PSI CAPACITY	30	CASING ELEVATION (FT)	18.060		
SERIAL NUMBER	5548	CASING DIAMETER (INCH)	2		

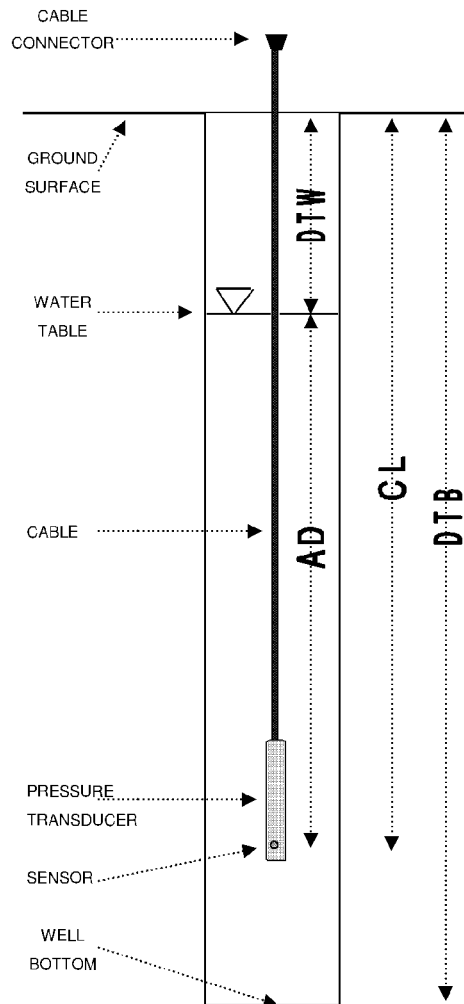
STATIC GROUNDWATER TABLE ELEVATION (FT) 3.16

GZA ENGINEER M. Britos

ELEVATION OF MEASURING POINT - DEPTH TO WATER = REFERENCE ELEVATION (WATER TABLE ELEVATION)

DEPTH TO WATER + ACTUAL DEPTH = CABLE LENGTH (if transducer is functioning properly)

DEPTH TO BOTTOM:	NA	FT
GROUND ELEVATION:	15.003	FT M.S.L.
CASING ELEVATION:	18.060	FT M.S.L.
CASING ABOVE (+) OR BELOW (-) GROUND:	above	
DISTANCE FROM CASING TO GROUND (+ OR -):	3.057	FT
MEASURED CABLE LENGTH:	--	FT
TIME OF MEASUREMENT:		HRS
MEASUREMENT TAKEN FROM:	TOC	
DEPTH TO WATER:	14.90	FT
ACTUAL DEPTH:	+ 9.082	FT
THEORETICAL CABLE LENGTH:	= 23.982	FT
HAVE CLOCKS BEEN SYNCHRONIZED?	<input checked="" type="checkbox"/>	check
IS TRANSDUCER SET TO TAKE "SURFACE" READINGS?	<input checked="" type="checkbox"/>	check
ELEVATION OF MEASURING POINT:	18.060	FT M.S.L.
DEPTH TO WATER:	- 14.90	FT
REFERENCE ELEVATION:	= 3.160	FT M.S.L.
TEST NAME:	U3-C1	
LOGGING INTERVAL:	20	MIN
TEST START TIME:		HRS



LEGEND: DTW - DEPTH TO WATER
 DTB - DEPTH TO BOTTOM OF WELL
 AD - ACTUAL DEPTH OF TRANSDUCER UNDER WATER
 CL - CABLE LENGTH FROM SENSOR TO GROUND SURFACE/ TOP OF CASING

NOTES:
 Troubleshoot "no connection." Replaced connection to cable and batteries. Installed transducer and reset.
 Date on computer ok. Date on transducer 1/1/28.



APPENDIX C: CHAINS OF CUSTODY

Page: 1 of 1
 Project #: Entergy License Renewal Project
 GEL Quote #: GELP07-0628
 COC Number (1):
 PO Number: 50013510

GEL Chain of Custody and Analytical Request

See www.gel.com for GEL's Sample Acceptance SOP

GEL Work Order Number:

GEL Laboratories, LLC
 2040 Savage Road
 Charleston, SC 29407
 Phone: (843) 556-8171
 Fax: (843) 766-1178

Collected by: _____ Phone #: (914) 736-8405

Project Site Name: Indian Point Energy Center Fax #: (914) 734-6247

Address: 450 Broadway, Suite 3, Buchanan, NY 10511

Collected by: Client Send Results To: Patrick Donohue

Sample ID <small>* For composites - indicate start and stop date/time</small>	*Date Collected (mm-dd-yy)	*Time Collected (Military) (hhmm)	QC Code (#)	Field Filtered (#)	Sample Matrix (#)	Should this sample be considered:	Sample Analysis Requested ⁽⁶⁾ (Fill in the number of containers for each test)		Preservative Type (6)	Comments Note: extra sample is required for sample specific QC
							TSCA Regulated	Radioactive		
MW-51-40-(GB01)	4/8/10	1401	N	N	GW	Y	N	1		500 ml Poly
MW-51-79-(GB01)	4/8/10	1427	N	N	GW	Y	N	1		500 ml Poly
MW-51-104-(GB01)	4/8/10	1044	N	N	GW	Y	N	1		500 ml Poly
MW-51-135-(GB01)	4/8/10	1108	N	N	GW	Y	N	1		500 ml Poly
MW-51-163-(GB01)	4/8/10	1142	N	N	GW	Y	N	1		500 ml Poly
MW-51-189-(GB01)	4/8/10	1120	N	N	GW	Y	N	1		500 ml Poly

Total number of containers: Gross Beta

Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4

Sample Collection Time Zone: Eastern Pacific Other Mountain

TAI Requested: Normal: Rush: _____ Specify: _____ Fax Results: Yes / No

Remarks: Are there any known hazards applicable to these samples? If so, please list the hazards

Retiquished By (Signed) _____ Date _____ Time _____

Received by (signed) _____ Date _____ Time _____

GEL PM: Cheryl Daulty

Method of Shipment: FEDEX Date Shipped: _____

Airbill #: _____

Airbill #: _____

Chain of Custody Signatures

Sample Shipping and Delivery Details

For Lab Receiving Use Only
 Custody Seal, intact? YES NO
 Cooler Temp: _____ C

1) Chain of Custody Number = Client Determined
 2) QC Codes: N= Normal Sample, TD = Trip Blank, FD = Field Duplicate, FB = Equipment Blank, MS = Matrix Spike Sample, MSD = Matrix Spike Duplicate Sample, C-Grab, C-Composite
 3) Field Filtered: For liquid matrices, indicate with a Y - for yes the sample was field filtered or N - for sample was not field filtered
 4) Matrix Codes: DW=Drinking Water, GW=Groundwater, SW=Surface Water, WW=Waste Water, MW=Misc Liquid, SO=Soil, SD=Soil, SS=Soil, SF=Soil, O=Oil, F=Filter, P=Pipe, U=Urine, J=Javel, N=Natal
 5) Sample Analysis Requested: Analytical method requested (i.e. 8260B, 6010B, 7470) and number of containers provided for each (i.e. 8260B 3, 6010B 4, 7470 1)
 6) Preservative Type: HA= Hydrochloric Acid, NI = Nitric Acid, SH = Sodium Hydroxide, SA = Sulfuric Acid, AA = Ascorbic Acid, HX = Hexane, ST = Sodium Thiosulfate. If no preservative is added - leave field blank

**WHITE = LABORATORY
 YELLOW = FILE
 PINK = CLIENT**

GEL Chain of Custody and Analytical Request

GEL Laboratories, LLC
2040 Savage Road
Charleston, SC 29407
Phone: (843) 556-8171
Fax: (843) 766-1178

GEL Work Order Number:

Page: 1 of 1
Project #: Entergy GW Mon Prog
GEL Quote #: _____
COC Number: ⁽¹⁾ _____
PO Number: 50013510

Client Name: Entergy Phone #: (914) 736-8405
Project/Site Name: Indian Point Energy Center Fax #: (914) 734-6247
Address: 450 Broadway, Suite 3, Buchanan, NY 10511

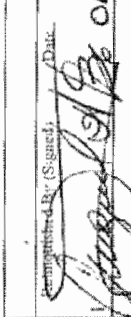
Collected by: M. Britos Send Results To: Patrick Donahue

Sample ID	*Date Collected (mm-dd-yy)	*Time Collected (Military) (hh:mm)	QC Code (2)	Field Filtered (3)	Sample Matrix (4)	Should this sample be considered:		Total number of containers	Sample Analysis Requested (5) (Fill in the number of containers for each test)						Comments	
						Radioactive	TSCA Regulated		Gamma Spec (GS)	Tritium (H3)	Strontium 90 (Sr90)	<-- Preservative Type (6)				
MW-51-40-(015)	04/08/10	1358	N	N	GW	Y	N	1	1	1	1	1	1	1	2 Liter Poly	
MW-51-79-(015)	04/08/10	1421	N	N	GW	Y	N	1	1	1	1	1	1	1	2 Liter Poly	
MW-51-104-(013)	04/08/10	1042	N	N	GW	Y	N	1	1	1	1	1	1	1	2 Liter Poly	
MW-51-135-(013)	04/08/10	1106	N	N	GW	Y	N	1	1	1	1	1	1	1	2 Liter Poly	
MW-51-163-(013)	04/08/10	1131	N	N	GW	Y	N	1	1	1	1	1	1	1	2 Liter Poly	
MW-51-189-(013)	04/08/10	1116	N	N	GW	Y	N	1	1	1	1	1	1	1	2 Liter Poly	

IAT Requested: Normal: Rush: _____ Specify: _____ (Subject to Surcharges) Fax Results: Yes / No / _____
Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4

Sample Collection Time Zone: Eastern Pacific Central Other Mountain

Remarks: Are there any known hazards applicable to these samples? If so, please list the hazards

Chain of Custody Signatures		Sample Shipping and Delivery Details	
Completed By (Signed)	Date	GEL PM:	Date Shipped:
	04/12/10 0800	ERIN TRENT	FEDEX
	2	Airbill #:	
	3	Airbill #:	

1) Chain of Custody Number = Client Determined
2) QC Codes: N=Normal Sample, TB= Trip Blank, FD= Field Duplicate, EB= Equipment Blank, MS= Matrix Spike Sample, MSD= Matrix Spike Duplicate Sample, G= Grab, C= Composite
3) Field Filtered: For liquid matrices, indicate with a Y - for yes the sample was field filtered or N - for sample was not field filtered.
4) Matrix Codes: DW= Drinking Water, GW= Groundwater, SW= Surface Water, WW= Waste Water, W=Water, ML= Misc Liquid, SL= Solid Waste, C=Oil, F=Fuel, N=Nasal
5) Sample Analysis Requested: Analytical method requested (i.e. 8260B, 6010B/7470B) and number of containers provided for each (i.e. 8260B - 3, 6010B/7470B - 1)
6) Preservative Type: BA= Hydrobromic Acid, NI= Nitric Acid, SB= Sodium Hydroxide, SA= Sulfuric Acid, AA= Ascorbic Acid, BX= Borax, ST= Sodium Thiosulfate. If no preservative is added = leave field blank
WHITE = LABORATORY
YELLOW = FILE
PINK = CLIENT

For Lab Receiving Use Only
Custody Seal Intact? YES NO
Cooler Temp: C

GEL Chain of Custody and Analytical Request

GEL Laboratories, LLC
2040 Seavage Road
Charleston, SC 29407
Phone: (843) 556-8171
Fax: (843) 766-1178

Project #: Entergy GW Mon Prog
GEL Quote #: _____
COC Number: 50013510
PO Number: _____

Client Name: Entergy Phone #: (914) 736-8405
Project/Site Name: Indian Point Energy Center Fax #: (914) 734-6247
Address: 450 Broadway, Suite 3, Buchanan, NY 10511

Collected by: M. Brito / C. Benmergui Send Results To: Patrick Donahue
Sample ID: _____
* For composites - indicate start and stop date/time

Sample ID	*Date Collected (mm-dd-yy)	*Time Collected (Military) (hh:mm)	QC Code (m)	Yield Filtered (N)	Sample Matrix (M)	Should the sample be considered:		Total number of containers	Sample Analysis Requested (5) (Fill in the number of containers for each test)						Comments
						Radioactive	TSCA Regulated		Strontium 90 (Sr90)	Gamma Spec (GS)	Tritium (H3)	Preservative Type (6)			
MW-62-18-(013)	04/13/10	1517	N	N	GW	Y	N	1	1	1	1	1	1	2 Liter Poly	
MW-62-37-(013)	04/13/10	1522	N	N	GW	Y	N	1	1	1	1	1	1	2 Liter Poly	
MW-62-53-(012)	04/13/10	1527	N	N	GW	Y	N	1	1	1	1	1	1	2 Liter Poly	
MW-62-71-(013)	04/13/10	1345	N	N	GW	Y	N	1	1	1	1	1	1	2 Liter Poly	
MW-62-92-(013)	04/13/10	1338	N	N	GW	Y	N	1	1	1	1	1	1	2 Liter Poly	
MW-62-138-(013)	04/13/10	1802	N	N	GW	Y	N	1	1	1	1	1	1	2 Liter Poly	
MW-62-182-(013)	04/13/10	1818	N	N	GW	Y	N	1	1	1	1	1	1	2 Liter Poly	

TAT Requested: Normal. Rush. Specify: _____ Fax Results: Yes / No
 Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4
 Sample Collection Time Zone: Eastern Pacific Other _____
 Mountaintain _____

Remarks: **Are there any known hazards applicable to these samples? If so, please list the hazards**
 Chain of Custody Signatures
 Received by (signed) Date Time
C. Benmergui 4/14/10 1650 1 SECURE STORAGE 4/14/10 1650
 2
 3

Retrieved By (S good): _____ Date Time
 GEL PM: ERIN TRENT
 Method of Shipment: FEDEX Date Shipped: _____
 Airbill #: _____
 Airbill #: _____

For Lab Receiving Use Only
 Custody Seal Intact? YES NO
 Cooler Temp: C

1) Chain of Custody Number = Client Determined
 2) QC Codes: N=Normal Sample, TB= Trip Blank, FD= Field Duplicate, EB= Equipment Blank, MS= Matrix Spike Sample, MSD= Matrix Spike Duplicate Sample, Q= Grab, C= Composite
 3) Field Filtered: For liquid matrices, indicate with a Y - for yes the sample was field filtered or N - for sample was not field filtered.
 4) Matrix Codes: BW=Drinking Water, GW=Groundwater, SW=Surface Water, WW=Waste Water, W=Water, ML=Mac Liquid, SO=Soil, SD=Sediment, SL=Sludge, S9=Solid Waste, O=Oil, F=Filter, U=Urine, F=Faecal, N=Nasal
 5) Sample Analysis Requested: Analytical method requested (i.e. 8260B, 6010B/7570) and number of containers provided for each (i.e. 956B-3, 6010B/7570-1)
 6) Preservative Type: HA= Hydrochloric Acid, NI= Nitric Acid, SE= Sodium Hydroxide, SA= Sulfuric Acid, AA= Ascorbic Acid, EX= Hexane, ST= Sodium Thiosulfate. If no preservative is added = leave field blank
 WHITE = LABORATORY YELLOW = FILE PINK = CLIENT

GEL Chain of Custody and Analytical Request

GEL Laboratories, LLC
2040 Savage Road
Charleston, SC 29407
Phone: (843) 556-8171
Fax: (843) 766-1178

See www.gel.com for GEL's Sample Acceptance SOP

GEL Work Order Number: 50013510

Sample Analysis Requested ⁽⁶⁾ (Fill in the number of containers for each test)

Phone #: (914) 736-8405

Fax #: (914) 734-6247

Project/Site Name: Indian Point Energy Center

Address: 450 Broadway, Suite 3, Buchanan, NY 10511

Collected by: Client

Send Results To: Patrick Donahue

Sample ID <small>* For composites - indicate start and stop date/time</small>	*Date Collected (mm-dd-yy)	*Time Collected (Military) (hhmm)	QC Code (2)	Field Filtered (3)	Sample Matrix (4)	Should this sample be considered:	Total number of containers						Comments Note: extra sample is required for sample specific QC
							Radioactive	TSCA Regulated	Gross Beta	Preservative Type (6)			
MW-62-18-(GB01)	4/13/10	1517	N	N	GW	Y	N	1	1				500 ml Poly
MW-62-37-(GB01)	4/13/10	1522	N	N	GW	Y	N	1	1				500 ml Poly
MW-62-53-(GB01)	4/13/10	1527	N	N	GW	Y	N	1	1				500 ml Poly
MW-62-71-(GB01)	4/13/10	1345	N	N	GW	Y	N	1	1				500 ml Poly
MW-62-92-(GB01)	4/13/10	1338	N	N	GW	Y	N	1	1				500 ml Poly
MW-62-138-(GB01)	4/13/10	1802	N	N	GW	Y	N	1	1				500 ml Poly
MW-62-182-(GB01)	4/13/10	1818	N	N	GW	Y	N	1	1				500 ml Poly

TAT Requested: Normal: Rush: Specify: (Subject to Surcharge) Fax Results: Yes / No

Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4

Sample Collection Time Zone: Eastern Pacific Central Mountain

Remarks: Are there any known hazards applicable to these samples? If so, please list the hazards

Chain of Custody Signatures

Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
<i>Cheryl Duffy</i>	4/14/10	1050	<i>Cheryl Duffy</i>	4/14/10	1650

GEL PM: Cheryl Duffy

Method of Shipment: FEDEX

Date Shipped:

Airbill #: _____

Airbill #: _____

For Lab Receiving Use Only

Custody Seal Intact? YES / NO

Cooler Temp: _____

1) Chain of Custody Number - Client Determined
 2) QC Codes: N= Normal Sample, FB= Trip Blank, FD= Field Duplicate, EB= Equipment Blank, MS= Matrix Spike Sample, MSD= Matrix Spike Duplicate Sample, G= Grab, C= Composite
 3) Field Filtered: For liquid matrices, indicate with a Y - for yes the sample was field filtered or N - for sample was not field filtered
 4) Matrix Codes: DW=Drinking Water, GW=Groundwater, SW=Surface Water, WW=Waste Water, W=Water, ML=Misc. Liquid, SO=Soil, SD=Soil, S=Sludge, SS=Solid Waste, O=Oil, F=Filter, P=Wipe, U=Urine, F=Fecal, N=Nasal
 5) Sample Analysis Requested: Analytical method requested (i.e. 8060B, 6010B, 7470) and number of containers provided for each (i.e. 8100B-3, 6010B/7470A-1)
 6) Preservative Type: HA= Hydrochloric Acid, NI= Nitric Acid, SH= Sodium Hydroxide, SA= Sulfuric Acid, AA= Ascorbic Acid, HX= Hexane, ST= Sodium Thiosulfate. If no preservative is added = leave field blank
WHITE = LABORATORY YELLOW = FILE PINK = CLIENT

Page: 1 of 1
 Project #: Energy License Renewal Project
 GEL Quote #: GELP07-0628
 COC Number (1):
 PO Number: 50013510

GEL Laboratories, LLC
 2040 Savage Road
 Charleston, SC 29407
 Phone: (843) 556-8171
 Fax: (843) 766-1178

GEL Chain of Custody and Analytical Request

See www.gel.com for GEL's Sample Acceptance SOP

GEL Work Order Number:

Collected by: _____ Phone #: (914) 736-8405

Project/Site Name: Indian Point Energy Center Fax #: (914) 734-6247

Address: 450 Broadway, Suite 3, Buchanan, NY 10511

Collected by: Client Send Results To: Patrick Donahue

Sample ID	*Date Collected (mm-dd-yy)	*Time Collected (Military) (hh:mm)	QC Code (b)	Field Filtered (c)	Sample Matrix (d)
MW-31-49-(GB01)	4/14/10	1042	N	N	GW
MW-31-63-(GB01)	4/14/10	1305	N	N	GW
MW-31-85-(GB01)	4/14/10	1209	N	N	GW

* For composites - indicate start and stop date/time

Should this sample be considered:	TSCA Required	Radionuclide	Total number of containers	Gross Beta	Preservative Type (6)	Comments
Y	N	Y	1	1	500 ml Poly	Note: extra sample is required for sample specific QC
Y	N	Y	1	1	500 ml Poly	
Y	N	Y	1	1	500 ml Poly	

TAT Requested: Normal Rush: _____ Specify: _____ (Subject to Surcharges) Fax Results: Yes / No Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4

Sample Collection Time Zone: Eastern Pacific Mountain Other _____

Remarks: Are there any known hazards applicable to these samples? If so, please list the hazards

Chain of Custody Signatures

Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
<i>Patrick Donahue</i>	4/14/10	1050	<i>Sheryl Duffly</i>	4/14/10	1050

Method of Shipment: FEDEX Date Shipped: _____

Airbill #: _____

Airbill #: _____

For Lab Receiving Use Only
 Custody Seal Intact? YES NO
 Cooler Temp: _____ C

1) Chain of Custody Number = Client Determined
 2) QC Codes: N = Normal Sample, TB = Trip Blank, EB = Equipment Blank, MS = Matrix Spike Sample, MSD = Matrix Spike Duplicate Sample, G = Grab, C = Composite
 3) Field Filtered: For liquid matrices, indicate with a Y; for yes the sample was field filtered or N - for sample was not field filtered
 4) Matrix Codes: DW=Drinking Water, GW=Groundwater, SW=Surface Water, WW=Waste Water, W=Water, ML=Misc Liquid, SD=Soil, SS=Sludge, NS=Solid Waste, O=Oil, F=Filter, P=Wipe, U=Urine, F=Feal, N=Nasal
 5) Sample Analysis Requested: Analytical method requested (i.e. 8260B, 6010B, 7470A) and number of containers provided for each (i.e. 2/260B-3, 6010B/2/70A-1)
 6) Preservative Type: HA= Hydrochloric Acid, NI = Nitric Acid, SH= Sodium Hydroxide, SA= Sulfuric Acid, AA= Ascorbic Acid, HX= Hexane, ST = Sodium Thiosulfate. If no preservative is added = leave field blank
 WHITE = LABORATORY
 YELLOW = FILE
 PINK = CLIENT

Page: 1 of 1
 Project #: Energy GW Mon Prog
 GEL Quote #: _____
 COC Number: _____
 PO Number: 50013510

GEL Chain of Custody and Analytical Request

See www.gel.com for GEL's Sample Acceptance SOP

GEL Work Order Number:

GEL Laboratories, LLC
 2040 Savage Road
 Charleston, SC 29407
 Phone: (843) 556-8171
 Fax: (843) 766-1178

Client Name: Energy

Phone #: (914) 736-8405

Project/Site Name: Indian Point Energy Center

Fax #: (914) 734-6247

Address: 450 Broadway, Suite 3, Buchanan, NY 10511

Collected by: CB, MB Send Results To: Patrick Donahue

Sample Analysis Requested ⁽⁶⁾ (Fill in the number of containers for each test)

Should this sample be considered:

Radioactive

TSCA Regulated

Total number of containers

Gamma Spec (GS)

Tritium (H3)

Strontium 90 (Sr90)

Preservative Type (6)

Comments

Note: extra sample is required for sample specific QC

2 Liter Poly

2 Liter Poly

2 Liter Poly

2 Liter Poly

2 Liter Poly

2 Liter Poly

2 Liter Poly

2 Liter Poly

2 Liter Poly

2 Liter Poly

TAT Requested: Normal: Rush: _____ Specify: _____ (Subject to Surcharge) Fax Results: Yes / No / _____

Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4

Sample Collection Time Zone

Eastern
 Central
 Mountain
 Pacific
 Other

Chain of Custody Signatures

Received by (signed) _____ Date: _____ Time: _____

1. Carly Ryan 4/16/10 1440

2. _____ 4/16/10 1440

3. _____ 4/16/10 1440

Sample Shipping and Delivery Details

GEL PM: ERIN TRENT

Method of Shipment: FEDEX

Date Shipped: _____

Airbill #: _____

Airbill #: _____

1) Chain of Custody Number = Client Determined
 2) QC Codes: N = Normal Sample, TB = Trip Blank, FD = Field Duplicate, EB = Equipment Blank, MS = Matrix Spike Sample, MSD = Matrix Spike Duplicate Sample, G = Grab, C = Composite
 3) Field Filtered: For liquid matrices, indicate with a Y - for yes the sample was field filtered or N - for sample was not field filtered
 4) Matrix Codes: DW=Drinking Water, GW=Groundwater, SW=Surface Water, WW=Waste Water, W=Water, ML=Misc Liquid, SO=Soil, SP=Sediment, SL=Sludge, SS=Solid Waste, O=Oil, F=Filter, P=Wipe, U=Urine, F=Food, N=Nasal
 5) Sample Analysis Requested: Analytical method requested (i.e. 8260B, 6010B/7470) and number of containers provided for each (i.e. 8260B - 3, 6010B/7470 - 1)
 6) Preservative Type: BA= Hydrochloric Acid, NI= Nitric Acid, SE= Sodium Hydroxide, SA= Sulfuric Acid, AA= Ascorbic Acid, EX= Hexane, ST = Sodium Thiosulfate. If no preservative is added = leave field blank

WHITE = LABORATORY

YELLOW = FILE

PINK = CLIENT

For Lab Receiving Use Only

Custody Seal Intact?

YES NO

Cooler Temp: _____

C

GEL Chain of Custody and Analytical Request

See www.gel.com for GEL's Sample Acceptance SOP

GEL Laboratories, LLC
2040 Savage Road
Charleston, SC 29407
Phone: (843) 556-8171
Fax: (843) 766-1178

GEL Work Order Number:

Phone #: (914) 736-8405

Fax #: (914) 734-6247

Project/Site Name: Indian Point Energy Center

Address: 450 Broadway, Suite 3, Buchanan, NY 10511

Collected by: Client Send Results To: Patrick Donahue

Sample ID	*Date Collected (mm-dd-yy)	*Time Collected (Military) (hh:mm)	QC Code (if Filtered)	Field Filtered	Sample Matrix (if Filtered)	Should this sample be considered:	Total number of containers		Sample Analysis Requested ⁽⁶⁾ (Fill in the number of containers for each test)						Comments Note: extra sample is required for sample specific QC	
							Radionuclide	TSCA Regulated	Preservative Type (6)	Level 1	Level 2	Level 3	Level 4	Level 5		Level 6
MW-40-27-(GB01)	04/15/10	1600	N	N	GW	Y	N	1	1							500 ml Poly
MW-40-46-(GB01)	04/15/10	1618	N	N	GW	Y	N	1	1							500 ml Poly
MW-40-81-(GB01)	04/15/10	1215	N	N	GW	Y	N	1	1							500 ml Poly
MW-40-100-(GB01)	04/15/10	1216	N	N	GW	Y	N	1	1							500 ml Poly
MW-40-127-(GB01)	04/15/10	1313	N	N	GW	Y	N	1	1							500 ml Poly
MW-40-162-(GB01)	04/15/10	1450	N	N	GW	Y	N	1	1							500 ml Poly

TAT Requested Normal: Rush _____ Specify: _____ Fax Results: Yes / No / _____ Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4

Sample Collection Time Zone: Eastern / Pacific / Central / Mountain

Remarks: Are there any known hazards applicable to these samples? If so, please list the hazards

Chain of Custody Signatures		
Relinquished By (Signed)	Date	Time
<i>Cheryl Duffy</i>	4/16/10	1440
	2	
	3	

Received by (signed) _____ Date _____ Time _____

GEL PM: Cheryl Duffy Method of Shipment: FEDEX Date Shipped: _____

Airbill #: _____

For Lab Receiving Use Only
Custody Seal intact? YES / NO
Cooler Temp: C

1) Chain of Custody Number = Client Determined
2) QC Codes: N=Normal Sample, TB=Trip Blank, FD=Field Duplicate, EB=Equipment Blank, MS=Matrix Spike Sample, MSD=Matrix Spike Duplicate Sample, G=Grab, C=Composite
3) Field Filtered: For liquid matrices, indicate with a Y for yes the sample was field filtered or N for no sample was not field filtered
4) Matrix Codes: DW=Drinking Water, GW=Groundwater, SW=Surface Water, WW=Waste Water, W=Water, ML=Misc Liquid, SO=Soil, SS=Sediment, SL=Sludge, SS=Solid Waste, G=Oil, F=Filter, P=Wipe, U=Urine, T=Food, N=Nasal
5) Sample Analysis Requested: Analytical method requested (i.e. 6260B, 5010B, 7472) and number of containers provided for each (i.e. 8260B-3, 6010B/7472-1)
6) Preservative Type: HA=Hydrochloric Acid, NI=Nitric Acid, SH=Sulfuric Acid, SA=Sulfuric Acid, AA=Ascorbic Acid, BX=Hexane, ST=Sodium Thiosulfate. If no preservative is added = leave field blank
WHITE = LABORATORY YELLOW = FILE PINK = CLIENT



New York State Department of Environmental Conservation
625 Broadway
Albany, New York 12233-0001

CHAIN OF CUSTODY

Client: New York State Department of Environmental Conservation				Analysis / Method																								
Project: Energy- Indian Point Ground Water Monitoring																												
Sampled by: Britos, Miguel																												
Client Contact: Tim Rice (NYSDEC) Phone: (518) 402-8574																												
Sample Description:																												
Sample Location	Date Completed	Time Completed	Sample Matrix	Composite or Grab	No. of Containers	Gross Alpha	Gross Beta	Ni-59	Ni-63	Fe-55	Gamma	Tritium	I-129	P-32	C-14	Am-241	Np-237	Nb-94	Pu-238, 239/240	Pu-241	Ra-224, 228	Sr-89/90	Tc-99	U-234, 235, 238	Th-230, 232	Cs-137	Other	
MW-40-27-(011)	04/15/10	1600	GW	Grab	1						X	X										X						
MW-40-46-(012)	04/15/10	1618	GW	Grab	1						X	X										X						
MW-40-81-(012)	04/15/10	1215	GW	Grab	1						X	X										X						
MW-40-100-(014)	04/15/10	1216	GW	Grab	1						X	X										X						
MW-40-127-(014)	04/15/10	1313	GW	Grab	1						X	X										X						
MW-40-162-(012)	04/15/10	1450	GW	Grab	1						X	X										X						
Relinquished by: <i>[Signature]</i>				Date: 04/15/10 Time: 1626 Received by: <i>[Signature]</i> Date: 4/15/10 Time: 1626																								
Relinquished by:				Date: Time: Received by: Date: Time:																								
Relinquished by:				Date: Time: Received by: Date: Time:																								
Shipment Method:				AirBill Number:																								

Turnaround Time Required: _____

Routine: _____

Rush: _____

Cooler Temp: _____

Comments: This is a split sample observed by the NYSDEC

Page: 1 of 1
 Project #: Entergy_GW Mon Prog
 GEL Quote #:
 COC Number (6):
 PO Number: 50013510

GEL Laboratories, LLC
 2040 Savage Road
 Charleston, SC 29407
 Phone: (843) 556-8171
 Fax: (843) 766-1178

GEL Chain of Custody and Analytical Request

** See www.gel.com for GEL's Sample Acceptance SOP**

GEL Work Order Number:

Client Name: Entergy
 Phone #: (914) 736-8405
 Project/Site Name: Indian Point Energy Center
 Fax #: (914) 734-8247
 Address: 450 Broadway, Suite 3, Buchanan, NY 10511

Collected by: M. Britos
 Send Results To: Patrick Donahue

Sample ID	*Date Collected (mm-dd-yy)	*Time Collected (Military) (hh:mm)	QC Code (1)	Field Filtered (2)	Sample Matrix (3)	Should this sample be considered:		Total number of containers	Sample Analysis Requested (6) (Fill in the number of containers for each test)	<-- Preservative Type (6)	Comments
						Radioactive	TSCA Regulated				
MW-42-49-(021)	4/10/10	1259	N	N	GW	Y	N	1	Gamma Spec (GS)		Note: extra sample is required for sample specific QC
MW-42-78-(016)	4/10/10	1329	N	N	GW	Y	N	1	Tritium (H3)		2 Liter Poly
									Strontium 90 (Sr90)		2 Liter Poly
									Nickel 63 (Ni63)		

TAT Requested: Normal: Rush: Specify: (Subject to Surcharges) Fax Results: Yes / No
 Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4
 Sample Collection Time Zone: Eastern Pacific Other: Mountain

Remarks: Are there any known hazards applicable to these samples? If so, please list the hazards

Chain of Custody Signatures			Sample Shipping and Delivery Details		
Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
Carla Bygini	4/10/10	1440	ERIN TRENT	4/10/10	1440

Method of Shipment: FEDEX
 Date Shipped:
 Airbill #:
 Airbill #:

For Lab Receiving Use Only
 Custody Seal Intact?
 YES NO
 Cooler Temp:
 C

Chain of Custody Number = Client Determined
 1) QC Codes: N = Normal Sample, TB = Trip Blank, FD = Field Duplicate, EB = Equipment Blank, MS = Matrix Spike Sample, MSD = Matrix Spike Duplicate Sample, G = Grab, C = Composite
 2) Field Filtered: For liquid matrices, indicate with a Y - for yes the sample was field filtered or N - for no sample was not field filtered
 3) Matrix Codes: DW=Drinking Water, GW=Groundwater, SW=Surface Water, WW=Waste Water, MW=Misc Liquid, SD=Soil, SD-Sol, SD-Sludge, SS=Solid Waste, OXI, F=Filter, F=Filter, F=Filter, F=Filter, F=Filter, F=Filter
 4) Sample Analysis Requested: Analytical method requested (i.e. 8260B, 8010B/7470) and number of containers provided for each (i.e. 8260B-3, 8210B/7470-1)
 5) Preservative Type: HA= Hydrochloric Acid, NI = Nitric Acid, SF= Sodium Hydroxide, SA= Sulfuric Acid, AA= Ascorbic Acid, DX= Hexane, ST= Sodium Thiosulfate. If no preservative is added = leave field blank
 WHITE = LABORATORY
 YELLOW = FILE
 PINK = CLIENT

GEL Chain of Custody and Analytical Request

See www.gel.com for GEL's Sample Acceptance SOP

GEL Laboratories, LLC
2040 Savage Road
Charleston, SC 29407
Phone: (843) 556-8171
Fax: (843) 766-1178

GEL Work Order Number:

Phone #: (914) 736-8405

Fax #: (914) 734-6247

Project/Site Name: Indian Point Energy Center

Address: 450 Broadway, Suite 3, Buchanan, NY 10511

Collected by Client

Send Results To: Patrick Donahue

Sample ID

* For composites - indicate start and stop date/time

B-1-(GB01)

*Date Collected (mm-dd-yy) 04/23/10 16:44

*Time Collected (Military) (hh:mm)

QC Code (3)

N

Field Filtered (1)

N

Sample Matrix (4)

GW

Should this sample be considered:

Radioactive

Y

TSCA Regulated

N

Total number of containers

1

Gross Beta

1

Comments

Note: extra sample is required for sample specific QC

500 ml Poly

<-- Preservative Type (6)

Sample Analysis Requested (8) (Fill in the number of containers for each test)

Level 1 / Level 2 / Level 3 / Level 4

Circle Deliverable: C of A / QC Summary

Sample Collection Time Zone

Eastern Pacific

Central Other

Mountain

Method of Shipment: FEDEX

Date Shipped:

GEL PM: Cheryl Duffy

Airbill #:

Airbill #:

For Lab Receiving Use Only

Custody Seal Intact?

YES NO

Cooler Temp:

C

Chain of Custody Signatures

Received by (Signed) Date Time

1 Cheryl Duffy 4/23/10 15:45

2

3

1) Chain of Custody Number = Client Determined

2) QC Codes: N = Normal Sample, TB = Trip Blank, FD = Field Duplicate, EB = Equipment Blank, MS = Matrix Spike Sample, MSD = Matrix Spike Duplicate Sample, G = Grab, C = Composite

3) Field Filtered: For liquid matrices, indicate with a Y - for yes the sample was field filtered or N - for no sample was not field filtered.

4) Matrix Code: DW = Drinking Water, GW = Groundwater, SW = Surface Water, WW = Waste Water, W = Water, ML = Misc. Liquid, SO = Soil, SD = Sediment, SL = Sludge, SS = Solid Waste, O = Oil, P = Filter, P = Wipe, U = Urine, F = Fecal, N = Nasal

5) Sample Analysis Requested: Analytical method requested (i.e. 8260B, 6010B, 7470B) and number of containers provided for each (i.e. 8260B-3, 6010B/7470B-1).

6) Preservative Type: HA = Hydrochloric Acid, NI = Nitric Acid, SH = Sodium Hydroxide, SA = Sulfuric Acid, AX = Acetic Acid, HX = Hexane, ST = Sodium Thiosulfate. If no preservative is added = have field blank

WHITE = LABORATORY

YELLOW = FILE

PINK = CLIENT

GEL Chain of Custody and Analytical Request

See www.gel.com for GEL's Sample Acceptance SOP

GEL Laboratories, LLC
2040 Savage Road
Charleston, SC 29407
Phone: (843) 556-8171
Fax: (843) 766-1178

GEL Work Order Number:

Phone #: (914) 736-8405
Fax #: (914) 734-6247

Sample Analysis Requested ⁽⁵⁾ (Fill in the number of containers for each test)

Project/Site Name: Indian Point Energy Center

Address: 450 Broadway, Suite 3, Buchanan, NY 10511

Collected by: Client Send Results To: Patrick Donahue

Sample ID <small>* For composites - indicate start and stop date/time</small>	*Date Collected (mm dd yy)	*Time Collected (Military) (hhmm)	QC Code (#)	Field Filtered (#)	Sample Matrix (#)	Should this sample be considered:		Total number of containers	Gross Beta	Comments
						Radioactive	TSCA Regulated			
MW-63-18-(GB01)	4/26/10	1322	N	N	GW	Y	N	1	1	500 ml Poly
MW-63-34-(GB01)	4/26/10	1321	N	N	GW	Y	N	1	1	500 ml Poly
MW-63-50-(GB01)	4/26/10	1206	N	N	GW	Y	N	1	1	500 ml Poly
MW-63-93-(GB01)	4/26/10	1242	N	N	GW	Y	N	1	1	500 ml Poly
MW-63-112-(GB01)	4/26/10	1239	N	N	GW	Y	N	1	1	500 ml Poly
MW-63-121-(GB01)	4/26/10	1259	N	N	GW	Y	N	1	1	500 ml Poly
MW-63-163-(GB01)	4/26/10	1430	N	N	GW	Y	N	1	1	500 ml Poly
MW-63-174-(GB01)	4/26/10	1428	N	N	GW	Y	N	1	1	500 ml Poly

TAT Requested: Normal: Rush: Specify: (Subject to Surcharges) Fax Results: Yes / No
 Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4

Sample Collection Time Zone: Eastern Pacific Other

Remarks: Are there any known hazards applicable to these samples? If so, please list the hazards

Chain of Custody Signatures

Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
<i>eng B. gy</i>	4/26/10	1545			

GEL PM: Cheryl Duffy

Method of Shipment: FEDEX Date Shipped:

Airbill #: Airbill #:

1) Chain of Custody Number = Client Determined 2) QC Code: N=Normal Sample, EB= Trip Blank, FB= Field Duplicate, ER= Equipment Blank, MS= Matrix Spike Sample, MSD= Matrix Spike Duplicate Sample, G= Grab, C= Composite 3) Field Filter: For liquid matrices, indicate with a Y - for yes the sample was field filtered, or N - for sample was not field filtered 4) Matrix Codes: DW= Drinking Water, GW= Groundwater, SW= Surface Water, WW= Waste Water, W= Water, ML= Misc Liquid, SO= Soil, SD= Sediment, SL= Sludge, SS= Solid Waste, D= Oil, F= Filter, P= Pail, U= Urine, F= Fecal, N= Nasal 5) Sample Analysis Requested: Analytical method requested (i.e. 8260B, 6010B, 7070B) and number of containers provided for each (i.e. 8260B, 3, 6010B/2404 - 1) 6) Preservative Type: H= Hydrochloric Acid, N= Nitric Acid, SH= Sodium Hydroxide, SA= Sulfuric Acid, AA= Ascorbic Acid, HX= Hexane, ST= Sodium Thiosulfate, if no preservative is added = leave field blank	
For Lab Receiving Use Only Custody Seal Intact? YES NO Cooler Temp: C	

PINK = CLIENT

WHITE = LABORATORY

YELLOW = FILE

GEL Chain of Custody and Analytical Request

GEL Laboratories, LLC
2040 Savage Road
Charleston, SC 29407
Phone: (843) 556-8171
Fax: (843) 766-1178

Project #: Entergy GW Mon Prog
GEL Quote #:
COC Number: ⁽¹⁾
PO Number: 50013510

GEL Work Order Number:

Client Name: Entergy
Phone #: (914) 736-8405
Fax #: (914) 734-6247

Project/Site Name: Indian Point Energy Center

Address: 450 Broadway, Suite 3, Buchanan, NY 10511

Collected by: **CB, MB** Send Results To: Patrick Donahue

Sample Analysis Requested ⁽⁶⁾ (Fill in the number of containers for each test)

Sample ID	*Date Collected (mm-dd-yy)	*Time Collected (Military (hhmm))	QC Code (N)	Field Filtered (N)	Sample Matrix (G)	Should this sample be considered:		Total number of containers	Tritium (H3)	Gamma Spec (GS)	Strontium 90 (Sr90)	Preservative Type (6)	Comments Note: extra sample is required for sample specific QC
						Radionuclide	TSCA Regulated						
MW-63-18-(013)	4/26/10	1322	N	N	GW	Y	N	1	1	1	1	2 Liter Poly	
MW-63-34-(013)	4/26/10	1321	N	N	GW	Y	N	1	1	1	1	2 Liter Poly	
MW-63-50-(013)	4/26/10	1206	N	N	GW	Y	N	1	1	1	1	2 Liter Poly	
MW-63-93-(014)	4/26/10	1242	N	N	GW	Y	N	1	1	1	1	2 Liter Poly	
MW-63-112-(013)	4/26/10	1239	N	N	GW	Y	N	1	1	1	1	2 Liter Poly	
MW-63-121-(013)	4/26/10	1259	N	N	GW	Y	N	1	1	1	1	2 Liter Poly	
MW-63-163-(013)	4/26/10	1430	N	N	GW	Y	N	1	1	1	1	2 Liter Poly	
MW-63-174-(013)	4/26/10	1428	N	N	GW	Y	N	1	1	1	1	2 Liter Poly	

Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4

Sample Collection Time Zone:
 Eastern
 Pacific
 Central
 Mountain

IAI Requested: Normal: Rush: Specify: (Subject to Surcharges) Fax Results: Yes / No

Remarks: Are there any known hazards applicable to these samples? If so, please list the hazards

Chain of Custody Signatures		Sample Shipping and Delivery Details	
Relinquished By (Signed)	Date	Time	Date
<i>Erin Trent</i>	4/26/10	1545	
			4/26/10 1545

GEL PM: ERIN TRENT
 Method of Shipment: FEDEX
 Date Shipped:
 Airbill #:
 Airbill #:

For Lab Receiving Use Only
 Custody Seal Intact?
 YES NO
 Cooler Temp:
 C

1) Chain of Custody Number = Client Determined
 2) QC Codes N= Normal Sample, TB = Trip Blank, FD= Field Duplicate, EB = Equipment Blank, MS= Matrix Spike Sample, MSD= Matrix Spike Duplicate Sample, G= Grab, C= Composite
 3) Field Filters 1 For liquid matrices, indicate with a Y - for yes the sample was field filtered or N - for sample was not field filtered
 4) Matrix Codes DW=Drinking Water, GW=Groundwater, SW=Surface Water, WW=Waste Water, W=Water, ML=Mac Liquid, SL=Sediment, SS=Sludge, SS=Solid Waste, O=Oil, F=Filler, P=Pipe, U=Urine, F=Fecal, N=Nasal
 5) Sample Analy is Requested: Analytical method requested (i.e. 8260B, 6010B/7470) Hard number of containers provided for each (i.e. 2/200-3, 6010B/74704 - 4)
 6) Preservative Type BA= Hydrochloric Acid, NI = Nitric Acid, SH= Sodium Hydroxide, SA= Sulfuric Acid, AA= Acetic Acid, BX = Hexane, SF = Sodium Thiosulfate, If no preservative is added = have field blank
WHITE = LABORATORY YELLOW = FILE PINK = CLIENT

GEL Chain of Custody and Analytical Request

GEL Laboratories, LLC
2040 Savage Road
Charleston, SC 29407
Phone: (843) 556-8171
Fax: (843) 766-1178

Page: 1 of 1
Project #: Entropy GW Mon Prog
GEL Quote #:
COC Number: 50013510
PO Number:

GEL Work Order Number:

Client Name: Entropy Phone #: (914) 736-8405
Project/Site Name: Indian Point Energy Center Fax #: (914) 734-6247

Address: 450 Broadway, Suite 3, Buchanan, NY 10511

Collected by: M. Britos / C B Send Results To: Patrick Donahue

Sample ID

*For composites - indicate start and stop date/time

Sample ID	*Date Collected (mm-dd-yy)	*Time Collected (Military) (hh:mm)	QC Code (a)	Field Filtered (b)	Sample Matrix (c)	Should this sample be considered:		Sample Analysis Requested (e) (Fill in the number of containers for each test)						Preservative Type (6)	Comments	
						Radonactive	TSCA Regulated	Total number of containers	Tritium (H3)	Gamma Spec (GS)	Strontium 90 (Sr90)	Level 1	Level 2			Level 3
MW-32-149-(017)	04/28/10	1350	N	N	GW	Y	N	1	1	1	1					2 Liter Poly
MW-32-173-(015)	04/28/10	1545	N	N	GW	Y	N	1	1	1	1					2 Liter Poly
MW-32-190-(019)	04/28/10	1551	N	N	GW	Y	N	1	1	1	1					2 Liter Poly
MW-32-48-(006)	04/28/10	1128	N	N	GW	Y	N	1	1	1	1					2 Liter Poly
MW-32-59-(017)	04/28/10	1130	N	N	GW	Y	N	1	1	1	1					2 Liter Poly
MW-32-85-(020)	04/28/10	1308	N	N	GW	Y	N	1	1	1	1					2 Liter Poly

TAT Requested: Normal: Rush: Specify: (Subject to Surcharges) Fax Results: Yes / No Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4

Sample Collection Time Zone: Eastern Pacific Other Mountain

Remarks: Are there any known hazards applicable to these samples? If so, please list the hazards

Chain of Custody Signatures

Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
<i>Erin Trent</i>	4/28/10	1710	<i>Erin Trent</i>	4/28/10	1710

Sample Shipping and Delivery Details

GEL PM: ERIN TRENT
Method of Shipment: FEDEX Date Shipped:
Airbill #: 2
Airbill #: 3

1) Chain of Custody Number = Client Determined
2) QC Codes: N= Normal Sample, TB = Trip Blank, FD = Field Duplicate, EB = Equipment Blank, MS= Matrix Spike Sample, MSD= Matrix Spike Duplicate Samples, G = Grab, C = Composite
3) Field Filtered: For liquid matrices, indicate with a Y - for yes, the sample was field filtered or N - for no, the sample was not field filtered.
4) Matrix Codes: DW= Drinking Water, GW= Groundwater, SW= Surface Water, W= Waste Water, ML= Misc Liquid, SL= Soil, SD= Sediment, SL= Sludge, SS= Solid Waste, O= Oil, F= Filter, P= Pipe, G= Gaseous, L= Liquid, X= Asad
5) Sample Analysis Requested: Analytical method requested (i.e. 8260B, 6010B, 7979) and number of containers provided for each (i.e. 8260B 3, 6010B 1, 7979 1).
6) Preservative Type: BA= Hydrochloric Acid, NI= Nitric Acid, SH= Sodium Hydroxide, SA= Sulfuric Acid, AA= Ascorbic Acid, EX= Hexose, ST = Sodium Thiosulfate. If no preservative is added = leave field blank

WHITE - LABORATORY
YELLOW - FILE
PINK - CLIENT

For Lab Receiving Use Only
Custody Seal Intact?
YES NO
Cooler Temp: C

Page: 1 of 1
 Project #: Entergy License Renewal Project
 GEL Quote #: GEL197-0628
 COC Number: 1
 PO Number: 50013510
GEL Chain of Custody and Analytical Request
 See www.gel.com for GEL's Sample Acceptance SOP
 GEL Work Order Number:
 GEL Laboratories, LLC
 2040 Savage Road
 Charleston, SC 29407
 Phone: (843) 556-8171
 Fax: (843) 766-1178

Collected by: **CB, MB** Phone #: (914) 736-8405
 Project/Site Name: Indian Point Energy Center Fax #: (914) 734-8247
 Address: 450 Broadway, Suite 3, Buchanan, NY 10511

Send Results To: Patrick Donahue

Sample ID	*Date Collected (mm-dd-yy)	*Time Collected (Military) (hh:mm)	QC Code (6)	Field Filtered (6)	Sample Matrix (6)	Should this sample be considered:	Total number of containers	Sample Analysis Requested (6)	Preservative Type (6)	Comments
						Nonreactive				Note: extra sample is required for sample specific QC
MW-32-48-(GB01)	04/28/10	1128	N	N	GW	Y	1	1		500 ml Poly
MW-32-59-(GB01)	04/28/10	1130	N	N	GW	Y	1	1		500 ml Poly
MW-32-85-(GB01)	04/28/10	1308	N	N	GW	Y	1	1		500 ml Poly
MW-32-149-(GB01)	04/28/10	1350	N	N	GW	Y	1	1		500 ml Poly
MW-32-173-(GB01)	04/28/10	1545	N	N	GW	Y	1	1		500 ml Poly
MW-32-190-(GB01)	04/28/10	1551	N	N	GW	Y	1	1		500 ml Poly

TAT Requested: Normal: Rust: Specify: (subject to surcharge) Fax Results: Yes / No
 Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4
 Sample Collection Time Zone: Eastern Pacific Other Mountain

Remarks: Are there any known hazards applicable to these samples? If so, please list the hazards

Chain of Custody Signatures

Requisitioned By (Signed)	Date	Time	Received by (signed)	Date	Time
<i>Cheryl Duffy</i>	4/28/10	1710	Cheryl Duffy	4/28/10	1710

Method of Shipment: FEDEX Date Shipped:
 Airbill #:
 Airbill #:

1) Chain of Custody Number = Client Determined
 2) QC Codes N = Normal Sample, TB = Trip Blank, FD = Field Duplicate, EB = Equipment Blank, MS = Matrix Spike Sample, MSD = Matrix Spike Duplicate Sample, G = Grab, C = Composite
 3) Field Filtered: For liquid matrices, indicate with a Y - for yes the sample was field filtered or N - for sample was not field filtered
 4) Matrix Codes DW = Drinking Water, GW = Groundwater, SW = Surface Water, WW = Waste Water, W = Water, ML = Milk Liquid, SO = Soil, SD = Soil, SF = Solid Waste, O = Oil, F = Filter, P = Wipes, U = Urine, F = Fecal, N = Nails
 5) Sample Analysis Requested: Analytical method requested (i.e. 8560B, 6010B, 7470B) number of containers provided for each (i.e. 2, 200, 3, 6010B, 7470B - 1)
 6) Preservative Type: HA = Hydrochloric Acid, NI = Nitric Acid, SH = Sodium Hydroxide, SA = Sulfuric Acid, AA = Acetic Acid, HX = Hexane, ST = Sodium Thiosulfate. If no preservative is added = leave field blank
 WHITE = LABORATORY YELLOW = FILE PINK = CLIENT
 For Lab Receiving Use Only
 Custody Seal Intact?
 YES NO
 Cooler Temp:
 C

GEL Chain of Custody and Analytical Request

See www.gel.com for GEL's Sample Acceptance SOP

GEL Laboratories, LLC
2040 Savage Road
Charleston, SC 29407
Phone: (843) 556-8171
Fax: (843) 766-1178

GEL Work Order Number:

Phone #: (914) 736-8405
Fax #: (914) 734-6247

Sample Analysis Requested ⁽⁶⁾ (Fill in the number of containers for each test)

Project/Site Name: Indian Point Energy Center
Address: 450 Broadway, Suite 3, Buchanan, NY 10511
Collected by: *CB, MB*

Send Results To: Patrick Donahue

Sample ID <small>* For composites - indicate start and stop date/time</small>	*Date Collected (mm-dd-yy)	*Time Collected (Military (hhmm))	QC Code (uh)	Field Filtered (y)	Sample Matrix (a)	Should this sample be considered:	Total number of containers		Preservative Type (6)	Comments Note: extra sample is required for sample specific QC
							Radonactive	TSCA Regulated		
MW-54-37-(GB01)	5/3/10	1409	N	N	GW	Y	N	1	500 ml Poly	
MW-54-58-(GB01)	5/3/10	1423	N	N	GW	Y	N	1	500 ml Poly	
MW-54-123-(GB01)	5/3/10	1508	N	N	GW	Y	N	1	500 ml Poly	
MW-54-144-(GB01)	5/3/10	1141	N	N	GW	Y	N	1	500 ml Poly	
MW-54-173-(GB01)	5/3/10	1147	N	N	GW	Y	N	1	500 ml Poly	
MW-54-190-(GB01)	5/3/10	1201	N	N	GW	Y	N	1	500 ml Poly	

TAT Requested: Normal Rush: Specify: _____ Fax Results: Yes / No
Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4

Sample Collection Time Zone: Eastern Pacific Central Mountain

Remarks: Are there any known hazards applicable to these samples? If so, please list the hazards

Chain of Custody Signatures		Sample Shipping and Delivery Details	
Relinquished By (Signed)	Date	Received by (Signed)	Date
<i>Patrick Donahue</i>	5/3/10	Cheryl Duffy	5/3/10
		Method of Shipment: FEDEX	Date Shipped:
		Airbill #:	
		Airbill #:	

1) Chain of Custody Name: = Client Determined
 2) QC Codes: N=Normal Sample; TB= Trip Blank; FB= Field Duplicate; EB= Equipment Blank; MS= Matrix Spike Sample; MSD= Matrix Spike Duplicate Sample; G= Grab; C= Composite
 3) Field Filtered: For liquid matrices, indicate with a Y - for yes the sample was field filtered, or N - for sample was not field filtered
 4) Matrix Codes: DW=Drinking Water; GW=Groundwater; SW=Surface Water; WW=Wastewater; W=Water; ML=Misc Liquid; SO=Soil; SD=Sediment; SL=Sludge; SS=Solid Waste; O=Oil; F=Filter; P=Wipe; U=Urine; F=Feal; N=Nasal
 5) Sample Analysis Requested: Analytical method requested (i.e. as203), 00108/74704/number of containers provided for each (i.e. A360B-3, 63198/74704 - 4)
 6) Preservative Type: HA= Hydrochloric Acid; NI= Nitric Acid; SH= Sodium Hydroxide; SA= Sulfuric Acid; AA= Acetic Acid; HX= Hexane; ST= Sodium Thiosulfate; if no preservative is added = leave field blank

WHITE = LABORATORY YELLOW = FILE PINK = CLIENT

For Lab Receiving Use Only
 Custody Seal Intact?
 YES
 Cooler Temp:
 C

GEL Chain of Custody and Analytical Request

GEL Laboratories, LLC
2040 Savage Road
Charleston, SC 29407
Phone: (843) 556-8171
Fax: (843) 766-1178

Project #: Entergy GW Mon Prog
GEL Order #
COC Number: 50013510
PU Number:

See www.gel.com for GEL's Sample Acceptance SOP

GEL Work Order Number:

Client Name: Entergy Phone #: (914) 736-8405
 Project/Site Name: Indian Point Energy Center Fax #: (914) 734-6247
 Address: 450 Broadway, Suite 3, Buchanan, NY 10511
 Collected by: CB, MS Send Results To: Patrick Donahue

Sample ID <small>* For composites - indicate start and stop date/time</small>	*Date Collected (mm-dd-yy)	*Time Collected (Military) (hhmm)	QC Code (#)	Field Filtered ⁽¹⁾	Sample Matrix ⁽²⁾	Should this sample be considered:		Total number of containers	Sample Analysis Requested ⁽³⁾ (Fill in the number of containers for each test)					Comments Note: extra sample is required for sample specific QC
						Radionuclide	TSCA Regulated		Strontium 90 (Sr90)	Gamma Spec (GS)	Tritium (H3)	Nickel 63 (Ni63)	Preservative Type (6)	
MW-54-37-(013)	5/2/10	1409	N	N	GW	Y	N	1	1	1	1	1	1	2 Liter Poly
MW-54-58-(013)	5/3/10	1423	N	N	GW	Y	N	1	1	1	1	1	1	2 Liter Poly
MW-54-123-(013)	5/3/10	1508	N	N	GW	Y	N	1	1	1	1	1	1	2 Liter Poly
MW-54-144-(013)	5/2/10	1141	N	N	GW	Y	N	1	1	1	1	1	1	2 Liter Poly
MW-54-173-(013)	5/3/10	1147	N	N	GW	Y	N	1	1	1	1	1	1	2 Liter Poly
MW-54-190-(013)	5/3/10	1201	N	N	GW	Y	N	1	1	1	1	1	1	2 Liter Poly

IAT Requested: Normal: Rush: _____ Specify: _____ Fax Results: Yes / No / _____
 Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4
 Sample Collection Time Zone: Pacific
 Eastern Central Mountain Other _____

Chain of Custody Signatures
 Received by (Signed) _____ Date _____ Time _____
 1 Erin Trent 5/3/10 1610
 2 _____ 5/3/10 1610
 3 _____

Chain of Custody Signatures: GEL PM: ERIN TRENT
 Method of Shipment: FEDEX Date Shipped: _____
 Airbill #: _____
 Airbill #: _____

1) Chain of Custody Number - Client Determined
 2) QC Codes: N = Normal Sample, TB = Trip Blank, FB = Field Duplicate, EB = Equipment Blank, MS = Matrix Spike Sample, MSD = Matrix Spike Duplicate Sample, G = Grab, C = Composite
 3) Field Filtered: For liquid matrices, indicate with a Y - for yes the sample was field filtered or N - for sample was not field filtered
 4) Matrix Codes: DW=Drinking Water, GW=Groundwater, SW=Surface Water, WW=Wastewater, MW=Misc. Liquid, SO=Soil, SF=Settlement, SL=Sludge, SS=Solid Waste, O=Oil, F=Filter, P=Wax, U=Urine, F=Fecl, N=Nasal
 5) Sample Analysis Requested: Analytical method requested (i.e. 8260B, 6010B, 7470) and number of containers provided for each (i.e. 8260B 3, 6010B/7470 4 - 1)
 6) Preservative Type: HA = Hydrochloric Acid, NI = Nitric Acid, SH = Sodium Hydroxide, SA = Sulfuric Acid, AA = Acetic Acid, BX = Hexane, ST = Sodium Thiosulfate, if no preservative is added = leave field blank

WHITE = LABORATORY YELLOW = FIELD PINK = CLIENT

For Lab Receiving Use Only
 Custody Seal Intact? YES / NO
 Cooler Temp: C

GEL Chain of Custody and Analytical Request

See www.gel.com for GEL's Sample Acceptance SOP

GEL Laboratories, LLC
2040 Savage Road
Charleston, SC 29407
Phone: (843) 556-8171
Fax: (843) 766-1178

GEL Work Order Number:

Client Name: Entergy

Phone #: (914) 736-8405

Sample Analysis Requested (6) (Fill in the number of containers for each test)

Project/Site Name: Indian Point Energy Center

Fax #: (914) 734-6247

<- Preservative Type (6)

Address: 450 Broadway, Suite 3, Buchanan, NY 10511

Collected by: **C6, MB** Send Results To: Patrick Donahue

Sample ID	*Date Collected (mm-dd-yy)	*Time Collected (Military (hhmm))	QC Code (3)	Field Filtered (4)	Sample Matrix (6)	Should this sample be considered:		TSCA Regulated	Total number of containers	Tritium (H3)	Gamma Spec (GS)	Strontium 90 (Sr90)	Comments
						Radiactive	Radionuclide						
MW-39-67-(008)	05/04/10	1523	N	N	GW	Y	N	N	1	1	1	1	2 Liter Poly
MW-39-84-(008)	05/04/10	1532	N	N	GW	Y	N	N	1	1	1	1	2 Liter Poly
MW-39-102-(008)	05/04/10	1527	N	N	GW	Y	N	N	1	1	1	1	2 Liter Poly
MW-39-124-(008)	05/04/10	1232	N	N	GW	Y	N	N	1	1	1	1	2 Liter Poly
MW-39-183-(008)	05/04/10	1251	N	N	GW	Y	N	N	1	1	1	1	2 Liter Poly
MW-39-195-(008)	05/04/10	1314	N	N	GW	Y	N	N	1	1	1	1	2 Liter Poly

TAT Requested: Normal: Rush: Specify: (Subject to Surcharges) Fax Results: Yes / No Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4

Sample Collection Time Zone: Eastern Pacific Other _____

Remarks: Are there any known hazards applicable to these samples? If so, please list the hazards

Chain of Custody Signatures				Sample Shipping and Delivery Details			
Relinquished By (signed)	Date	Time	Received by (signed)	Date	Time	GEL PM:	Method of Shipment:
	05/04/10	1620	SECURED STORAGE	05/04/10	1620	ERIN TRENT	FEDEX

1) Chain of Custody Number = Client Determined
 2) QC Codes: N=Normal Sample, FB=Trip Blank, FP=Field Duplicate, EB=Equipment Blank, MS=Matrix Spike Sample, MSD=Matrix Spike Duplicate Sample, G=Grab, C=Composite
 3) Field Filtered: For liquid matrices, indicate with a Y - for yes the sample was field filtered or N - for sample was not field filtered
 4) Matrix Codes: DW=Drinking Water, GW=Groundwater, SW=Surface Water, W=Waste Water, W-Water, ML=Misc Liquid, SD=Sediment, SL=Sludge, S9=Solid Waste, O=Oil, P=Filter, J=Jugs, U=Urine, F=Food, N=Nasal
 5) Sample Analysis Requested: Analytical method requested (i.e. 8160B, 6010B/7470B) and number of containers provided for each (i.e. 4240B-3, 6010B/7470B-1)
 6) Preservative Type: HA=Hydrochloric Acid, NI=Nitric Acid, SIF=Sodium Hydroxide, SA=Sulfuric Acid, AA=Ascorbic Acid, HX=Hexane, ST=Sodium Thiosulfate, IF=no preservative is added = leave field blank
WHITE = LABORATORY
PINK = CLIENT
YELLOW = FILE

For Lab Receiving Use Only
 Custody Seal Intact? YES NO
 Cooler Temp: C

GEL Chain of Custody and Analytical Request

See www.gel.com for GEL's Sample Acceptance SOP

GEL Work Order Number:

GEL Laboratories, LLC
2040 Savage Road
Charleston, SC 29407
Phone: (843) 556-8171
Fax: (843) 766-1178

Page: 1 of 1 Project #: Energy License Renewal Project GEL Quote #: GEL P07-0628 COC Number (1): PO Number: 50013510	Phone #: (914) 736-8405 Fax #: (914) 734-6247	Sample Analysis Requested ⁽⁶⁾ (Fill in the number of containers for each test)
Project/Site Name: Indian Point Energy Center Address: 450 Broadway, Suite 3, Buchanan, NY 10511 Collected by: Client Send Results To: Patrick Donahue		Total number of containers: _____ Gross Beta: _____
Sample ID * For composites - indicate start and stop date/time		Should this sample be considered: Radioactive: _____ TSCA Regulated: _____
Sample ID MW-39-67-(GB01) MW-39-84-(GB01) MW-39-102-(GB01) MW-39-124-(GB01) MW-39-183-(GB01) MW-39-195-(GB01)	*Date Collected (mm-dd-yy) 05/04/10 1523 05/04/10 1532 05/04/10 1527 05/04/10 1232 05/04/10 1251 05/04/10 1314	*Time Collected (Military) (hhmm) 1523 1532 1527 1232 1251 1314
QC Code N N N N N N	Field Filtered (1) N N N N N N	Sample Matrix (2) GW GW GW GW GW GW
Comments Note: extra sample is required for sample specific QC		Preservative Type (6) 500 ml Poly 500 ml Poly 500 ml Poly 500 ml Poly 500 ml Poly 500 ml Poly

TAT Requested: Normal: Rush: _____ Specify: _____ (Subject to Surcharge) Fax Results: Yes / No

Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4

Sample Collection Time Zone: Eastern Pacific, Central Mountain, Other _____

Remarks: Are there any known hazards applicable to these samples? If so, please list the hazards

Chain of Custody Signatures

Requisitioned By (Signed): _____	Date: 05/04/10	Time: 1620
Received by (Signed): <i>Cheryl Duffy</i>	Date: 05/04/10	Time: 1620

GEL PM: Cheryl Duffy
Method of Shipment: FEDEX
Date Shipped: _____
Airbill #: _____
Airbill #: _____

For Lab Receiving Use Only
Custody Seal Intact? YES / NO
Cooler Temp: C

1) Chain of Custody Number = Client Determined
 2) QC Codes: N= Normal Sample, TB = Trip Blank, FD= Field Duplicate, ED = Equipment Blank, MS= Matrix Spike Sample, MSP= Matrix Spike Duplicate Sample, G= Grab, C= Composite
 3) Field Filtered: For liquid matrices, indicate with a Y - for yes the sample was field filtered or N - for sample was not field filtered
 4) Matrix Codes: DW=Drinking Water, GW=Groundwater, SW=Surface Water, WW=Waste Water, ML=Misc. Liquid, SO=Soil, SD=Sediment, SL=Sludge, SS=Solid Waste, O=Oil, F=Filter, P=Wipe, U=Urine, F=Fecal, N=Nasal
 5) Sample Analysis Requested: Analytical method requested (i.e. 8260B, 6010B, 7470) and number of containers provided for each (i.e. 6260B 3, 6010B/7470 1)
 6) Preservative Type: HA= Hydrochloric Acid, NI = Nitric Acid, SF= Sodium Hydroxide, SA= Sulfuric Acid, AA= Ascorbic Acid, HM= Hexam, ST = Sodium Thiosulfate. If no preservative is added = leave field blank

WHITE = LABORATORY
YELLOW = FILE
PINK = CLIENT

Page: 1 of 1
 Project #: Entergy GW Mon Prog
 GEL Quote #:
 COC Number:
 PO Number: 50013510

GEL Chain of Custody and Analytical Request

See www.gel.com for GEL's Sample Acceptance SOP

GEL Laboratories, LLC
 2040 Savage Road
 Charleston, SC 29407
 Phone: (843) 556-8171
 Fax: (843) 766-1178

GEL Work Order Number:

Client Name: Entergy
 Phone #: (914) 736-8405
 Project/Site Name: Indian Point Energy Center
 Fax #: (914) 734-6247
 Address: 450 Broadway, Suite 3, Buchanan, NY 10511

Sample Analysis Requested (6) (Fill in the number of containers for each test)

Sample ID	*Date Collected (mm-dd-yy)	*Time Collected (Military (hh:mm))	QC Code (1)	Field Filtered (2)	Sample Matrix (3)	Should this sample be considered?	TSCA Regulated	Radiactive	Total number of containers	Sample Analysis Requested (6)						Preservative Type (6)	Comments Note: extra sample is required for sample specific QC
										Tritium (H3)	Gamma Spec (GS)	Strontium 90 (Sr90)					
MW-52-11-(005)	5/5/10	1224	N	N	GW	Y	N	Y	1	1	1	1	1	1	1	2 Liter Poly	
MW-52-18-(005)	05/05/10	1619	N	N	GW	Y	N	Y	1	1	1	1	1	1	1	2 Liter Poly	
MW-52-48-(005)	05/05/10	1643	N	N	GW	Y	N	Y	1	1	1	1	1	1	1	2 Liter Poly	
MW-52-64-(005)	05/07/10	1252	N	N	GW	Y	N	Y	1	1	1	1	1	1	1	2 Liter Poly	
MW-52-122-(005)	05/05/10	1457	N	N	GW	Y	N	Y	1	1	1	1	1	1	1	2 Liter Poly	
MW-52-162-(005)	05/05/10	1239	N	N	GW	Y	N	Y	1	1	1	1	1	1	1	2 Liter Poly	
MW-52-181-(005)	05/05/10	1247	N	N	GW	Y	N	Y	1	1	1	1	1	1	1	2 Liter Poly	

Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4

Sample Collection Time Zone
 Eastern
 Central
 Mountain
 Pacific
 Other

Sample Shipping and Delivery Details

GEL PM: ERIN TRENT
 Method of Shipment: FEDEX
 Date Shipped:
 Airbill #:
 Airbill #:

For Lab Receiving Use Only
 Custody Seal Intact?
 YES NO
 Cooler Temp:
 C

Chain of Custody Signatures

Received by (Signed)	Date	Time
<i>[Signature]</i>	05/07/10	1475
<i>[Signature]</i>	05/07/10	1475
<i>[Signature]</i>	05/07/10	1425

Remarks: Are there any known hazards applicable to these samples? If so, please list the hazards

- 1) Chain of Custody Number = Client Determined
- 2) QC Codes: N=Normal Sample, TR= Trip Blank, FD= Field Duplicate, EB= Equipment Blank, MS= Matrix Spike Sample, MSD= Matrix Spike Duplicate Sample, G= Grab, C= Composite
- 3) Field Filtered: For liquid matrices, indicate with a 1 - for yes the sample was field filtered or N - for sample was not field filtered.
- 4) Matrix Codes: DW=Drinking Water, GW=Groundwater, SW=Surface Water, W=Water, ML=Misc Liquid, SO=Soil, SS=Solid Waste, O=Oil, F=Filter, P=Wipe, U=Urine, F=Feet, N=Nail
- 5) Sample Analysis Requested: Analytical method requested (1 = 8260B, 6010B, 7470B number of containers provided for each (1 = 8260B, 3, 6010B, 7470B - 1).
- 6) Preservative Type: HA= Hydrochloric Acid, NI= Nitric Acid, SH= Sulfuric Acid, AA= Acetic Acid, RX= Receive, ST = Sodium Thiosulfate, if no preservative is added - leave field blank

WHITE = LABORATORY
 YELLOW = FILE
 PINK = CLIENT

GEL Chain of Custody and Analytical Request

See www.gel.com for GEL's Sample Acceptance SOP

GEL Work Order Number:

Page 1 of 1
 Project #: Energy License Renewal Project
 GEL Quote #: GEL 07-0928
 COC Number: 50013510
 PO Number: 50013510

GEL Laboratories, LLC
 2040 Savage Road
 Charleston, SC 29407
 Phone: (843) 556-8171
 Fax: (843) 766-1178

Collected by: **CB, MB** Phone #: (914) 736-8405
 Project/Site Name: Indian Point Energy Center Fax #: (914) 734-6247
 Address: 450 Broadway, Suite 3, Buchanan, NY 10511

Send Results To: Patrick Donahue

Sample ID <small>* For composites indicate start and stop date/time</small>	Date Collected (mm-dd-yy)	Time Collected (Military (hhmm))	QC Code (?)	Field Filtered (?)	Sample Matrix (#)	Should this sample be considered:		Total number of containers	Sample Analysis Requested ⁽⁶⁾ (Fill in the number of containers for each test)	Preservative Type (6)	Comments Note: extra sample is required for sample specific QC
						Radonactive	TSCA Regulated				
MW-52-11-(GB01)	05/05/10	1220	N	N	GW	Y	N	1	1	500 ml Poly	
MW-52-18-(GB01)	05/05/10	1619	N	N	GW	Y	N	1	1	500 ml Poly	
MW-52-48-(GB01)	05/05/10	1643	N	N	GW	Y	N	1	1	500 ml Poly	
MW-52-64-(GB01)	05/07/10	1252	N	N	GW	Y	N	1	1	500 ml Poly	
MW-52-122-(GB01)	05/05/10	1457	N	N	GW	Y	N	1	1	500 ml Poly	
MW-52-162-(GB01)	05/05/10	1239	N	N	GW	Y	N	1	1	500 ml Poly	
MW-52-181-(GB01)	05/05/10	1247	N	N	GW	Y	N	1	1	500 ml Poly	

TAT Requested: Normal: Rush: Specify: _____ Fax Results: Yes / No
 Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4

Remarks: Are there any known hazards applicable to these samples? If so, please list the hazards

Sample Collection Time Zone: Eastern Pacific / Central Other / Mountain

Chain of Custody Signatures

Received by (signed)	Date	Time
<i>[Signature]</i>	05/07/10	1425
SECURED STORAGE	05/07/10	1425
2		
3		

GEL PM: Cheryl Duffy
 Method of Shipment: FEDEX
 Date Shipped: _____
 Airbill #: _____
 Airbill #: _____

For Lab Receiving Use Only
 Custody Seal Intact? YES / NO
 Cooler Temp: C

1) Chain of Custody Number = Chest Decontaminated
 2) QC Codes: N = Normal Sample, FB = Trip Blank, FD = Field Duplicate, EN = Equipment Blank, MS = Matrix Spike Sample, MSD = Matrix Spike Duplicate Sample, G = Grab, C = Composite
 3) Field Filtered: For liquid matrices, indicates with a Y - for yes the sample was field filtered or N - for no the sample was not field filtered
 4) Matrix Codes: DW = Drinking Water, GW = Groundwater, SW = Surface Water, WW = Waste Water, W = Water, ML = Mixed Liquid, SD = Soil, SF = Solid Waste, P = Filter, F = Filter, U = Urine, F = Fecal, N = Nasal
 5) Sample Analysis Requested: Analytical method requested (i.e. 3350B, 6010B, 7070) and number of containers provided for each (i.e. 3350B-3, 6010B/7070-1)
 6) Preservative type: HA = Hydrochloric Acid, NI = Nitric Acid, SF = Sulfuric Acid, AA = Ascorbic Acid, HX = Hexane, ST = Sodium Thiosulfate. If no preservative is added = leave field blank
 WHITE = LABORATORY
 YELLOW = FILE
 PINK = CLIENT

GEL Chain of Custody and Analytical Request

See www.gel.com for GEL's Sample Acceptance SOP

GEL Laboratories, LLC
2040 Savage Road
Charleston, SC 29407
Phone: (843) 556-8171
Fax: (843) 766-1178

GEL Work Order Number:

Collected by: **M. Ontos**

Phone #: (914) 736-8405

Sample Analysis Requested (9) (Fill in the number of containers for each test)

Project/Site Name: Indian Point Energy Center

Fax #: (914) 734-6247

Address: 450 Broadway, Suite 3, Buchanan, NY 10511

Collected by: Client

Send Results To: Patrick Donahue

Sample ID <small>* For composites - indicate start and stop date/time</small>	Date Collected (mm-dd-yy)	Time Collected (Military (hh:mm))	QC Code (9)	Field Filtered (4)	Sample Matrix (5)	Should this sample be considered:		Total number of containers	Comments
						Hazardous	TSCA Regulated		
MW-67-39-(GB01)	05/06/10	1538	N	N	GW	Y	N	1	500 ml Poly
MW-67-105-(GB01)	05/06/10	1546	N	N	GW	Y	N	1	500 ml Poly
MW-67-173-(GB01)	05/06/10	1603	N	N	GW	Y	N	1	500 ml Poly
MW-67-219-(GB01)	05/06/10	1151	N	N	GW	Y	N	1	500 ml Poly
MW-67-276-(GB01)	05/06/10	1220	N	N	GW	Y	N	1	500 ml Poly
MW-67-323-(GB01)	05/06/10	1230	N	N	GW	Y	N	1	500 ml Poly
MW-67-340-(GB01)	05/06/10	1224	N	N	GW	Y	N	1	500 ml Poly

TAT Requested: Normal: Rush: Specify: (Subject to Surcharges) Fax Results: Yes / No Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4

Remarks: Are there any known hazards applicable to these samples? If so, please list the hazards

Chain of Custody Signatures

Relinquished By (Signed)	Day	Time	Received By (Signed)	Day	Time
	05/06/10	1710	SECURED	05/06/10	1710
			STORAGE		

GEL PM: Cheryl Duffy Method of Shipment: FEDEX Date Shipped: Airbill #: Airbill #:

Sample Shipping and Delivery Details

Sample Collection Time Zone	Eastern
Central	
Mountain	
Other	

For Lab Receiving Use Only
Custody Seal Intact? YES (N)
Cooler Temp: C

- 1) Chain of Custody Number = Client Determined
- 2) QC Codes: N= Normal Sample, TB = Trip Blank, FD= Field Duplicate, EB = Equipment Blank, MS= Matrix Spike Sample, MSD= Matrix Spike Duplicate Sample, G= Grab, C= Composite
- 3) Field Filtered: For liquid matrices, indicate with a Y - for yes the sample was field filtered or N - for no sample was not field filtered
- 4) Matrix Codes: DW= Drinking Water, GW= Groundwater, SW= Surface Water, WW= Waste Water, MW= Matrix Liquid, SL= Sludge, SS= Solid Waste, O= Oil, F= Filter, P= Pore, U= Urine, F= Fecal, N= Nal
- 5) Sample Analysis Requested: Analytical method requested (i.e. 8200B, 6010B/7470B) and number of containers provided for each (i.e. 8200B 3, 6010B/7470B 4)
- 6) Preservative Type: HA= Hydrochloric Acid, NI= Nitric Acid, SH= Sodium Hydroxide, SA= Sulfuric Acid, AA= Ascorbic Acid, HX= Hexane, ST= Sodium Thiosulfate. If no preservative is added = leave field blank

WHITE = LABORATORY
YELLOW = FILE
PINK = CLIENT

GEL Chain of Custody and Analytical Request

GEL Laboratories, LLC
2040 Savage Road
Charleston, SC 29407
Phone: (843) 556-8171
Fax: (843) 766-1178

Page: 1 of 1
Project #: Entergy GW Mon Prog
GEL Quote #:
COC Number: 50013510
PO Number: Entergy

GEL Work Order Number:

Client Name: Entergy Phone #: (914) 736-8405

Project/Site Name: Indian Point Energy Center Fax #: (914) 734-6247

Address: 450 Broadway, Suite 3, Buchanan, NY 10511

Collected by: M. BRITOS Send Results To: Patrick Donahue

Sample ID <i>* For composites - indicate start and stop date/time</i>	*Date Collected (mm-dd-yy)	*Time Collected (Military) (hh:mm)	QC Code (a)	Field Filtered (b)	Sample Matrix (c)	Should this sample be considered:		Total number of containers	Sample Analysis Requested (d) (Fill in the number of containers for each test)						Preservative Type (e)	Comments Note: extra sample is required for sample specific QC
						Radioactive	TSC A Regulated		Tritium (H3)	Gamma Spec (GS)	Strontium 90 (Sr90)	Nickel 63 (Ni63)				
MW-67-39-(013)	05/06/10	1538	N	N	GW	Y	N	1	1	1	1	1	1	1	2 Liter Poly	
MW-67-105-(012)	05/06/10	1546	N	N	GW	Y	N	1	1	1	1	1	1	1	2 Liter Poly	
MW-67-173-(013)	05/06/10	1603	N	N	GW	Y	N	1	1	1	1	1	1	1	2 Liter Poly	
MW-67-219-(012)	05/06/10	1151	N	N	GW	Y	N	1	1	1	1	1	1	1	2 Liter Poly	
MW-67-276-(012)	05/06/10	1220	N	N	GW	Y	N	1	1	1	1	1	1	1	2 Liter Poly	
MW-67-323-(012)	05/06/10	1230	N	N	GW	Y	N	1	1	1	1	1	1	1	2 Liter Poly	
MW-67-340-(012)	05/06/10	1224	N	N	GW	Y	N	1	1	1	1	1	1	1	2 Liter Poly	

TAT Requested: Normal: Rush: Specify: (Subject to Surcharges) Fax Results: Yes / No / Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4

Remarks: Are there any known hazards applicable to these samples? If so, please list the hazards

Chain of Custody Signatures

Relinquished By (Signed)	Date	Time	Received by (Signed)	Date	Time
	05/06/10	1710	ERIN TRENT	05/06/10	1710

Method of Shipment: FEDEX Date Shipped:
 Airbill #:
 Airbill #:

For Lab Receiving Use Only
Custody Seal Intact? YES / NO / AC
Cooler Temp: C

1) Chain of Custody Number - Client Determined
2) QC Codes: N=Normal Sample, TB=Trip Blank, FD=Field Duplicate, EB=Equipment Blank, MS=Matrix Spike Sample, MSD=Matrix Spike Duplicate Sample, G=Grab, C=Composite
3) Field Filtered: For liquid matrices, indicate with a Y - for yes the sample was field filtered or N - for no sample was not field filtered
4) Matrix Codes: DW=Drinking Water, GW=Groundwater, SW=Surface Water, WW=Waste Water, W=Water, ML=Misc Liquid, SO=Soil, SD=Sediment, SL=Sludge, SS=Soil Waste, O=Oil, F=Filter, P=Wipe, U=Urine, F=Fecal, N=Nasal
5) Sample Analysis Requested: Analytical method requested (i.e. 82609, 60109/7470) and number of containers provided for each (i.e. 2/609-3, 6/60109/7470-1)
6) Preservative Type: HA=Hydrochloric Acid, NI=Nitric Acid, SF=Sulfuric Acid, SA=Ascorbic Acid, AA=Ascorbic Acid, HX=Hexane, ST=Sodium Thiosulfate. If no preservative is added = leave field blank
WHITE = LABORATORY YELLOW = FILE PINK = CLIENT

GEL Chain of Custody and Analytical Request

GEL Laboratories, LLC
2040 Savage Road
Charleston, SC 29407
Phone: (843) 556-8171
Fax: (843) 766-1178

Page: 1 of 1
Project #: Entergy GW Mon Prog
GEL Quote #:
COC Number ⁽¹⁾:
PO Number: 50013510

GEL Work Order Number:

Phone #: (914) 736-8405
Fax #: (914) 734-6247

Client Name: Entergy
Project/Site Name: Indian Point Energy Center
Address: 450 Broadway, Suite 3, Buchanan, NY 10511

Sample Analysis Requested ⁽²⁾ (Fill in the number of containers for each test)

Sample ID <i>* For composites indicate start and stop date/time</i>	*Date Collected (mm-dd-yy)	*Time Collected (Military) (hh:mm)	QC Code (a)	Field Filtered (b)	Sample Matrix (c)	Should this sample be considered:		Total number of containers	Sample Analysis Requested ⁽²⁾			Preservative Type (d)	Comments Note: extra sample is required for sample specific QC
						Radioactive	TSCA Regulated		Gamma Spec (GS)	Strontium 90 (Sr90)	Nickel 63 (Ni63)		
MW-60-35-(013)	05/10/10	1558	N	N	GW	Y	N	1	1	1	1	2 Liter Poly	
MW-60-53-(013)	05/10/10	1631	N	N	GW	Y	N	1	1	1	1	2 Liter Poly	
MW-60-53-(013)-B			N	N	GW	Y	N	1	1	1	1	2 Liter Poly	
MW-60-53-(013)-D	05/10/10	1631	N	N	GW	Y	N	1	1	1	1	2 Liter Poly	
MW-60-53-(013)-S	05/10/10	1631	N	N	GW	Y	N	1	1	1	1	2 Liter Poly	
MW-60-72-(013)	05/10/10	1211	N	N	GW	Y	N	1	1	1	1	2 Liter Poly	
MW-60-135-(013)	05/10/10	1221	N	N	GW	Y	N	1	1	1	1	2 Liter Poly	
MW-60-154-(013)	05/10/10	1232	N	N	GW	Y	N	1	1	1	1	2 Liter Poly	
MW-60-176-(013)	05/10/10	1329	N	N	GW	Y	N	1	1	1	1	2 Liter Poly	

TAT Requested: Normal: Rush: _____ Specify: _____ (Subject to Surcharges) Fax Results: Yes / No / _____
Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4

Sample Collection Time Zone: Pacific
 Eastern
 Central
 Mountain
 Other

Remarks: **Are there any known hazards applicable to these samples? If so, please list the hazards**

Chain of Custody Signatures

Received By (Signed)	Date	Time
<i>[Signature]</i>	05/10/10	1730
<i>[Signature]</i>	05/10/10	1730
<i>[Signature]</i>	05/10/10	1730

Sample Shipping and Delivery Details

GEL PM: ERIN TRENT
 Method of Shipment: FEDEX Date Shipped: _____
 Airbill #: _____
 Airbill #: _____

1) Chain of Custody Number = Client Determined
 2) QC Codes: N = Normal Sample, TB = Trip Blank, FD = Field Duplicate, EB = Equiptment Blank, MS = Matrix Spike Sample, MSD = Matrix Spike Duplicate Sample, G = Grab, C = Composite
 3) Field Filtered: For liquid matrices, indicate with a Y - for yes the sample was field filtered or N - for no sample was not field filtered
 4) Matrix Codes: DW = Drinking Water, GW = Groundwater, SW = Surface Water, WW = Waste Water, W = Water, ML = Misc. Liquid, SO = Soil, SD = Sediment, SL = Sludge, SS = Solid Waste, O = Oil, F = Filter, P = Wipe, U = Urine, F = Fecal, N = Nnal
 5) Sample Analysis Requested: Analytical method requested (i.e. 8260B, 6010B, 7470) and number of containers provided for each (i.e. 8260B-3, 6010B/7470-1)
 6) Preservative Type: BA = Hydrochloric Acid, NI = Nitric Acid, SE = Sodium Hydroxide, SA = Sulfuric Acid, AA = Ascorbic Acid, HX = Hexane, ST = Sodium Thiosulfate. If no preservative is added = leave field blank
WHITE = LABORATORY YELLOW = FILE PINK = CLIENT

For Lab Receiving Use Only
 Custody Seal Intact? YES / NO
 Cooler Temp: C

GEL Chain of Custody and Analytical Request

See www.gel.com for GEL's Sample Acceptance SOP

GEL Laboratories, LLC
2040 Savage Road
Charleston, SC 29407
Phone: (843) 556-8171
Fax: (843) 766-1178

GEL Work Order Number:

Collected by: **Miguel Britos**

Phone #: (914) 736-8405

Fax #: (914) 734-8247

Project/Site Name: Indian Point Energy Center

Address: 450 Broadway, Suite 3, Buchanan, NY 10511

Collected by: Client

Send Results To: Patrick Donahue

Sample Analysis Requested ⁽⁶⁾ (Fill in the number of containers for each test)

Sample ID <small>* For composites - indicate start and stop date/time</small>	*Date Collected (mm-dd-yy)	*Time Collected (Military) (hh:mm)	QC Code ^(b)	Field Filtered ^(a)	Sample Matrix ^(a)	Should this sample be considered:	Total number of containers						Comments Note: extra sample is required for sample specific QC
							Radioactive	TSCA Regulated	Gross Beta	Preservative Type (6)			
MW-60-35-(GB01)	05/10/10	1558	N	N	GW	Y	N	1	1				500 ml Poly
MW-60-53-(GB01)	05/10/10	1631	N	N	GW	Y	N	1	1				500 ml Poly
MW-60-72-(GB01)	05/10/10	1211	N	N	GW	Y	N	1	1				500 ml Poly
MW-60-135-(GB01)	05/10/10	1221	N	N	GW	Y	N	1	1				500 ml Poly
MW-60-154-(GB01)	05/10/10	1232	N	N	GW	Y	N	1	1				500 ml Poly
MW-60-176-(GB01)	05/10/10	1329	N	N	GW	Y	N	1	1				500 ml Poly

TAT Requested: Normal Rush: Specify: (Subject to surcharge) Fax Results: Yes No

Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4

Sample Collection Time Zone: Eastern Pacific

General Mountain

Other

Chain of Custody Signatures

Received by (Signed)	Date	Time
	05/10/10	1730
SECURED STORAGE	05/10/10	1730

GEL PM: Cheryll Duffy

Method of Shipment: FEDEX

Date Shipped:

Airbill #:

Airbill #:

Sample Shipping and Delivery Details

For Lab Receiving Use Only	
Custody Seal Intact?	YES NO
Cooler Temp:	C

1) Chain of Custody Number - Client Determined

2) QC Codes: N=Normal Sample, EB=Trip Blank, FD=Field Duplicate, EB=Equipment Blank, MS=Matrix Spike Sample, MSD=Matrix Spike Duplicate Sample, G=Grab, C=Composite

3) Field Filtered: For liquid matrices, indicate with a Y. For the sample was field filtered on N. For sample was not field filtered

4) Matrix Codes: DW=Drinking Water, GW=Groundwater, SW=Surface Water, WW=Waste Water, W=Water, ML=Misc Liquid, SD=Soil, SD=Soil, SD=Sediment, SL=Sludge, SS=Solid Waste, O=Oil, P=Filter, P=Wipe, E=Liner, F=Facial, N=Nasal

5) Sample Analysis Requested: Analytical method requested (i.e. 8160E, 6010B, 7170) and number of containers provided for each (i.e. 2/2/2/3, 6/1/2/7/7/24 - 1)

6) Preservative Type: HA=Hydrochloric Acid, NI=Nitric Acid, SF=Sulfuric Acid, SA=Sulfuric Acid, AA=Ascorbic Acid, HX=Hexene, ST=Sodium Thionite. Note: If no preservative is added -- leave field blank

WHITE = LABORATORY

YELLOW = FILE

PINK = CLIENT

GEL Chain of Custody and Analytical Request

GEL Laboratories, LLC
2040 Savage Road
Charleston, SC 29407
Phone: (843) 556-8171
Fax: (843) 766-1178

Project #: Entergy GW Mon Prog
GEL Quote #: _____
COC Number ⁽¹⁾: _____
PO Number: 50013510
GEL Work Order Number: _____

Client Name: Entergy Phone #: (914) 736-8405
Project/Site Name: Indian Point Energy Center Fax #: (914) 734-6247
Address: 450 Broadway, Suite 3, Buchanan, NY 10511

Collected by: Miguel Britos Send Results To: Patrick Donahue



Sample ID	*Date Collected (mm-dd-yy)	*Time Collected (Military) (hhmm)	QC Code ⁽²⁾	Field Filtered ⁽³⁾	Sample Matrix ⁽⁴⁾	Sample Analysis Requested ⁽⁵⁾ (Fill in the number of containers for each test)						Preservative Type (6)	Comments	
						Should this sample be considered:	Total number of containers		Gamma Spec (GS)		Tritium (H3)			Strontium 90 (Sr90)
						Radioactive								
MW-32-59-(018)	06/09/10	1453	N	N	GW	Y	N	1	1	1	1	1	1	2 Liter Poly
MW-32-85-(021)	06/09/10	1203	N	N	GW	Y	N	1	1	1	1	1	1	2 Liter Poly
MW-32-149-(018)	06/09/10	1252	N	N	GW	Y	N	1	1	1	1	1	1	2 Liter Poly
MW-32-173-(016)	06/09/10	1223	N	N	GW	Y	N	1	1	1	1	1	1	2 Liter Poly
MW-32-190-(020)	06/09/10	1243	N	N	GW	Y	N	1	1	1	1	1	1	2 Liter Poly

TAT Requested: Normal: Rush: _____ Specify: _____ Fax Results: Yes / No
Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4

Sample Collection Time Zone: Eastern Pacific _____ Other _____
Mountain _____

Remarks: **Are there any known hazards applicable to these samples? If so, please list the hazards**

Chain of Custody Signatures

Signature	Date	Time	Date	Time
	06/09/10	1615	06/09/10	1615
	06/09/10	1615	06/09/10	1615

GEL PM: ERIN TRENT Method of Shipment: FEDEX Date Shipped: _____
Airbill #: _____

For Lab Receiving Use Only
Custody Seal Intact? YES
Cooler Temp. C

1) Chain of Custody Number = Client Determined
2) QC Codes: N = Normal Sample, TB = Trip Blank, FD = Field Duplicate, EB = Equipment Blank, MS = Matrix Spike Sample, MSD = Matrix Spike Duplicate Sample, G = Grab, C = Composite
3) Field Filtered: For liquid matrices, indicate with a 'Y' - For yes the sample was field filtered or 'N' - for sample was not field filtered
4) Matrix Codes: DW=Drinking Water, GW=Groundwater, SW=Surface Water, WW=Waste Water, ML=Misc Liquid, SO=Soil, SD=Settlement, SL=Sludge, SS=Solid Waste, O=Oil, F=Filter, P=Wipe, U=Urine, F=Feal, N=Ncal
5) Sample Analysis Requested: Analytical method requested (i.e. 8260B, 6010B/470A) and number of containers provided for each (i.e. 8260B - 3, 6010B/470A - 1)
6) Preservative Type: HA = Hydrochloric Acid, NI = Nitric Acid, SH = Sulfuric Acid, AA = Ascorbic Acid, HX = Hexane, ST = Sodium Thiosulfate, If no preservative is added = leave field blank
WHITE = LABORATORY YELLOW = FILE PINK = CLIENT



APPENDIX D: 2ND QUARTER 2010 SAMPLING DATA SHEETS

WELL ID: MW 67 - 323

SAMPLE ID: 012

GZA GeoEnvironmental of New York Waterloo Sampling Data Sheet

CLIENT: Entergy - IPEC
 SITE: Buchanan, NY
 WEATHER: Showers, sun + clouds 80°

PROJECT NO: 01.0017869.92
 DATE: 5/6/10
 SAMPLER(S): MB

SAMPLING INTERVAL (depth in ft below top of casing)
317.8 to 328.3

TOTAL VOLUME PURGED: 1.45 gal

SAMPLING PORT
323 2

PURGE RATE: variable (gal / min)

PURGE METHOD: Double Valve Pump

WATER QUALITY:

Time	Purged Volume (gal)	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Drive/Vent Cycle (seconds)	Drive Pressure (psi)
1050	0	PUMP ON						6 / 6	45
1100	0.05	17.63	0.911	0.87	6.80	-70.9	—	↓	↓
1110	0.30	18.14	0.859	0.43	7.08	-120.1	4.26		
1120	0.50	18.59	0.857	0.20	7.02	-174.8	4.10		
1128	0.60	18.74	0.871	0.18	7.00	-231.0	2.00		
1133	0.70	18.81	0.873	0.16	6.99	-286.8	2.38		
1141	0.85	18.87	0.878	0.10	7.00	-297.9	2.29		
1148	1.0	18.89	0.880	0.10	6.98	-302.4	2.33		
1153	1.2	18.89	0.881	0.09	6.97	-289.6	2.37		
1155		PUMP OFF							
1202		START SAMPLE COLLECTION							
1230		SAMPLE COMPLETED : 2 L IPEC 0.5 L IPEC							
1230		PUMP OFF							

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde turbidity meter	2 200704293

NOTES AND OBSERVATIONS:

WELL ID: MW 67 - 276

SAMPLE ID: 012

GZA GeoEnvironmental of New York Waterloo Sampling Data Sheet

CLIENT: Entergy - IPEC

PROJECT NO: 01.0017869.92

SITE: Buchanan, NY

DATE: 5/6/10

WEATHER: Showers, sun and clouds 80°

SAMPLER(S): MB

SAMPLING INTERVAL (depth in ft below top of casing)

250.8 to 281.3

TOTAL VOLUME PURGED:

1.95 gal

SAMPLING PORT

276

3

PURGE RATE: variable (gal / min)

PURGE METHOD: Double Valve Pump

WATER QUALITY:

Time	Purged Volume (gal)	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Drive/Vent Cycle (seconds)	Drive Pressure (psi)
1050	0							6/6	45
1100	0.05	17.49	1.014	1.54	6.82	-36.8	—	↓	↓
1110	0.40	17.85	0.978	0.51	7.16	-64.9	4.57		
1120	0.60	18.09	0.974	0.39	7.09	-57.0	4.15		
1128	0.90	18.49	0.975	0.33	7.25	-56.4	2.70		
1133	1.10	18.48	0.975	0.30	7.29	-56.8	2.48		
1141	1.30	18.42	0.974	0.23	7.29	-57.9	2.40		
1148	1.50	18.40	0.972	0.21	7.30	-58.6	2.45		
1153	1.70	18.36	0.971	0.20	7.31	-59.2	2.39		
1155		PUMP OFF							
1202		START SAMPLE COLLECTION							
1220		SAMPLE COMPLETED			2 L IPEC				
					0.5 L IPEC				
1220		PUMP OFF							

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde	3
turbidity meter	200704293

NOTES AND OBSERVATIONS:

WELL ID: MW 67 - 173

SAMPLE ID: 013

GZA GeoEnvironmental of New York Waterloo Sampling Data Sheet

CLIENT: Entergy - IPEC
 SITE: Buchanan, NY
 WEATHER: Showers, sun+clouds 80°

PROJECT NO: 01.0017869.92
 DATE: 5/6/10
 SAMPLER(S): M. B

SAMPLING INTERVAL (depth in ft below top of casing)
164.8 to 188.3

TOTAL VOLUME PURGED: 0.65 gal

SAMPLING PORT
173

PURGE RATE: variable (gal / min)

PURGE METHOD: Double Valve Pump

5

WATER QUALITY:

Time	Purged Volume (gal)	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Drive/Vent Cycle (seconds)	Drive Pressure (psi)		
1434	0	PUMP ON						8 / 8	20		
1444	0.05		1.076	2.20	6.46	-72.0	5.89	↓	↓		
1454	0.1	21.36	1.044	0.63	6.71	-127.8	7.20				
1504	0.15	21.31	1.096	0.30	6.70	-215.9	4.86				
1513	0.20	20.84	1.148	0.19	6.68	-280.9	5.78				
1518	0.25	20.83	1.142	0.15	6.69	-286.0	5.39				
1523	0.30	20.83	1.131	0.13	6.71	-296.1	5.45				
1529	0.40	20.79	1.119	0.13	6.74	-291.6	5.37				
1534	0.50	20.76	1.117	0.12	6.76	-289.1	5.41				
1535		PUMP OFF									
1536		START SAMPLE COLLECTION									
1603		SAMPLE COMPLETED :				2 L IPEC					
1603		PUMP OFF				0.5 L IPEC					

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde turbidity meter	2 000704293

NOTES AND OBSERVATIONS:

GZA GeoEnvironmental of New York Modified Traditional Purge Sampling Data Sheet

WELL ID: MW-52-11
SAMPLE ID: 005

CLIENT: Entergy - IPEC
SITE: Buchanan, NY
WEATHER: Sunny, 70's

PROJECT NO: 01.0017869.92
DATE: 5/5/10
SAMPLER(S): CBMB

WATER COLUMN HEIGHT (ft) Well Diameter: 2 in

$$\frac{11.0}{DTB} - \frac{8.35}{DTW} = \frac{2.65}{\text{Water Column Height}} \text{ ft}$$

Diameter	Multipliers
1	0.041
2	0.163
4	0.653

GALLONS OF WATER PER WELL VOLUME:

Water Column Height 2.65 x 0.163 Multiplier = 0.432 gal Well Volume

0.432 x 1.5 = 0.65 gal Designed Purge Volume

TOTAL VOLUME PURGED: 0.80 gal

WATER QUALITY: DTW = 8.35 Transducer Actual Depth 1.698

Time	Volume Purged (gal)	DTW or Actual Depth	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Notes
1123	—	8.698							
1138	0	1.687							PUMP ON
1151	0.05	1.397	16.09	2.378	4.29	6.32	96.0	8.56	
1156	0.20	1.209	15.86	2.155	1.55	6.83	45.2	16.33	
1159	0.30	1.119	15.76	2.044	1.56	6.90	38.2	21.32	
1201	0.40	1.046	15.62	2.028	1.65	6.94	19.2	23.60	
1203	0.50	0.984	15.40	2.013	1.67	6.95	18.6	28.57	
1205	0.60	0.914	15.33	2.025	1.72	6.95	11.3	30.22	
1208	0.65	START SAMPLE COLLECTION							
1226		END SAMPLE COLLECTION							2L IPEC
									0.5L IPEC
		PUMP OFF							

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde	6
turbidity meter	2007 01254

NOTES AND OBSERVATIONS:
Depth and Depth to Water (DTW) measurements are given in feet from top of casing.
Groundwater Elevation measurements are given in feet msl.

WELL ID: MW 52 - 18

SAMPLE ID: 005

GZA GeoEnvironmental of New York Waterloo Sampling Data Sheet

CLIENT: Entergy - IPEC
 SITE: Buchanan, NY
 WEATHER: Sunny 80°F

PROJECT NO: 01.0017869.92
 DATE: 5/5/10
 SAMPLER(S): CB, MB

SAMPLING INTERVAL (depth in ft below top of casing)
10.0 to 30.0

TOTAL VOLUME PURGED: 1.35 gal

SAMPLING PORT
18

PURGE RATE: variable (gal / min)
 PURGE METHOD: Double Valve Pump

WATER QUALITY:

Time	Purged Volume (gal)	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Drive/Vent Cycle (seconds)	Drive Pressure (psi)
1500	0		PUMP ON					57/10	14
1510			PUMP OFF						
1512			PUMP ON						
1517	0.2	18.00	2.199	1.98	7.17	44.9	—		
1526	0.4	16.86	2.181	1.05	7.13	25.8			
1536	0.6	16.66	2.186	1.01	7.10	16.3	15.35		
1546	0.9	16.68	2.187	0.99	7.09	17.4	17.07		
1551	1.1	16.67	2.187	1.00	7.09	16.9	17.14		
1556	1.2	16.64	2.190	0.98	7.09	17.8	17.10	↓	↓
1557			PUMP OFF						
1559			START SAMPLE COLLECTION						
1619			SAMPLE COMPLETED :						
						2 L	IPEC		
						0.5 L	IPEC		
			PUMP OFF						

Equipment Used	Equipment Identification #
I 556 MPS Reader and 5563 Sonde turbidity meter	6 200704293

NOTES AND OBSERVATIONS:

WELL ID: MW 52 - 118

SAMPLE ID: 005

GZA GeoEnvironmental of New York Waterloo Sampling Data Sheet

CLIENT: Entergy - IPEC
 SITE: Buchanan, NY
 WEATHER: Sunny 80°F

PROJECT NO: 01.0017869.92
 DATE: 5/5/10
 SAMPLER(S): CB, MB

SAMPLING INTERVAL (depth in ft below top of casing)
110.5 to 123.5

TOTAL VOLUME PURGED: 0.50 gal

SAMPLING PORT
118 4

PURGE RATE: variable (gal / min)
 PURGE METHOD: Double Valve Pump

WATER QUALITY:

Time	Purged Volume (gal)	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Drive/Vent Cycle (seconds)	Drive Pressure (psi)
1059	0	PUMP ON						9/12	55
1110	0.05	18.20	0.854	2.23	7.05	57.4	—	9/12	45
1118	0.08	19.93	0.833	0.80	7.02	13.0			
1128	0.10	20.41	0.834	0.69	6.90	-2.4	10.15		
1135	0.12	20.77	0.834	0.64	6.96	-25.6			
1140	0.15	20.70	0.835	0.64	6.99	-29.9	9.75		
1147	0.18	20.63	0.837	0.61	7.03	-38.9	8.94		
1152	0.20	20.63	0.837	0.60	7.06	-45.1	9.27		
1157	0.22	20.66	0.837	0.60	7.10	-46.9	9.40		
1203	0.25	20.73	0.837	0.61	7.10	-53.8	9.34		
1210	0.28	20.75	0.840	0.62	7.11	-54.1	9.27		
1219	0.29	20.78	0.840	0.63	7.12	-56.0	9.25		
1225	0.30	20.80	0.841	0.64	7.12	-56.7	9.33		
1226		PUMP OFF							
1228		START SAMPLE COLLECTION							
1457		SAMPLE COMPLETED :				2 L	IPEC		
					0.5 L	IPEC			
1457		PUMP OFF							

Equipment Used	Equipment Identification #
1556 MPS Reader and 5563 Sonde turbidity meter	1 200704243

NOTES AND OBSERVATIONS:

WELL ID: MW 52-162

SAMPLE ID: 005

GZA GeoEnvironmental of New York Waterloo Sampling Data Sheet

CLIENT: Entergy - IPEC
 SITE: Buchanan, NY
 WEATHER: Sunny 80°F

PROJECT NO: 01.0017869.92
 DATE: 5/5/10
 SAMPLER(S): CB, MB

SAMPLING INTERVAL (depth in ft below top of casing)
154.5 to 164.0

TOTAL VOLUME PURGED: 1.25 gal

SAMPLING PORT
162 2

PURGE RATE: variable (gal/min)
 PURGE METHOD: Double Valve Pump

WATER QUALITY:

Time	Purged Volume (gal)	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Drive/Vent Cycle (seconds)	Drive Pressure (psi)
1059	0	PUMP ON						9/12	55
1110	0.05	17.62	2.511	1.33	5.39	50.0	—	9/12	45
1118	0.15	18.43	2.428	0.46	6.28	-54.7			
1128	0.20	17.40	2.366	0.30	6.98	-100.0	8.83		
1135	0.30	16.94	2.330	0.17	7.22	-138.1			
1140	0.45	16.74	2.336	0.14	7.24	-149.7	8.78		
1147	0.60	16.64	2.338	0.13	7.24	-158.8	7.68		
1152	0.75	16.56	2.342	0.10	7.24	-163.9	7.49		
1157	0.95	16.52	2.343	0.11	7.25	-165.0	7.56		
1203	1.10	16.53	2.348	0.13	7.25	-167.1	7.48	↓	↓
1205		PUMP OFF							
1206		START SAMPLE COLLECTION							
1239		SAMPLE COMPLETED							
						2 L	IPEC		
						0.5 L	IPEC		
1239		PUMP OFF							

Equipment Used	Equipment Identification #
I 556 MPS Reader and 5553 Sonde turbidity meter	3 200704293

NOTES AND OBSERVATIONS:

WELL ID: MW 39-195

SAMPLE ID: 008

**GZA GeoEnvironmental of New York
Waterloo Sampling Data Sheet**

CLIENT: Entergy - IPEC
 SITE: Buchanan, NY
 WEATHER: Sun + Clouds 70's

PROJECT NO: 01.0017869.92
 DATE: 5/4/10
 SAMPLER(S): CB, MB

SAMPLING INTERVAL (depth in ft below top of casing)
193.0 to 198.6

TOTAL VOLUME PURGED: 0.75 gal

SAMPLING PORT
195

PURGE RATE: variable (gal/min)
 PURGE METHOD: Double Valve Pump

WATER QUALITY:

Time	Purged Volume (gal)	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Drive/Vent Cycle (seconds)	Drive Pressure (psi)
1100	0	PUMP ON						8/10	80
1107	0.01	18.17	1.311	3.45	6.36	-212.9	—		
1119	0.1	19.22	1.421	1.03	6.87	-278.8	—	8/10	71
1124	0.15	19.86	1.411	0.62	7.02	-280.9	5.22		
1129	0.20	20.31	1.401	0.40	7.05	-281.6	4.07		
1137	0.25	20.82	1.390	0.33	7.06	-285.5	3.89		
1145	0.30	21.18	1.376	0.31	7.08	-290.7	3.53		
1153	0.35	20.71	1.372	0.23	7.12	-296.6	3.21		
1202	0.40	20.30	1.364	0.21	7.13	-301.7	3.16		
1208	0.45	20.33	1.353	0.20	7.13	-299.6	3.20		
1214	0.60	20.36	1.349	0.21	7.13	-295.2	3.12	↓	↓
1215		PUMP OFF							
1216		START SAMPLE COLLECTION							
1314		SAMPLE COMPLETED				2 L	IPEC		
1314		PUMP OFF				0.5 L	IPEC		

Equipment Used	Equipment Identification #
1556 MPS Reader and 5563 Sonde turbidity meter	4 200704293

NOTES AND OBSERVATIONS:

WELL ID: MW 39-183

SAMPLE ID: 008

**GZA GeoEnvironmental of New York
Waterloo Sampling Data Sheet**

CLIENT: Entergy - IPEC
 SITE: Buchanan, NY
 WEATHER: Sun + Clouds 70's

PROJECT NO: 01.0017869.92
 DATE: 5/4/10
 SAMPLER(S): CB, MB

SAMPLING INTERVAL (depth in ft below top of casing)
169.5 to 186.0

TOTAL VOLUME PURGED: 1.60 gal

SAMPLING PORT
183 2

PURGE RATE: variable (gal / min)
 PURGE METHOD: Double Valve Pump

WATER QUALITY:

Time	Purged Volume (gal)	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Drive/Vent Cycle (seconds)	Drive Pressure (psi)
1100	0								
1119	0	PUMP ON						8/10	71
1124	0.10	17.75	1.113	1.36	6.48	-173.0	—		
1129	0.20	17.59	1.121	0.54	6.46	-179.9	9.08		
1137	0.30	17.30	1.126	0.36	6.68	-152.9	7.84		
1145	0.40	17.42	1.125	0.28	6.81	-142.0	4.61		
1153	0.55	17.13	1.119	0.24	6.88	-110.1	4.65		
1202	0.75	16.87	1.114	0.24	6.90	-100.4	4.80		
1208	0.90	17.59	1.100	0.24	6.92	-97.6	4.88		
1214	1.10	17.45	1.092	0.21	6.98	-95.4	4.74		
1221	1.30	17.47	1.096	0.21	6.97	-101.6	4.82		
1226	1.45	17.50	1.098	0.20	6.97	-102.4	4.79	↓	↓
1227		PUMP OFF							
1228		START SAMPLE COLLECTION							
1251		SAMPLE COMPLETED				2 L IPEC			
						0.5 L IPEC			
1251		PUMP OFF							

Equipment Used	Equipment Identification #
I 556 MPS Reader and 5563 Sonde turbidity meter	5 200704293

NOTES AND OBSERVATIONS:

WELL ID: MW 39-102

SAMPLE ID: 008

GZA GeoEnvironmental of New York Waterloo Sampling Data Sheet

CLIENT: Entergy - IPEC
 SITE: Buchanan, NY
 WEATHER: Sun + clouds 70's

PROJECT NO: 01.0017869.92
 DATE: 5/4/10
 SAMPLER(S): CB, MB

SAMPLING INTERVAL (depth in ft below top of casing)
93.0 to 103.0

TOTAL VOLUME PURGED: 0.70 gal

SAMPLING PORT
102

PURGE RATE: variable (gal / min)

PURGE METHOD: Double Valve Pump

4

WATER QUALITY:

Time	Purged Volume (gal)	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Drive/Vent Cycle (seconds)	Drive Pressure (psi)
1333	0	PUMP ON						6/8	40
1342	0.01	20.17	2.762	1.90	6.27	-227.4	-		
1352	0.10	20.06	2.743	2.96	6.66	-206.4	16.89		
1402	0.20	20.25	2.729	3.33	6.81	-188.7	13.48		
1412	0.30	21.37	2.730	3.61	6.92	-170.7	11.25		
1419	0.40	19.93	2.734	3.99	6.99	-147.7	10.01		
1424	0.45	19.67	2.726	4.01	7.01	-141.1	9.79		
1429	0.50	19.73	2.722	4.03	7.00	-139.6	9.82		
1434	0.55	19.75	2.719	3.98	7.02	-134.5	9.76	↓	↓
1435		PUMP OFF							
1436		START SAMPLE COLLECTION							
1527		SAMPLE COMPLETED:				2 L	IPEC		
					0.5 L	IPEC			
1527		PUMP OFF							

Equipment Used	Equipment Identification #
1536 MPS Reader and 5563 Sonde turbidity meter	4 200704293

NOTES AND OBSERVATIONS:

GZA GeoEnvironmental of New York Modified Traditional Purge Sampling Data Sheet

WELL ID: MW-57-45
SAMPLE ID: 007

CLIENT: Entergy - IPEC
SITE: Buchanan, NY
WEATHER: SUNNY, 70's

PROJECT NO: 01.0017869.92
DATE: 5/4/10
SAMPLER(S): CB, MB

WATER COLUMN HEIGHT (ft) Well Diameter: 1 in

$$\frac{45}{\text{DTB}} \cdot \frac{5.74}{\text{DTW}} = \frac{39.26}{\text{Water Column Height}} \text{ ft}$$

Diameter	Multipliers
1	0.041
2	0.163
4	0.653

GALLONS OF WATER PER WELL VOLUME:

Water Column Height 39.26 x 0.041 Multiplier = 1.61 gal Well Volume

1.61 x 1.5 = 2.41 gal Designed Purge Volume

TOTAL VOLUME PURGED: 2.60 gal

WATER QUALITY: DTW = 5.74 Transducer Actual Depth 72.276

Time	Volume Purged (gal)	DTW or Actual Depth	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Notes
1134	0	5.74	PUMP	POW					
1158	0.15	—	20.23	2.206	5.49	6.91	184.3	5.00	
1203	0.25	—	20.25	2.202	3.59	6.87	193.1	2.56	
1206	0.40	—	20.24	2.202	3.16	6.90	190.2	5.32	
1209	0.50	—	20.23	2.205	2.96	6.93	188.1	3.28	
1215	0.65	—	20.24	2.210	2.84	6.97	185.2	2.60	
1220	0.75	—	20.24	2.213	2.79	7.00	182.2	2.47	
1225	1.00	—	20.25	2.217	3.02	7.02	179.3	1.15	
	START SAMPLE COLLECTION CB								
1232	1.15	—	20.27	2.221	2.93	7.05	177.2	0.17	
1241	1.25	—	20.27	2.223	2.98	7.07	174.1	0.13	
1250	1.75	—	20.29	2.222	2.98	7.09	171.9	0.10	
1256	2.00	—	20.29	2.222	2.96	7.10	170.6	0.00	
1301	2.25	—	20.28	2.223	2.95	7.11	170.3	0.00	
1310	2.50	—	20.30	2.223	2.92	7.12	168.5	0.00	
	START SAMPLE COLLECTION								
1324	END SAMPLE COLLECTION: 2L IPEC								

PUMP OFF	Equipment Used <u>0.5 L IPEC</u>	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde		1
turbidity meter		2007 01254

NOTES AND OBSERVATIONS:

Depth and Depth to Water (DTW) measurements are given in feet from top of casing.
Groundwater Elevation measurements are given in feet msl.

GZA GeoEnvironmental of New York Modified Traditional Purge Sampling Data Sheet

WELL ID: MW-57-20
SAMPLE ID: 006

CLIENT: Entergy - IPEC
SITE: Buchanan, NY
WEATHER: SUNNY, 70s

PROJECT NO: 01.0017869.92
DATE: 5/4/10
SAMPLER(S): CBMB

WATER COLUMN HEIGHT (ft) Well Diameter: 1 in

$$\frac{20}{\text{DTB}} - \frac{5.02}{\text{DTW}} = \frac{14.98}{\text{Water Column Height}}$$

Diameter	Multipliers
1	0.041
2	0.163
4	0.653

GALLONS OF WATER PER WELL VOLUME:

Water Column Height 14.98 x 0.041 Multiplier = 0.614 gal

0.614 x 1.5 = 0.92 gal

Designed Purge Volume

TOTAL VOLUME PURGED: 1.15 gal

WATER QUALITY: DTW = 5.02 Transducer Actual Depth

Time	Volume Purged (gal)	DTW or Actual Depth	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Notes
1154	0	5.02	PUMP ON						
1158	0.1	—	20.28	2.198	3.38	7.46	62.1	12.09	
1203	0.25	—	20.30	2.194	2.43	7.48	46.1	7.87	
1206	0.35	—	20.30	2.187	2.24	7.50	52.4	1.72	
1209	0.40	—	20.29	2.177	2.17	7.51	68.9	0.20	
1215	0.55	—	20.28	2.150	2.34	7.52	80.7	0.35	
1220	0.75	—	20.29	2.131	2.36	7.52	87.6	0.22	
1225	0.90	—	20.30	2.113	2.39	7.52	89.7	0.24	
1229	START SAMPLE COLLECTION								
1245	END SAMPLE COLLECTION: 2L IPEC								
					0.5 L IPEC				
	PUMP OFF								

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde	2
turbidity meter	200701254

NOTES AND OBSERVATIONS:
Depth and Depth to Water (DTW) measurements are given in feet from top of casing.
Groundwater Elevation measurements are given in feet msl.

GZA GeoEnvironmental of New York Modified Traditional Purge Sampling Data Sheet

WELL ID: MW-57-11
SAMPLE ID: 006

CLIENT: Entergy - IPEC
SITE: Buchanan, NY
WEATHER: SWAINY, 70'S

PROJECT NO: 01.0017869.92
DATE: 5/4/10
SAMPLER(S): CSMPB

WATER COLUMN HEIGHT (ft) Well Diameter: 1 in

$$\frac{11}{\text{DTB}} - \frac{5.00}{\text{DTW}} = \frac{6.00}{\text{Water Column Height}} \text{ ft}$$

Diameter	Multipliers
1	0.041
2	0.163
4	0.653

GALLONS OF WATER PER WELL VOLUME:

Water Column Height 6.00 x 0.041 Multiplier = 0.246 gal Well Volume

0.246 x 1.5 = 0.369 gal Designed Purge Volume

TOTAL VOLUME PURGED: 0.55 gal

WATER QUALITY: DTW = 5.00 Transducer Actual Depth 39.599

Time	Volume Purged (gal)	DTW or Actual Depth	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Notes
1154	0	5.00	PUMP ON						
1158	0.15	—	19.93	1.961	4.31	7.53	204.1	4.39	
1203	0.30	—	19.93	1.933	1.78	7.72	203.5	2.19	
1206	0.35	—	19.92	1.915	1.62	7.76	203.1	2.26	
1209	0.40	—	19.92	1.899	1.56	7.80	202.0	2.15	
1214	START	SAMPLE COLLECTION							
1236	END	SAMPLE COLLECTION							
					2L IPEC				
					0.5 L IPEC				
	PUMP OFF								

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde	3
turbidity meter	200701254

NOTES AND OBSERVATIONS:
Depth and Depth to Water (DTW) measurements are given in feet from top of casing.
Groundwater Elevation measurements are given in feet msl.

GZA GeoEnvironmental of New York Low-Flow Sampling Data Sheet

WELL ID: 11-CSS
SAMPLE ID: 014

CLIENT: Entergy - IPEC
SITE: Buchanan, NY
WEATHER: Rain 70's

PROJECT NO: 01.0017869.92
DATE: 5/3/10
SAMPLER(S): CB, MB
PUMP DEPTH: _____ ft

WATER QUALITY: DTW = 6.00 Transducer Actual Depth -8.579 *transd. reading = 14.125*

Time	DTW or Actual Depth	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (µl/l)	pH (SU)	ORP	Turbidity (NTU)	Flow Rate (gal/hr)	Purged Notes H ₂ O (gal)
1104	8.579		PUMP	ON					
1117	8.300	20.54	2.352	—	6.80	201.2	—		
		Level dropping	PUMP OFF		Let recharge				
1127	8.450		PUMP	ON					
1134	8.463	20.62	2.347	5.59	7.04	152.4	—	< 1	
1139	8.508	20.65	2.345	5.99	7.10	147.1	10.11		
1146	8.498	20.99	2.349	6.60	7.18	145.3	11.78		
1154	8.485	21.29	2.352	6.99	7.28	130.2	11.19		
1159	8.501	21.49	2.352	7.01	7.38	126.4	11.35		
1204	8.524	21.51	2.353	6.96	7.40	123.6	11.40		
1209	8.489	21.53	2.355	6.94	7.42	121.4	11.32	↓	0.25
1210		START SAMPLE COLLECTION							
1558		SAMPLE COMPLETED : 2 L IPEC							
						0.5	L	IPEC	
1558		PUMP OFF							

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde	5
flow meter	#4
turbidity meter	200701254

NOTES AND OBSERVATIONS:

Total volume purged 0.25 gal

Depth and Depth to Water (DTW) measurements are given in feet from top of casing.

Groundwater Elevation measurements are given in feet msl.

WELL ID: MW 54-173

SAMPLE ID: 013

GZA GeoEnvironmental of New York Waterloo Sampling Data Sheet

CLIENT: Entergy - IPEC
 SITE: Buchanan, NY
 CATHETER: RAIN, 11/11/02, 70'

PROJECT NO: 01.0017869.92
 DATE: 5/3/10
 SAMPLER(S): CB, MB

SAMPLING INTERVAL (depth in ft below top of casing)
170.5 to 182.0

TOTAL VOLUME PURGED: 2.25 gal

SAMPLING PORT
173 2

PURGE RATE: variable (gal / min)
 PURGE METHOD: Double Valve Pump

WATER QUALITY:

Time	Purged Volume (gal)	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Drive/Vent Cycle (seconds)	Drive Pressure (psi)
1028	0	PUMP ON						8/4	38
1038	0.1	20.47	1.8108	1.49	7.01	47.9	—		35
1048	0.5	20.38	1.877	0.57	6.94	62.5	7.90		
1058	1.0	20.32	1.878	0.41	6.90	77.7	5.64		
1105	1.15	20.29	1.878	0.33	6.93	82.1	3.32		
1110	1.25	20.26	1.878	0.30	6.95	83.2	0.00		
1115	1.40	20.24	1.878	0.27	6.97	82.9	0.00		
1120	1.75	20.22	1.878	0.26	6.99	82.5	0.00		
1125	2.00	20.20	1.878	0.25	7.00	80.7	0.00	↓	↓
1126	START SAMPLE COLLECTION								
1147	END SAMPLE COLLECTION								
				1.2L IPEC					
				0.5L IPEC					
	PUMP OFF								

Equipment Used	Equipment Identification #
I 556 MPS Reader and 5563 Sonde	
turbidity meter	205704293

NOTES AND OBSERVATIONS:

WELL ID: MW 54-37

SAMPLE ID: 03

GZA GeoEnvironmental of New York Waterloo Sampling Data Sheet

CLIENT: Entergy - IPEC
 SITE: Buchanan, NY
 WEATHER: RAIN, HUMID, 70's

PROJECT NO: 01.0017869.92
 DATE: 5/31/10
 SAMPLER(S): CB, MB

SAMPLING INTERVAL (depth in ft below top of casing)

29.0 to 42.0

TOTAL VOLUME PURGED:

2.75 gal

SAMPLING PORT

37 6

PURGE RATE: variable (gal/min)

PURGE METHOD: Double Valve Pump

WATER QUALITY:

Time	Purged Volume (gal)	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Drive/Vent Cycle (seconds)	Drive Pressure (psi)
1246	0	PUMP ON						6/4	20
1250	0.3	20.60	2.182	1.68	7.12	83.5	—	↓	↓
1258	0.7	20.65	2.221	1.24	7.23	69.1	6.79		
1309	1.0	20.66	2.228	1.20	7.26	69.3	5.13		
1316	1.4	20.69	2.232	1.28	7.27	70.0	3.65		
1326	1.75	20.70	2.234	1.26	7.27	70.2	1.16		
1332	2.00	20.72	2.235	1.23	7.27	71.5	0.00		
1338	2.25	20.72	2.236	1.28	7.26	73.3	0.00		
1344	2.50	20.73	2.237	1.28	7.25	74.7	0.00		
1350	2.75	20.74	2.238	1.29	7.25	75.9	0.00		
1354	STARTS SAMPLE COLLECTION								
1409	END SAMPLE COLLECTION: 2L IPEC 0.5L IPEC								
	PUMP OFF								

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde	1
turbidity meter	2007 04293

NOTES AND OBSERVATIONS:

WELL ID: MW-58-66

SAMPLE ID: 010

GZA GeoEnvironmental of New York Low-Flow Sampling Data Sheet

CLIENT: Entergy - IPEC
 SITE: Buchanan, NY
 WEATHER: Sunny 70's

PROJECT NO: 01.0017869.92
 DATE: 4/30/10
 SAMPLER(S): CB, MB
 PUMP DEPTH: _____ ft

WATER QUALITY: 0950 DTW = 7.44 Transducer Actual Depth = 61.923 Transd. read. = 6.862

Time	DTW or Actual Depth	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Flow Rate (gal/hr)	Purged Notes H ₂ O (gal)
1037	62.043								
1045	62.011	22.82	0.954	3.51	7.74	26.3	—	0.40	
1053	62.045	23.30	0.943	2.29	7.80	-5.9	11.86		0.05
1107	62.088	23.34	0.940	2.01	7.83	20.3	9.29		0.10
1118	62.079	23.31	0.935	1.70	7.78	-45.1	10.68		0.15
1126	62.100	23.29	0.928	1.48	7.88	48.7	12.09		0.20
1131	62.120	23.39	0.928	1.43	7.88	-49.2	11.98		0.23
1139	62.120	23.41	0.929	1.41	7.91	-51.6	12.06		0.25
1146	62.135	23.47	0.930	1.38	7.88	-53.4	11.97	↓	0.30
1148		START SAMPLE COLLECTION							
1351		SAMPLE COMPLETED :							
						2	L	IPEC	
						0.5	L	IPEC	
		PUMP OFF							

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde	1
flow meter	3
turbidity meter	200704293

NOTES AND OBSERVATIONS: Total volume purged 0.45 gal
 Depth and Depth to Water (DTW) measurements are given in feet from top of casing.
 Groundwater Elevation measurements are given in feet msl.

WELL ID: MW 30.69

SAMPLE ID: 031

GZA GeoEnvironmental of New York Waterloo Sampling Data Sheet

CLIENT: Entergy - IPEC
 SITE: Buchanan, NY
 WEATHER: SUNNY, 60's

PROJECT NO: 01.0017869.92
 DATE: 4/29/10
 SAMPLER(S): CBMB

SAMPLING INTERVAL (depth in ft below top of casing)
67.3 to 71.3

TOTAL VOLUME PURGED: 1.65 gal

SAMPLING PORT
69

PURGE RATE: variable (gal / min)

PURGE METHOD: Double Valve Pump

WATER QUALITY:

Time	Purged Volume (gal)	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Drive/Vent Cycle (seconds)	Drive Pressure (psi)
1130	0	PUMP ON						6/7	30
1135	0.10	24.02	1.283	10.93	7.48	142.4	—	↓	↓
1145	0.40	24.46	1.297	10.86	7.83	129.4	—	↓	↓
1150	0.60	24.48	1.28 1.295	11.05	7.93	120.7	—	↓	↓
1155	0.70	24.46	1.290	11.21	7.96	125.7	—	↓	↓
1200	0.80	24.47	1.298	11.47	7.99	124.5	—	6/7	40
1213	1.1	24.33	1.310	11.95	8.04	121.5	—	6/7	41
1220	1.35	24.28	1.326	12.16	8.07	118.4	—	↓	↓
1225	1.50	24.25	1.320	12.28	8.05	118.9	—	↓	↓
1226		PUMP OFF							
1227		START SAMPLE COLLECTION							
1255		SAMPLE COMPLETED							
					0.5 L	IPEC			
1255		PUMP OFF							

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde turbidity meter	1

NOTES AND OBSERVATIONS:

WELL ID: MW 30-84

SAMPLE ID: 022

GZA GeoEnvironmental of New York Waterloo Sampling Data Sheet

CLIENT: Energy - IPEC
 SITE: Buchanan, NY
 WEATHER: SUNNY, 60

PROJECT NO: 01.0017869.92
 DATE: 4/24/10
 SAMPLER(S): CB, MR

SAMPLING INTERVAL (depth in ft below top of casing)
77.3 to 85.4

TOTAL VOLUME PURGED: 0.50 gal

SAMPLING PORT
84

PURGE RATE: variable (gal / min)

PURGE METHOD: Double Valve Pump

WATER QUALITY:

Time	Purged Volume (gal)	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Drive/Vent Cycle (seconds)	Drive Pressure (psi)
1130	0	PUMP	ON					6/7	30
1135								"	"
1200								6/7	40
1213	0.05	23.08	1.711	2.90	6.84	28.9	—	6/7	41
1220	0.10	23.03	1.707	2.89	6.97	9.9	—		
1225	0.15	22.70	1.704	2.91	7.05	8.3	—		
1230	0.20	22.69	1.704	2.96	7.08	10.7	—		
1235	0.25	22.69	1.703	2.96	7.08	11.6	—		
1240	0.30	22.70	1.701	2.98	7.09	12.2			
1245	0.35	22.70	1.700	3.00	7.09	12.5			
1245		PUMP	OFF						
1246		START SAMPLE COLLECTION							
1346		SAMPLE COMPLETED							
					0.5	L	IPEC		
		PUMP	OFF						

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde turbidity meter	<u>6</u>

NOTES AND OBSERVATIONS:

GZA GeoEnvironmental of New York Modified Traditional Purge Sampling Data Sheet

WELL ID: MW-36-41
SAMPLE ID: 012

CLIENT: Entergy - IPEC
SITE: Buchanan, NY
WEATHER: SUNNY, WINDY, 42'S

PROJECT NO: 01.0017869.92
DATE: 4/28/10
SAMPLER(S): CB, MB

WATER COLUMN HEIGHT (ft) Well Diameter: _____ in

<u>41</u> DTB	·	<u>4.58</u> DTW	=	<u>36.42</u> Water Column Height	ft
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Diameter	Multipliers
1	0.041
2	0.163
4	0.653

GALLONS OF WATER PER WELL VOLUME:

Water Column Height 36.42 x 0.041 Multiplier = 1.49 gal Well Volume

1.49 x 1.5 = 2.24 gal
Designed Purge Volume

TOTAL VOLUME PURGED: 2.30 gal

WATER QUALITY: DTW = 4.58 Transducer Actual Depth

Time	Volume Purged (gal)	DTW or Actual Depth	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Notes
1150	0.05	—	18.80	1.992	0.92	8.16	-170.3	—	
1155	0.25	—	18.78	2.006	0.56	8.15	-174.3	7.02	
1205	0.50	—	18.76	1.917	0.77	7.99	-122.3	4.49	
1215	0.75	—	18.78	1.766	1.05	7.80	-88.7	5.96	
1225	1.00	—	18.78	1.451	1.71	7.73	-65.4	4.80	
1232	1.25	—	18.83	1.421	1.62	7.67	-56.6	3.14	
1238	1.35	—	18.86	1.455	1.27	7.63	-53.3	2.43	
1244	1.50	—	18.88	1.465	1.51	7.60	-50.6	2.46	
1250	1.65	—	18.90	1.480	1.61	7.58	-47.8	0.37	
1255	1.75	—	18.91	1.500	1.61	7.57	-45.7	0.00	
1300	1.85	—	18.92	1.509	1.68	7.57	-44.2	0.00	
1305	1.95	—	18.91	1.520	1.65	7.57	-43.2	0.00	
1310	2.00	—	18.90	1.535	1.45	7.56	-40.9	0.00	
1315	2.20	—	18.89	1.537	1.72	7.56	-40.9	0.00	
1317	START	SAMPLE COLLECTION							
1358	END	SAMPLE COLLECTION							

0.5L IPEC

PUMP OFF

Equipment Used

Equipment Identification #

YSI 556 MPS Reader and 5563 Sonde
turbidity meter

2
200701291

NOTES AND OBSERVATIONS:

Depth and Depth to Water (DTW) measurements are given in feet from top of casing.
Groundwater Elevation measurements are given in feet msl.

GZA GeoEnvironmental of New York Modified Traditional Purge Sampling Data Sheet

WELL ID: MW-26-52

SAMPLE ID: 017

CLIENT: Entergy - IPEC
SITE: Buchanan, NY
WEATHER: WINDY, 52 S

PROJECT NO: 01.0017869.92
DATE: 4/26/10
SAMPLER(S): CBMB

WATER COLUMN HEIGHT (ft) Well Diameter: 1 in

$$\frac{52}{\text{DTB}} - \frac{4.91}{\text{DTW}} = \frac{46.09}{\text{Water Column Height}}$$

Diameter	Multipliers
1	0.041
2	0.163
4	0.653

GALLONS OF WATER PER WELL VOLUME:

Water Column Height 46.09 x 0.041 Multiplier = 1.89 gal Well Volume

1.89 x 1.5 = 2.83 gal Designed Purge Volume

TOTAL VOLUME PURGED: 2.90 gal

WATER QUALITY: DTW = 4.91 Transducer Actual Depth

Time	Volume Purged (gal)	DTW or Actual Depth	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Notes
1437	0	—	Pump ON	DN					
1440	0.01	—	18.45	1.740	4.69	7.50	339	—	
1450	0.25	—	18.80	1.809	0.45	7.48	-53.4	11.51	
1500	0.60	—	18.81	1.763	0.32	7.36	-60.3	11.11	
1505	1.00	—	18.84	1.737	0.29	7.34	-62.1	7.61	
1510	1.25	—	18.90	1.712	0.26	7.33	-63.4	7.88	
1515	1.75	—	19.06	1.563	0.28	7.36	-57.8	10.19	
1520	2.25	—	19.07	1.462	0.40	7.29	-52.3	11.49	
1525	2.75	—	19.09	1.527	0.36	7.26	-54.1	7.68	
1528	2.80	—	19.11	1.530	0.36	7.26	-54.7	6.55	
1530	START SAMPLE COLLECTION								
1540	END SAMPLE COLLECTION: 20 IPEC 0.5 L JPEC								
	PUMP OFF								

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde turbidity meter	3 200701254

NOTES AND OBSERVATIONS:

Depth and Depth to Water (DTW) measurements are given in feet from top of casing.
Groundwater Elevation measurements are given in feet msl.

WELL ID: MW 32-85

SAMPLE ID: 020

GZA GeoEnvironmental of New York Waterloo Sampling Data Sheet

CLIENT: Entergy - IPEC
 SITE: Buchanan, NY
 WEATHER: M. Cloudy 50's

PROJECT NO: 01.0017869.92
 DATE: 4/28/10
 SAMPLER(S): CB, MB

SAMPLING INTERVAL (depth in ft below top of casing)
79.3 to 92.8

TOTAL VOLUME PURGED: 140 gal

SAMPLING PORT
85 5

PURGE RATE: variable (gal / min)
 PURGE METHOD: Double Valve Pump

WATER QUALITY:

Time	Purged Volume (gal)	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Drive/Vent Cycle (seconds)	Drive Pressure (psi)
1000	0	PUMP ON						6 7	38
1005		water not reaching surface @ this pressure						8 7	24
1010								8 7	32
1015								8 7	35
1020		Not enough pressure.						8 7	38
1021		PUMP OFF							
1140		PUMP ON						8 7	40
1143		PUMP OFF							
1152		PUMP ON						7 7	45
1158	0.05	16.03	1.588	7.47	7.27	29.4	—	7 7	50
1203	0.15	17.33	1.592	4.00	7.06	19.2	5.49		
1210	0.40	17.71	1.592	2.54	7.34	4.5	5.37		
1216	0.60	17.73	1.587	2.28	7.39	5.7	5.00		
1221	0.80	17.6	1.574	2.25	7.40	6.6	2.41		
1230	1.00	17.6	1.564	2.22	7.35	18.6	2.27		
1235	1.15	17.6	1.559	2.20	7.34	19.7	2.32		
1240	1.25	17.6	1.557	2.19	7.35	18.6	2.29	↓	↓
1241		PUMP OFF							
1242		START SAMPLE COLLECTION							
1308		SAMPLES COMPLETED				2 L IPEC			
						0.5 L IPEC			
		PUMP OFF							

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde turbidity meter	K1 200704293

NOTES AND OBSERVATIONS:

WELL ID: MW 32-131

SAMPLE ID: _____

GZA GeoEnvironmental of New York Waterloo Sampling Data Sheet

CLIENT: Entergy - IPEC
 SITE: Buchanan, NY
 WEATHER: M. Cloudy 50's

PROJECT NO: 01.0017869.92
 DATE: 4/28/10
 SAMPLER(S): CB, MB

SAMPLING INTERVAL (depth in ft below top of casing)
 _____ to _____

TOTAL VOLUME PURGED: _____ gal

SAMPLING PORT
131 4

PURGE RATE: variable (gal / min)

PURGE METHOD: Double Valve Pump

WATER QUALITY:

Time	Purged Volume (gal)	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Drive/Vent Cycle (seconds)	Drive Pressure (psi)
1140	0		PUMP ON					8/7	40
1143			MOSTLY AIR REACHING SURFACE					8/7	60
1152	0.05	15.31	0.700	11.07	7.64	-54.9	—	7/7	45
1158	0.06	15.03	0.630	11.21	7.80	-34.3	—	7/7	45
1159			HEAVY BUBBLING INSIDE FLOW CELL					7/7	50
1203	0.06	14.73	0.492	11.13	7.96	-14.8	—		
1210	0.05	14.32	0.177	11.21	8.12	1.5	—		
1216	0.06	14.12	0.059	11.28	8.18	8.1	—		
1218			No more water reaching the surface.						
			PUMP OFF						
NO SAMPLE									

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde turbidity meter	6 200704293

NOTES AND OBSERVATIONS:

WELL ID: MW 32-149

SAMPLE ID: 017

GZA GeoEnvironmental of New York Waterloo Sampling Data Sheet

CLIENT: Entergy - IPEC
 SITE: Buchanan, NY
 WEATHER: _____

PROJECT NO: 01.0017869.92
 DATE: _____
 SAMPLER(S): _____

SAMPLING INTERVAL (depth in ft below top of casing)
147.3 to 156.8

TOTAL VOLUME PURGED: 0.80 gal

SAMPLING PORT
149 3

PURGE RATE: variable (gal / min)
 PURGE METHOD: Double Valve Pump

WATER QUALITY:

Time	Purged Volume (gal)	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Drive/Vent Cycle (seconds)	Drive Pressure (psi)
1140	0		PUMP	ON				8/7	40
1143			PUMP	OFF					
1152			PUMP	ON				7/7	45
1158	0.05	15.22	1.347	1.840	6.78	-92.0	—	7/7	50
1203	0.10	15.54	1.295	1.58	6.76	-115.3	15.20		
1210	0.15	16.3	1.357	0.90	6.77	-129.9	6.37		
1216	0.20	16.25	1.468	0.69	6.77	-136.8	7.01		
1221	0.30	16.2	1.552	0.45	6.80	-157.6	4		
1230	0.40	16.28	1.571	0.42	6.84	-154.1			
1235	0.45	16.28	1.574	0.30	6.88	-153.0			
1248	0.55	16.29	1.576	0.29	6.89	-151.4			
1252	0.65	16.30	1.577	0.28	6.89	-149.2			
1253			PUMP	OFF					
1254			START SAMPLE COLLECTION						
1350			SAMPLE COMPLETED						
						2	L IPEC		
						0.5	L IPEC		
			PUMP	OFF					

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde	5
turbidity meter	200704293

NOTES AND OBSERVATIONS:

WELL ID: MW 32 - 173

SAMPLE ID: 015

GZA GeoEnvironmental of New York Waterloo Sampling Data Sheet

CLIENT: Energy - IPEC
 SITE: Buchanan, NY
 WEATHER: M. Cloudy 50's

PROJECT NO: 01.0017369.92
 DATE: 4/28/10
 SAMPLER(S): CB, MB

SAMPLING INTERVAL (depth in ft below top of casing)
165.8 to 174.3

TOTAL VOLUME PURGED: 1.45 gal

SAMPLING PORT
173 2

PURGE RATE: variable (gal / min)
 PURGE METHOD: Double Valve Pump

WATER QUALITY:

Time	Purged Volume (gal)	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Drive/Vent Cycle (seconds)	Drive Pressure (psi)
1412	0	PUMP ON						7/9.5	4.9
1422	0.2	16.63	1.715	0.94	6.83	-92.2	-		
1427	0.3	16.92	1.889	0.50	6.82	-114.4			
1434	0.4	16.98	1.988	0.36	6.84	-114.0	9.58		
1440	0.5	16.97	2.016	0.25	6.86	-121.6	8.00		
1447	0.6	17.20	2.025	0.23	6.89	-130.0	5.72		
1455	0.8	17.19	2.031	0.20	6.89	-120.5	6.04		
1500	0.9	17.18	2.037	0.19	6.90	-109.6	5.97		
1508	1.1	17.20	2.041	0.18	6.90	-107.4	6.05		
1513	1.3	17.22	2.042	0.17	6.91	-108.6	6.00	↓	↓
1514		PUMP OFF							
1515		START SAMPLE COLLECTION							
1545		SAMPLE COMPLETED : 2 L IPEC							
						0.5 L IPEC			
		PUMP OFF							

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde	5
turbidity meter	200704293

NOTES AND OBSERVATIONS:

WELL ID: MW 32-190

SAMPLE ID: 019

GZA GeoEnvironmental of New York Waterloo Sampling Data Sheet

CLIENT: Entergy - IPEC
 SITE: Buchanan, NY
 WEATHER: M. Cloudy 50's

PROJECT NO: 01.0017869.92
 DATE: 4/28/10
 SAMPLER(S): CB, MB

SAMPLING INTERVAL (depth in ft below top of casing)
180.3 to 193.9

TOTAL VOLUME PURGED: 0.95 gal

SAMPLING PORT
190

PURGE RATE: variable (gal / min)

PURGE METHOD: Double Valve Pump

WATER QUALITY:

Time	Purged Volume (gal)	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Drive/Vent Cycle (seconds)	Drive Pressure (psi)
1412	0	PUMP ON	ON					7/9.5	49
1422	0.05	15.38	1.681	3.91	7.67	-49.9	—		
1427	0.1	15.81	1.691	2.16	7.73	-81.8			
1434	0.15	16.20	1.701	1.28	7.71	-85.5	8.31		
1440	0.25	16.31	1.706	0.80	7.69	-82.6	7.96		
1447	0.40	16.48	1.710	0.52	7.68	-81.4	6.77		
1455	0.60	16.51	1.714	0.47	7.66	-79.6	6.01		
1500	0.70	16.53	1.714	0.46	7.66	-78.9	5.94		
1505	0.80	16.53	1.715	0.45	7.66	-78.8	5.98	↓	↓
1506		PUMP OFF							
1507		START SAMPLE COLLECTION							
1551		SAMPLE COMPLETED							
						2 L	IPEC		
						0.5 L	IPEC		
		PUMP OFF							

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde turbidity meter	1 200704293

NOTES AND OBSERVATIONS:

GZA GeoEnvironmental of New York Modified Traditional Purge Sampling Data Sheet

WELL ID: MW-37-40
SAMPLE ID: 018

CLIENT: Entergy - IPEC
SITE: Buchanan, NY
WEATHER: OVERCAST, RAIN, 50's

PROJECT NO: 01.0017869.92
DATE: 4/27/10
SAMPLER(S): CB, MB

WATER COLUMN HEIGHT (ft) Well Diameter: 1 in

$$\frac{40}{\text{DTB}} - \frac{8.15}{\text{DTW}} = \frac{31.85}{6.702 \text{ ft}}$$
 Water Column Height

Diameter	Multipliers
1	0.041
2	0.163
4	0.653

GALLONS OF WATER PER WELL VOLUME:

Water Column Height $\frac{31.85}{6.702 \text{ ft}}$ x Multiplier 0.041 = Well Volume $\frac{1.306}{0.274 \text{ ft}}$ gal

1.306 x 1.5 = 1.96 gal
Designed Purge Volume

TOTAL VOLUME PURGED: 2.0 gal

WATER QUALITY: DTW = 8.15 Transducer Actual Depth 32.30

Time	Volume Purged (gal)	DTW or Actual Depth	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Notes
1120	0	32.316	Pump On	Pump On					
1133	0.15	30.101	18.70	2.076	5.35	—	-3.0	—	
1144	0.45	29.977	19.37	2.114	1.10	0.20	-48.7	62.92	
1150	0.75	30.099	19.63	2.135	0.54	2.70	-50.3	174.1	
1156	1.00	30.079	19.68	2.137	0.42	4.48	-45.3	166.7	
1202	1.25	30.079	19.72	2.139	0.39	4.88	-41.8	133.4	
1208	1.45	30.038	19.70	2.138	0.35	5.74	-34.3	119.5	
1216	1.70	30.278	19.78	2.137	0.37	5.89	-24.9	112.0	
1222	1.85	30.119	19.81	2.132	0.38	5.47	-15.4	109.7	
1225	1.95	START SAMPLE COLLECTION							
1243		END SAMPLE COLLECTION: 2L IPEC							
		D.5 L IPEC							
		PUMP OFF							

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde	3
turbidity meter	200701254

NOTES AND OBSERVATIONS:

Depth and Depth to Water (DTW) measurements are given in feet from top of casing.
Groundwater Elevation measurements are given in feet msl.

WELL ID: MW-37-32
 SAMPLE ID: 018

GZA GeoEnvironmental of New York Low-Flow Sampling Data Sheet

CLIENT: Entergy - IPEC
 SITE: Buchanan, NY
 WEATHER: OVERCAST, SD

PROJECT NO: 01.0017869.92
 DATE: 4/27/10
 SAMPLER(S): CB, MB
 PUMP DEPTH: _____ ft

WATER QUALITY: DTW = 9.60 Transducer Actual Depth 5.191

Time	DTW or Actual Depth	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Flow Rate (gal/hr)	Notes gal
1525	14.874	PUMP ON							0
1538	14.812	19.05	2.015	1.49	7.50	200.0	—		0.05
1548	14.876	18.79	2.051	1.44	7.48	197.7	9.58		0.10
1558	14.894	18.89	2.057	0.99	7.48	196.1	9.69		0.18
1605	14.808	18.90	2.0100	0.98	7.48	195.5	5.07		0.23
1610	14.800	18.89	2.0166	0.87	7.46	194.1	4.12		0.30
1615	14.810	18.88	2.065	0.90	7.47	193.7	4.42		0.35
1620	14.841	18.88	2.068	0.87	7.48	192.3	4.35		0.40
1623	START	SAMPLE COLLECTION							
1728	END	SAMPLE COLLECTION							
									0.2 L IPEC
									0.5 L IPEC
		PUMP OFF							

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde	2
flow meter	4
turbidity meter	200701254

NOTES AND OBSERVATIONS: Total volume purged 0.50 gal
 Depth and Depth to Water (DTW) measurements are given in feet from top of casing.
 Groundwater Elevation measurements are given in feet msl.

WELL ID: MW-37-57
 SAMPLE ID: 018

GZA GeoEnvironmental of New York Low-Flow Sampling Data Sheet

CLIENT: Entergy - IPEC
 SITE: Buchanan, NY
 WEATHER: OVERCAST, SDS

PROJECT NO: 01.0017869.92
 DATE: 4/27/10
 SAMPLER(S): CB, MB
 PUMP DEPTH: _____ ft

WATER QUALITY: DTW = 8.22 Transducer Actual Depth 6.568

Time	DTW or Actual Depth	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Flow Rate (gal/hr)	Notes (gal)
1525	42.470	PUMP	DN						0
1538	42.370	19.17	1.972	3.66	7.24	103.1	—		0.05
1548	42.360	19.04	2.041	2.82	7.28	101.0	18.27		0.08
1558	42.352	19.25	2.070	2.15	7.34	107.1	12.32		0.15
1605	42.346	19.28	2.093	2.45	7.35	108.9	5.48		0.25
1610	42.346	19.30	2.101	2.79	7.36	109.8	4.08		0.30
1615	42.344	19.32	2.102	2.18	7.35	109.9	4.20		0.35
1620	42.360	19.36	2.105	2.00	7.36	110.1	3.74		0.40
1625	42.286	19.36	2.104	1.93	7.35	109.7	2.81		0.45
1630	42.294	19.43	2.101	1.91	7.36	108.8	1.85		0.50
1635	42.304	19.50	2.103	1.89	7.36	108.2	0.10		0.55
1640	42.259	19.52	2.104	1.90	7.36	107.7	0.00		0.60
1645	42.265	19.54	2.104	1.90	7.36	106.8	0.00		0.65
1646	START SAMPLE COLLECTION								
1725	END SAMPLE COLLECTION								
									2L IPEC
									0.5L IPEC
	PUMP OFF								

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde	3
flow meter	1
turbidity meter	2002701254

NOTES AND OBSERVATIONS: Total volume purged 0.75 gal
 Depth and Depth to Water (DTW) measurements are given in feet from top of casing.
 Groundwater Elevation measurements are given in feet msl.

WELL ID: MW 63-112

SAMPLE ID: 013

GZA GeoEnvironmental of New York Waterloo Sampling Data Sheet

CLIENT: Entergy - IPEC
 SITE: Buchanan, NY
 WEATHER: RAIN 50's

PROJECT NO: 01.0017869.92
 DATE: 4/26/10
 SAMPLER(S): CB, MB

SAMPLING INTERVAL (depth in ft below top of casing)

106.5 to 112.0

TOTAL VOLUME PURGED:

1.15 gal

SAMPLING PORT

112 4

PURGE RATE: variable (gal / min)

PURGE METHOD: Double Valve Pump

WATER QUALITY:

Time	Purged Volume (gal)	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Drive/Vent Cycle (seconds)	Drive Pressure (psi)
1108	0	PUMP ON	ON					7/7.4	22
1117	0.1	13.11	1.305	1.43	7.60	-31.3	—	↓	↓
1124	0.25	13.02	1.271	0.90	7.42	-7.2	8.19		
1133	0.35	13.05	1.286	0.75	7.30	+5.4	8.27		
1141	0.45	13.16	1.301	0.62	7.25	14.5	5.50		
1148	0.55	13.21	1.306	0.60	7.23	19.6	4.96		
1153	0.70	13.30	1.308	0.55	7.22	21.9	5.02		
1200	0.85	13.36	1.309	0.54	7.20	23.1	4.94		
1206	1.0	13.37	1.309	0.52	7.19	24.0	4.98		
1207		PUMP OFF	OFF						
1208		START SAMPLE COLLECTION							
1239		SAMPLE COMPLETED				2	L	IPEC	
					0.5	L	IPEC		
		PUMP OFF	OFF						

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde turbidity meter	1 200704293

NOTES AND OBSERVATIONS: Install new sensor in YSI #1.

WELL ID: MW-49-65
 SAMPLE ID: 020

GZA GeoEnvironmental of New York Low-Flow Sampling Data Sheet

CLIENT: Entergy - IPEC
 SITE: Buchanan, NY
 WEATHER: SUNNY, WINDY, 60'S

PROJECT NO: 01.0017869.92
 DATE: 4/23/10
 SAMPLER(S): OB, MB
 PUMP DEPTH: _____ ft

WATER QUALITY: DTW = 13.00 Transducer Actual Depth 12.945 TRANS DUCE SURFACE 1.420

Time	DTW or Actual Depth	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Flow Rate (gal/hr)	Notes gal
1154	12.883	PUMP	DN					0.4	0
1218	12.756	14.02	1.895	6.00	6.76	205.6	—		0.01
1225	12.730	14.02	1.897	5.26	6.84	194.3	7.39		0.05
1235	12.652	14.11	1.899	5.22	6.92	182.2	0.56		0.08
1245	12.658	14.24	1.900	5.61	6.97	175.1	0.39		0.09
1255	12.533	14.108	1.899	5.49	7.01	167.2	0.00		0.10
1300	12.536	14.74	1.906	5.35	7.04	162.2	0.00		0.11
1305	12.493	14.77	1.913	5.20	7.05	159.6	0.00		0.15
1310	12.447	14.93	1.911	4.90	7.06	156.8	0.00		0.20
1315	12.455	15.01	1.922	4.36	7.07	153.9	0.00		0.25
1320	12.398	15.10	1.922	4.48	7.09	151.1	0.00		0.28
1325	12.381	15.44	1.922	4.34	6.96	148.4	0.00		0.34
1330	12.365	15.85	1.920	4.26	7.10	145.7	0.00		0.38
1335	12.298	16.30	1.928	4.05	7.12	143.6	0.00		0.43
1340	12.286	16.39	1.929	3.98	7.13	140.3	0.00		0.48
1345	12.246	16.37	1.929	3.95	7.12	139.3	0.00		0.55
1347	START SAMPLE COLLECTION								
1517	END SAMPLE COLLECTION: 2L IPEC								
	0.5L IPEC								
	PUMP OFF								

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde	
flow meter	5
turbidity meter	200704293

NOTES AND OBSERVATIONS: Total volume purged 0.75 gal
 Depth and Depth to Water (DTW) measurements are given in feet from top of casing.
 Groundwater Elevation measurements are given in feet msl.

WELL ID: mw-55-24SAMPLE ID: 014

GZA GeoEnvironmental of New York Low-Flow Sampling Data Sheet

CLIENT: Entergy - IPEC

PROJECT NO: 01.0017869.92

SITE: Buchanan, NY

DATE: 4/21/10WEATHER: SUNNY, 60'sSAMPLER(S): CB, MB

PUMP DEPTH: _____ ft

WATER QUALITY: DTW = _____ Transducer Actual Depth _____

Time	DTW or Actual Depth	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Flow Rate (gal/hr)	Notes gal
1050	5.728	Pump ON							0.0
1102	5.498	20.56	1.020	1.61	8.09	-65.0	—		0.02
1116	5.501	21.35	1.058	1.13	8.19	-43.4	—		0.03
1126	5.500	21.61	1.058	0.92	8.14	-82.0	5.97		0.08
1138	5.582	22.03	1.056	0.80	8.15	-95.2	8.48		0.00
1148	5.542	22.73	1.085	0.74	8.18	-87.6	3.166		0.15
1200	5.377	19.97	1.032	0.87	8.05	-142.8	1.16		0.25
1210	5.421	19.37	0.990	0.53	8.11	-136.7	0.43		0.35
1220	5.403	19.99	1.047	0.49	8.13	-106.7	0.00		0.50
1230	5.459	20.43	1.062	0.51	8.14	-96.7	0.00		0.60
1235	5.477	20.58	1.064	0.46	8.15	-111.7	0.00		0.70
1240	5.461	20.71	1.071	0.43	8.15	-115.3	0.00		0.80
1245	5.609	20.89	1.075	0.42	8.15	-98.3	0.00		0.90
1250	5.587	21.18	1.109	0.51	8.15	-89.3	0.00		1.00
1255	5.459	21.43	1.130	0.51	8.16	-92.9	0.00		1.05
1300	5.481	21.48	1.130	0.52	8.16	-101.6	0.00		1.10
1305	5.526	21.51	1.130	0.51	8.15	-112.0	0.00		1.25
1306	START SAMPLE COLLECTION								
1408	END SAMPLE COLLECTION: 2 L IPEC								
	0.5 L IPEC								
	Pump OFF.								

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde	6
flow meter	1
turbidity meter	200704293

NOTES AND OBSERVATIONS:Total volume purged 1.25 gal

Depth and Depth to Water (DTW) measurements are given in feet from top of casing.

Groundwater Elevation measurements are given in feet msl.

WELL ID: MW-111
 SAMPLE ID: 032

GZA GeoEnvironmental of New York Low-Flow Sampling Data Sheet

CLIENT: Entergy - IPEC
 SITE: Buchanan, NY
 WEATHER: Sun + clouds 60's

PROJECT NO: 01.0017869.92
 DATE: 4/21/10
 SAMPLER(S): CB, MB
 PUMP DEPTH: 16.5 ft

WATER QUALITY: DTW = 8.75 Transducer Actual Depth

Time	DTW or Actual Depth	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (µl)	pH (SU)	ORP	Turbidity (NTU)	Flow Rate (gal/hr)	Purged Notes H ₂ O (gal)	
1149	8.75		PUMP ON							
1157	8.90	16.12	0.757	10.76	8.02	230.7	—	0.5	0.01	
1207	8.93	16.99	0.919	4.01	7.15	186.4	14.81		0.05	
1212	8.90	17.87	0.917	1.99	6.74	172.2	12.42		0.10	
1217	8.90	18.74	0.920	1.90	6.93	151.3	12.06		0.12	
1224	8.88	20.04	0.924	1.71	7.13	134.8	11.68		0.15	
1230	8.88	20.76	0.929	1.60	7.14	120.0	11.47		0.18	
1235	8.88	20.89	0.930	1.59	7.15	118.7	11.57		0.20	
1240	8.88	21.31	0.930	1.61	7.15	117.6	11.60		0.25	
1245	8.88	21.29	0.932	1.57	7.15	117.0	11.54		0.28	
1250	8.88	21.36	0.935	1.54	7.16	116.2	11.50	↓	0.30	
1251		START SAMPLE COLLECTION								
1448		SAMPLES COMPLETED :				2 L	IPEC			
						0.5 L	IPEC			
1448		PUMP OFF								

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde	5
flow meter	4
turbidity meter	200701254

NOTES AND OBSERVATIONS: Total volume purged 0.45 gal
 Depth and Depth to Water (DTW) measurements are given in feet from top of casing.
 Groundwater Elevation measurements are given in feet msl.

GZA GeoEnvironmental of New York Modified Traditional Purge Sampling Data Sheet

WELL ID: MW-45-61
SAMPLE ID: 020

CLIENT: Entergy - IPEC
SITE: Buchanan, NY
WEATHER: M. Sunny 60's

PROJECT NO: 01.0017869.92
DATE: 4/20/10
SAMPLER(S): CB, MB

WATER COLUMN HEIGHT (ft) Well Diameter: 1 in

$$\frac{61}{\text{DTB}} - \frac{25.30}{\text{DTW}} = \frac{35.70}{\text{Water Column Height}} \text{ ft}$$

Diameter	Multipliers
1	0.041
2	0.163
4	0.653

GALLONS OF WATER PER WELL VOLUME:

Water Column Height 35.7 x $\frac{0.041}{\text{Multiplier}}$ = 1.46 gal
Well Volume

1.46 x 1.5 = 2.20 gal
Designed Purge Volume

TOTAL VOLUME PURGED: 2.35 gal

WATER QUALITY: DTW = Transducer Actual Depth

Time	Volume Purged (gal)	DTW or Actual Depth	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Notes
1030	0	PUMP ON							
1035	0.1	-	17.65	0.890	6.80	6.39	141.7	-	
1040	0.3	-	17.89	1.007	4.79	6.23	148.0	125.3	
1043	0.5	-	18.00	1.032	4.15	6.39	136.2	147.5	
1047	0.9	-	18.00	1.074	3.64	6.54	124.1	260.8	
1050	1.2	-	18.16	1.108	3.27	6.68	114.0	289.8	
1054	1.4	-	18.26	1.139	3.06	6.82	104.2	341.7	
1059	1.8	-	18.37	1.150	2.90	6.88	99.8	260.2	
1103	2.2	-	18.36	1.159	2.85	6.94	95.2	264.2	
1104		PUMP OFF							
1105		START SAMPLE COLLECTION							
1113		SAMPLES COMPLETED: 2 L IPEC							
		0.5 L IPEC							
1113		PUMP OFF							

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde	5
turbidity meter	200704293

NOTES AND OBSERVATIONS:

Depth and Depth to Water (DTW) measurements are given in feet from top of casing.
Groundwater Elevation measurements are given in feet msl.

GZA GeoEnvironmental of New York Modified Traditional Purge Sampling Data Sheet

WELL ID: MW-45-42
SAMPLE ID: 020

CLIENT: Entergy - IPEC
SITE: Buchanan, NY
WEATHER: M Sunny 60's

PROJECT NO. 01.0017869.92
DATE: 4/20/10
SAMPLER(S): CB, MB

WATER COLUMN HEIGHT (ft) Well Diameter: 2 in

$$\frac{42}{DTB} \cdot \frac{2386}{DTW} = \frac{18.14}{\text{Water Column Height}} \text{ ft}$$

Diameter	Multipliers
1	0.041
2	0.163
4	0.653

GALLONS OF WATER PER WELL VOLUME:

Water Column Height 18.14 x 0.163 = 2.96 gal

2.96 x 1.5 = 4.44 gal

Multiplier Well Volume
Designed Purge Volume

TOTAL VOLUME PURGED: 3.0 gal

WATER QUALITY: DTW = 23.86 Transducer Actual Depth 17.202 TRANSDUCER READINGS SURFACE: 29.352

Time	Volume Purged (gal)	DTW or Actual Depth	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Notes
0939	0	17.202		PUMP ON					5.5/7@30
0943	0.05	15.737	17.33	1.321	3.33	7.18	230.5	—	
0947	0.2	14.458	17.36	1.229	1.55	7.49	228.8	9.28	
0951	0.3	13.719	17.35	1.209	1.06	7.65	226.2	7.66	
0955	0.75	12.777	17.34	1.199	0.66	7.76	216.5	7.83	
1000	1.00	11.715	17.30	1.191	0.80	7.88	208.9	13.16	
1006	1.250	10.236	17.29	1.175	1.13	8.13	196.7	25.19	
1010	1.50	9.250	17.39	1.180	0.96	8.09	192.5	24.37	
1015	1.75	8.285	17.42	1.187	0.83	8.04	188.0	27.40	
1020	2.25	7.067	17.48	1.191	0.74	8.00	181.1	23.53	
1025	2.75	5.651	17.59	1.194	0.62	7.95	173.9	20.74	
1032	3.00	5.550	18.17	1.194	0.61	7.94	163.0	—	
1033	3.00	WELL DRY, STOPPED PUMP AND LET WELL RECHARGE BEFORE SAMPLING.							
1559		BEGAN SAMPLE COLLECTION.							
1613		END SAMPLE COLLECTION: 2 LIPEC							

Pump OFF Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde	4
turbidity meter	200704293

NOTES AND OBSERVATIONS:

Depth and Depth to Water (DTW) measurements are given in feet from top of casing.
Groundwater Elevation measurements are given in feet msl.

GZA GeoEnvironmental of New York Low-Flow Sampling Data Sheet

WELL ID: MW-56-53
SAMPLE ID: 008

CLIENT: Entergy - IPEC
SITE: Buchanan, NY
WEATHER: SUNNY, 60's

PROJECT NO: 01.0017869.92
DATE: 4/20/10
SAMPLER(S): CB/MB
PUMP DEPTH: _____ ft

WATER QUALITY: DTW = 46.81 Transducer Actual Depth 44.105 SURFACE TRANSDUCER = 22.532

Time	DTW or Actual Depth	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Drive/Vent Cycle (seconds)	Drive Pressure (psi)	Notes gal
1340	44.105	PUMP ON						617	28	0
1347	43.558	16.36	1.1026	4.94	6.19	112.3	—	↓	↓	0.05
1354	43.701	18.19	1.650	4.49	6.46	70.9	9.05	60/7.5	28	0.1
1358	43.827	19.87	1.671	4.25	6.71	49.0	8.43	7.0/7.5	28	0.1
1408	43.881	21.33	1.713	4.19	6.78	42.6	8.10			0.70
1418	43.688	17.67	2.278	4.92	6.80	42.0	7.12			0.30
1428	43.625	16.71	2.489	4.73	6.78	50.8	7.93			0.55
1434	43.600	16.62	2.628	4.35	6.83	53.3	7.49			0.70
1440	43.588	16.76	2.778	4.48	6.90	57.0	6.59			0.80
1445	43.574	17.19	2.806	3.78	6.95	51.6	3.58			0.90
1450	43.565	16.90	2.809	3.76	7.00	54.4	3.24			1.00
1455	43.537	17.08	2.807	3.76	7.00	51.4	3.39			1.10
1459	START SAMPLE COLLECTION									
1523	END SAMPLE COLLECTION :									
					2	L	IPEC			
					0.5	L	IPEC			
1523	PUMP OFF									

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde	5
turbidity meter	200704293

NOTES AND OBSERVATIONS:

Depth and Depth to Water (DTW) measurements are given in feet from top of casing.
Groundwater Elevation measurements are given in feet msl.

Total volume purged 1.25 gal

GZA GeoEnvironmental of New York Modified Traditional Purge Sampling Data Sheet

WELL ID: MW-50-83
SAMPLE ID: 010

CLIENT: Entergy - IPEC
SITE: Buchanan, NY
WEATHER: M. Sunny 60's

PROJECT NO: 01.0017869.92
DATE: 4/20/10
SAMPLER(S): CB, MB

WATER COLUMN HEIGHT (ft) Well Diameter: 1 in

$$\frac{83}{\text{DTB}} - \frac{46.80}{\text{DTW}} = \frac{36.2}{\text{Water Column Height}} \text{ ft}$$

Diameter	Multipliers
1	0.041
2	0.163
4	0.653

GALLONS OF WATER PER WELL VOLUME:

Water Column Height 36.2 x 0.041 Multiplier = 1.484 gal

1.484 x 1.5 = 2.23 gal

Designed Purge Volume

TOTAL VOLUME PURGED: 2.45 gal

WATER QUALITY: DTW = _____ Transducer Actual Depth _____

Time	Volume Purged (gal)	DTW or Actual Depth	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Notes
1410	0		PUMP ON						
1417	0.1	1	PUMP OFF						Tubing clogged with surface runoff debris. Cut off tubing clean and re-start pump.
1430			PUMP ON						
1431	0.4		16.00	1.441	5.01	6.80	15.8		
1435	1.0		16.23	1.646	3.27	6.95	34.5	102.0	
1440	1.5		16.64	1.695	3.32	6.97	43.1	35.82	
1444	2.0		16.71	1.749	3.53	6.99	50.8	25.43	
1445	2.3		16.68	1.761	3.64	7.00	52.7	22.65	
1446			PUMP OFF						
1446			START SAMPLE COLLECTION						
1451			SAMPLES COMPLETED: 2 L IPEC						
			0.5 L IPEC						
1451			PUMP OFF						

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde turbidity meter	4 200701254

NOTES AND OBSERVATIONS:

Depth and Depth to Water (DTW) measurements are given in feet from top of casing.
Groundwater Elevation measurements are given in feet msl.

GZA GeoEnvironmental of New York Modified Traditional Purge Sampling Data Sheet

WELL ID: MW-41-63

SAMPLE ID: 015

CLIENT: Entergy - IPEC
SITE: Buchanan, NY
WEATHER: Sun + Clouds 60F

PROJECT NO: 01.0017869.92
DATE: 4/19/10
SAMPLER(S): CB, MB

WATER COLUMN HEIGHT (ft) Well Diameter: 4 in

$$\frac{103}{DTB} \cdot \frac{26.030}{DTW} = \frac{36.97}{ft} \text{ Water Column Height}$$

Diameter	Multipliers
.1	0.041
2	0.163
4	0.653

GALLONS OF WATER PER WELL VOLUME:

Water Column Height 36.97 x 0.041 Multiplier = 1.52 gal Well Volume

1.52 x 1.5 = 2.27 gal Designed Purge Volume

TOTAL VOLUME PURGED: _____ gal

WATER QUALITY: DTW = 26.030 Transducer Actual Depth = 15.379

Time	Volume Purged (gal)	DTW or Actual Depth	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Notes
1335	0	PUMP ON							
1337	0.1		16.54	1.816	7.84	6.79	215.0	17.73	
1339	0.2		16.64	1.877	6.88	6.72	211.3	15.18	
1342	0.5		16.54	1.972	6.10	6.70	205.0	17.06	
1345	0.9		16.43	2.063	5.64	6.72	196.9	18.71	
1347	1.2		16.53	2.133	5.49	6.77	190.4	17.22	
1350	1.6		16.39	2.197	5.40	6.81	181.3	16.54	
1352	1.9		16.46	2.224	5.36	6.80	178.0	15.72	
1354	2.1		16.51	2.243	5.37	6.80	175.3	14.66	
1355	2.3		16.41	2.256	5.40	6.83	171.5	13.82	
1357		START SAMPLE COLLECTION							
1403		SAMPLE COMPLETED : 2 L IPEC							
1404		" " 0.5 L IPEC							
		PUMP OFF							

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde	4
turbidity meter	200704293

NOTES AND OBSERVATIONS:

Depth and Depth to Water (DTW) measurements are given in feet from top of casing.
Groundwater Elevation measurements are given in feet msl.

GZA GEOENVIRONMENTAL OF NEW YORK
 440 NINTH AVENUE, 18th FLOOR
 NEW YORK, NEW YORK 10001
 SCIENTISTS AND ENGINEERS

Client
Entergy
 Indian Point Energy Center

WELL ID MW-43-28
 SHEET 1 of 1
 FILE NO. 01 0017969.92
 PROJECT LOCATION Indian Point

MANUFACTURER In-Situ PSI CAPACITY _____ DATUM MSL
 MAKE MiniTroll SERIAL NUMBER _____ DATE 4/19/10
 CASING DIAMETER (INCH) _____

GZA ENGINEER _____

ELEVATION OF MEASURING POINT - DEPTH TO WATER = REFERENCE ELEVATION (WATER TABLE ELEVATION)

DEPTH TO WATER + ACTUAL DEPTH = CABLE LENGTH (If transducer is functioning properly)

CASING ABOVE (+) OR BELOW (-) GROUND: _____ FT
 DISTANCE FROM CASING TO GROUND (+ OR -): _____ FT
 MEASURED CABLE LENGTH: _____ FT

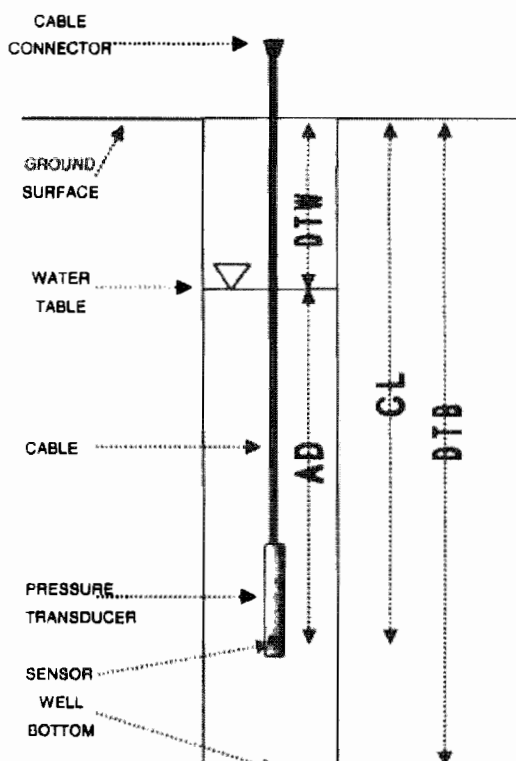
ELEVATION OF MEASURING POINT: 48.021 FT A.S.L.
 DEPTH TO WATER: -15.02 15.56 FT
 REFERENCE ELEVATION: 32.461 FT A.S.L.

TIME OF MEASUREMENT: 0942 HRS
 MEASUREMENT TAKEN FROM: TOC

DEPTH TO WATER: _____ FT
 ACTUAL DEPTH: + _____ FT
 THEORETICAL CABLE LENGTH: = _____ FT

HAVE CLOCKS BEEN SYNCHRONIZED? check
 IS TRANSDUCER SET TO TAKE "SURFACE" READINGS? check

TEST NAME: 0942
 LOGGING INTERVAL: _____ MIN
 TEST START TIME: _____ HRS



LEGEND: **DTW** - DEPTH TO WATER
DTB - DEPTH TO BOTTOM OF WELL
AD - ACTUAL DEPTH OF TRANSDUCER UNDER WATER
CL - CABLE LENGTH FROM SENSOR TO GROUND SURFACE/ TOP OF CASING

NOTES:
 Difference = -0.6

GZA GeoEnvironmental of New York Low-Flow Sampling Data Sheet

WELL ID: MW-43-28
SAMPLE ID: 016

CLIENT: Entergy - IPEC
SITE: Buchanan, NY
WEATHER: M. CLOUDY, SDS

PROJECT NO: 01.0017869.92
DATE: 4/19/10
SAMPLER(S): CB, MB
PUMP DEPTH: _____ ft

WATER QUALITY:		DTW = 15.56	Transducer Actual Depth : 25.209					TRANSDUCER SURFACE : 32.461		
Time	DTW or Actual Depth	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Drive/Vent Cycle (seconds)	Drive Pressure (psi)	Notes gal
0955	25.207	Pump ON						5/13	16	0
1017	25.175							5/13	15	0
1027	25.147	17.63	0.006	9.00	6.94	212.6	—			0.05
1037	25.103	15.24	2.694	10.95	6.76	276.4	—			0.10
1047	25.062	15.02	5.222	5.94	6.71	339.2	—	5.5/18	18	0.14
1057	25.014	14.86	5.227	3.00	6.76	335.8	32.73	5.5/22	16	0.18
1108	25.048	15.35	5.295	2.35	6.77	326.5	12.37			0.19
1118	25.049	15.90	5.308	2.49	6.76	318.1	22.96			0.20
1124	25.033	16.38	5.297	2.05	6.78	313.5	—			0.21
1144	24.990	17.38	5.251	2.02	6.79	297.5	19.19			0.25
1150	24.978	17.23	5.190	1.94	6.79	294.0	14.30			0.26
1155	24.959	16.99	5.199	1.84	6.78	290.7	11.49			0.27
1200	24.955	16.63	5.178	1.79	6.74	287.7	8.78			0.28
1205	24.943	16.30	5.181	1.67	6.80	285.3	7.51			0.29
1210	24.934	16.14	5.160	1.63	6.82	282.6	8.14			0.30
1215	24.943	16.06	5.150	1.50	6.81	279.9	6.58			0.31
1220	24.943	16.25	5.121	1.26	6.75	276.6	7.37			0.32
1225	25.033	16.28	5.117	1.21	6.79	273.9	7.04			0.33
1230	24.898	16.23	5.110	1.20	6.74	271.2	7.26	↓	↓	0.35
1234	START SAMPLE COLLECTION									
1338	END SAMPLE COLLECTION									
						0.2 L IPEC				
						0.5 L IPEC				
	PUMP OFF									

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde	3
turbidity meter	200701254

NOTES AND OBSERVATIONS:

Depth and Depth to Water (DTW) measurements are given in feet from top of casing.
Groundwater Elevation measurements are given in feet msl.

Total volume purged 0.35 gal

WELL ID: MW-42-4e1
 SAMPLE ID: 021

GZA GeoEnvironmental of New York Low-Flow Sampling Data Sheet

CLIENT: Entergy - IPEC
 SITE: Buchanan, NY
 WEATHER: P. Cloudy, 50s

PROJECT NO: 01.0017869.92
 DATE: 4/16/10
 SAMPLER(S): 02, MB
 PUMP DEPTH: _____ ft

WATER QUALITY: DTW = 34.95 Transducer Actual Depth = 34.519 Transd read = 34.519

Time	DTW or Actual Depth	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Drive/Vent Cycle (seconds)	Drive Pressure (psi)	Notes gal
1050	13.629		Pump	ON				5/10	27	0
1059	13.399	13.28	2.910	6.82	8.39	211.3	—	1		0.15
1113	13.383	13.16	2.363	6.90	8.91	203.1	10.72			0.30
1120	13.390	13.07	2.249	6.88	9.23	197.8	8.94			0.45
1132	13.428	13.13	2.148	6.83	9.01	193.6	6.00			0.60
1140	13.448	13.16	2.122	6.84	9.78	190.3	6.16			0.75
1145	13.444	13.13	2.116	6.99	9.83	190.2	5.05			0.90
1150	13.442	13.15	2.113	6.87	9.84	188.5	3.13			1.00
1155	13.440	13.08	2.108	7.19	9.88	186.6	5.58			1.10
1200	13.428	13.12	2.107	6.96	9.89	186.3	5.25			1.15
1205	13.437	13.16	2.107	6.94	9.90	184.3	5.30	▼	▼	1.25
1208	START SAMPLE COLLECTION									
1259	END SAMPLE COLLECTION: 2L IPEC									
										0.5 L IPEC
	Pump OFF									

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde turbidity meter	4 200701254

NOTES AND OBSERVATIONS:

Depth and Depth to Water (DTW) measurements are given in feet from top of casing.
 Groundwater Elevation measurements are given in feet msl.

Total volume purged 1.25 gal

GZA GeoEnvironmental of New York Modified Traditional Purge Sampling Data Sheet

WELL ID: MW-42-78
SAMPLE ID: 016

CLIENT: Entergy - IPEC
SITE: Buchanan, NY
WEATHER: ☁, CLOUDY, 50's

PROJECT NO: 01.0017869.92
DATE: 4/16/10
SAMPLER(S): CB, MB

WATER COLUMN HEIGHT (ft) Well Diameter: 1 in

$$\frac{78}{\text{DTB}} \cdot \frac{33.67}{\text{DTW}} = \frac{44.33}{\text{Water Column Height}}$$

Diameter	Multipliers
1	0.041
2	0.163
4	0.653

GALLONS OF WATER PER WELL VOLUME:

Water Column Height 44.33 x 0.041 Multiplier = 1.818 gal
Well Volume

1.818 x 1.5 = 2.73 gal
Designed Purge Volume

TOTAL VOLUME PURGED: 2.90 gal

WATER QUALITY: DTW = _____ Transducer Actual Depth _____

Time	Volume Purged (gal)	DTW or Actual Depth	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Notes
1239	0	PUMP ON							
1242	0.05	13.8	13.88	1.999	9.18	6.70	211.9	—	
1247	1.00	—	14.88	2.093	6.78	6.57	201.2	945.2	
1251	1.25	—	14.92	2.115	6.49	6.66	193.8	791.0	
1257	1.50	—	14.54	2.113	6.34	6.71	185.1	870.4	
1302	1.75	—	14.52	2.110	5.93	6.74	179.1	615.6	
1306	2.00	—	14.51	2.113	5.69	6.77	174.5	575.2	
1313	2.50	—	14.72	2.116	5.68	6.81	166.7	313.3	
1316	2.75	—	14.84	2.116	5.50	6.84	161.5	359.6	
1318	START SAMPLE COLLECTION								
1329	END SAMPLE COLLECTION: 2L IPEC								
	0.5L IPEC								
	PUMP OFF								

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde	5
turbidity meter	200701254

NOTES AND OBSERVATIONS:

Depth and Depth to Water (DTW) measurements are given in feet from top of casing.
Groundwater Elevation measurements are given in feet msl.

WELL ID: MW 40-162

SAMPLE ID: 012

GZA GeoEnvironmental of New York Waterloo Sampling Data Sheet

CLIENT: Entergy - IPEC
 SITE: Buchanan, NY
 WEATHER: Sunny 70's

PROJECT NO: 01.0017869.92
 DATE: 4/15/10
 SAMPLER(S): CB, MB

SAMPLING INTERVAL (depth in ft below top of casing)
158.7 to 190.3

TOTAL VOLUME PURGED: 0.70 gal

SAMPLING PORT
162

PURGE RATE: variable (gal / min)

PURGE METHOD: Double Valve Pump

WATER QUALITY:

Time	Purged Volume (gal)	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Drive/Vent Cycle (seconds)	Drive Pressure (psi)
1000	0	PUMP ON						6/9	42
1020	0.01	17.13	1.308	0.77	6.35	-93.3	--	↓	↓
1030	0.10	18.00	1.295	0.26	6.52	-141.0	10.36		
1043	0.20	18.58	1.296	0.19	6.67	-146.4	9.90		
1052	0.25	18.74	1.301	0.19	6.78	-150.2	8.19		
1101	0.30	18.07	1.304	0.18	6.91	-149.6	6.56		
1109	0.40	18.09	1.295	0.18	6.97	-147.0	7.08		
1114	0.45	18.02	1.297	0.16	6.99	-149.2	7.10		
1119	0.50	17.98	1.300	0.16	7.00	-149.2	7.15		
1126	0.55	17.96	1.295	0.16	7.04	-143.5	7.20		
1134		PUMP OFF							
1135		START SAMPLE COLLECTION							
1450		SAMPLE COMPLETED			2	L	IPEC		
					2	L	DEC		
					0.5	L	IPEC		

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde turbidity meter	2 200704243

NOTES AND OBSERVATIONS:

WELL ID: MW 40 - 127

SAMPLE ID: 014

GZA GeoEnvironmental of New York Waterloo Sampling Data Sheet

CLIENT: Entergy - IPEC
 SITE: Buchanan, NY
 WEATHER: Sunny 70's

PROJECT NO: 01.0017869.92
 DATE: 4/15/10
 SAMPLER(S): CB, MB

SAMPLING INTERVAL (depth in ft below top of casing)
125.2 to 136.7

TOTAL VOLUME PURGED: 1.30 gal

SAMPLING PORT
127 2

PURGE RATE: variable (gal / min)

PURGE METHOD: Double Valve Pump

WATER QUALITY:

Time	Purged Volume (gal)	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Drive/Vent Cycle (seconds)	Drive Pressure (psi)
1000	0	PUMP ON						6/9	42
1020	0.1	15.76	2.133	0.78	6.56	-87.1	—	↓	↓
1030	0.2	15.90	2.140	0.37	6.90	-124.8	10.49		
1043	0.3	16.05	2.142	0.27	6.96	-141.1	10.30		
1052	0.45	15.91	2.154	0.25	7.00	149.1	8.21		
1101	0.60	15.73	2.159	0.20	7.02	-153.7	4.71		
1109	0.75	15.65	2.162	0.21	7.03	-155.3	4.99		
1114	0.85	15.63	2.164	0.22	7.03	-156.6	8.60		
1119	1.0	15.68	2.169	0.20	7.03	-157.6	8.70		
1126	1.15	15.66	2.170	0.19	7.04	-158.2	8.66		
1134		PUMP OFF							
1135		START SAMPLE COLLECTION							
1313		SAMPLE COMPLETED							
						2 L IPEC			
						2 L DEC			
						0.5 L IPEC			
1313		PUMP OFF							

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde turbidity meter	3 200704293

NOTES AND OBSERVATIONS:

WELL ID: MW 40 - 100

SAMPLE ID: 014

GZA GeoEnvironmental of New York Waterloo Sampling Data Sheet

CLIENT: Entergy - IPEC
 SITE: Buchanan, NY
 WEATHER: Sunny 70's

PROJECT NO: 01.0017869.92
 DATE: 4/15/10
 SAMPLER(S): CB, MB

SAMPLING INTERVAL (depth in ft below top of casing)
93.2 to 106.7

TOTAL VOLUME PURGED: 3.85 gal

SAMPLING PORT
100 3

PURGE RATE: variable (gal / min)

PURGE METHOD: Double Valve Pump

WATER QUALITY:

Time	Purged Volume (gal)	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Drive/Vent Cycle (seconds)	Drive Pressure (psi)
1000	0	PUMP	ON					6/9	42
1020	0.2	14.99	2.729	0.61	6.49	-44.6	—		
1030	1.0	14.98	2.739	0.42	6.69	-24.0	16.29		
1043	1.3	15.21	2.734	0.43	6.76	-14.8	15.30		
1052	1.8	15.07	2.736	0.45	6.80	-4.2	11.56		
1101	2.3	15.08	2.733	0.45	6.84	+2.9	18.43		
1109	2.5	15.16	2.736	0.48	6.87	+8.6	13.50		
1114	2.6	15.17	2.728	0.49	6.87	+11.9	13.39		
1119	2.8	15.00	2.732	0.49	6.88	+13.6	13.63		
1126	3.0	14.87	2.728	0.50	6.90	+19.1	14.21		
1136	3.5	14.84	2.721	0.50	6.88	+18.6	14.16		
1141	3.7	14.80	2.720	0.51	6.89	20.0	14.23	↓	↓
1141		PUMP	OFF						
1142		START	SAMPLE COLLECTION						
1216		SAMPLE COMPLETED				2 L	IPEC		
						2 L	DEC		
						0.5 L	IPEC		
1216		PUMP	OFF						

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 556.1 Sonde turbidity meter	5 200704293

NOTES AND OBSERVATIONS:

WELL ID: MW 40-81

SAMPLE ID: 012

GZA GeoEnvironmental of New York Waterloo Sampling Data Sheet

CLIENT: Entergy - IPEC
SITE: Buchanan, NY
WEATHER: Sunny 70's

PROJECT NO: 01.0017869.92
DATE: 4/15/10
SAMPLER(S): CB, MB

SAMPLING INTERVAL (depth in ft below top of casing)
64.7 to 84.2

TOTAL VOLUME PURGED: 5.35 gal

SAMPLING PORT
81 4

PURGE RATE: variable (gal / min)
PURGE METHOD: Double Valve Pump

WATER QUALITY:

Time	Purged Volume (gal)	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Drive/Vent Cycle (seconds)	Drive Pressure (psi)
1000	0	PUMP ON						6/9	42
1020	0.60	14.43	1.588	2.07	6.85	-33.3	—		
1030	1.40	14.56	1.575	1.86	6.85	-38.9	10.11		
1043	1.90	14.70	1.568	1.85	6.85	-25.4	9.29		
1052	2.30	14.79	4.563	1.87	6.85	-9.0	6.55		
1101	2.65	14.75	4.568	1.86	6.86	+0.0	8.27		
1109	3.00	14.79	4.572	1.85	6.86	+9.2	9.67		
1114	3.20	14.80	4.574	1.84	6.85	15.9	9.71		
1119	3.50	14.75	4.573	1.84	6.86	24.6	9.92		
1126	4.00	14.79	4.582	1.84	6.87	28.0	10.00		
1136	4.50	14.74	4.576	1.83	6.87	27.6	10.40		
1141	4.70	14.38	4.584	1.82	6.87	29.2	10.48		
1146	4.90	14.34	4.587	1.84	6.87	30.6	10.54		
1151	5.20	14.38	4.586	1.82	6.87	31.0	10.49	↓	↓
1151		PUMP OFF							
1152		START SAMPLE COLLECTION							
1215		SAMPLE COMPLETED				2 L IPEC			
						2 L DEC			
						0.5 L IPEC			
1215		PUMP OFF							

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde turbidity meter	4 200704293

NOTES AND OBSERVATIONS:

WELL ID: MW-33

SAMPLE ID: 026

GZA GeoEnvironmental of New York Low-Flow Sampling Data Sheet

CLIENT: Entergy - IPEC
 SITE: Buchanan, NY
 WEATHER: SUNNY, 70's

PROJECT NO: 01.0017869.92
 DATE: 4/15/10
 SAMPLER(S): ChymB
 PUMP DEPTH: 110 ft

WATER QUALITY: DTW = 8.32 Transducer Actual Depth = 7.079 ^{TRANSDUCER SURFACE READING: 10.835}

Time	DTW or Actual Depth	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Flow Rate (gal/hr)	Notes gal
1158	17.085		PUMP	ON				0.2	0
1208	16.921	15.17	1.023	5.11	6.75	133.2	—		0.15
1220	16.802	14.83	1.042	1.66	7.10	-17.9	19.37		0.30
1230	16.768	15.06	1.043	1.23	7.26	-33.4	8.15		0.50
1235	16.776	15.15	1.042	1.18	7.31	-39.4	7.44		0.75
1240	16.812	15.63	1.041	1.09	7.38	-42.6	5.37		0.80
1246	16.835	15.87	1.042	1.08	7.41	-44.8	3.54		0.95
1250	16.825	15.97	1.044	1.10	7.42	-45.8	3.54		1.00
1255	16.787	15.22	1.045	1.05	7.39	-49.2	1.166		1.20
1300	16.774	15.59	1.044	0.89	7.42	-48.4	0.666		1.50
1305	16.771	15.74	1.045	0.85	7.44	-48.5	1.52		1.75
1310	16.770	15.50	1.048	0.85	7.44	-50.2	2.78		1.95
1315	16.772	15.41	1.047	0.79	7.45	-49.9	1.54		2.00
1320	16.779	15.51	1.046	0.79	7.47	-46.0	1.41		2.15
1325	16.781	15.57	1.046	0.78	7.46	-47.6	1.45		2.25
1328	START SAMPLE COLLECTION								
1354	END SAMPLE COLLECTION								
					7.2	IPEC			
					0.51	IPEC			
	PUMP	OFF							

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde	6
flow meter	3
turbidity meter	200701254

NOTES AND OBSERVATIONS: Total volume purged 2.40 gal
 Depth and Depth to Water (DTW) measurements are given in feet from top of casing.
 Groundwater Elevation measurements are given in feet msl.

GZA GeoEnvironmental of New York Modified Traditional Purge Sampling Data Sheet

WELL ID: MW-53-120
SAMPLE ID: 019

CLIENT: Entergy - IPEC
SITE: Buchanan, NY
WEATHER: Sunny 70°F

PROJECT NO: 01.0017869.92
DATE: 4/14/10
SAMPLER(S): CB, MB

WATER COLUMN HEIGHT (ft) Well Diameter: _____ in
 $\frac{120}{\text{DTB}} - \frac{60.29}{\text{DTW}} = \frac{59.71}{\text{Water Column Height}}$ ft

Diameter	Multipliers
1	0.041
2	0.163
4	0.653

GALLONS OF WATER PER WELL VOLUME:

Water Column Height 59.71 x $\frac{0.041}{\text{Multiplier}}$ = 2.45 gal
Well Volume

2.45 x 1.5 = 3.67 gal
Designed Purge Volume

TOTAL VOLUME PURGED: 3.75 gal

WATER QUALITY: DTW = _____ Transducer Actual Depth _____

Time	Volume Purged (gal)	DTW or Actual Depth	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Notes
1328	0		PUMP ON						
1333	0.1	—	15.28	1.489	4.90	7.25	202.8	33.85	
1337	0.3	—	15.70	1.498	3.01	7.23	197.7	35.61	
1342	0.6	—	15.57	1.521	2.10	7.22	191.4	63.39	
1347	1.0	—	15.75	1.586	1.27	7.21	188.7	140.4	
1351	1.5	—	16.09	1.692	0.67	7.20	182.1	177.6	
1358	2.0	—	16.20	1.754	0.49	7.21	175.8	169.5	
1402	2.5	—	16.07	1.783	0.41	7.20	171.3	125.6	
1407	3.1	—	16.05	1.800	0.80	7.19	168.2	150.6	
1412	3.6	—	16.24	1.800	2.25	7.18	165.4	167.4	
1417			PUMP OFF						
1427			START SAMPLE COLLECTION						
1436			SAMPLE COMPLETED : 2L IPEC						
			2L NRC						
			0.5L IPEC						

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde	4
turbidity meter	200704293

NOTES AND OBSERVATIONS:

Depth and Depth to Water (DTW) measurements are given in feet from top of casing.
Groundwater Elevation measurements are given in feet msl.

WELL ID: MW-53-82

SAMPLE ID: 015

GZA GeoEnvironmental of New York Low-Flow Sampling Data Sheet

CLIENT: Entergy - IPEC

SITE: Buchanan, NY

WEATHER: Sunny 70°F

PROJECT NO:

01.0017869.92

DATE:

4/14/10

SAMPLER(S):

CB, MB

PUMP DEPTH:

ft

WATER QUALITY:

DTW = 59.62Transducer Actual Depth = 21.951Transd
read = 10.315

Time	DTW or Actual Depth	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Drive/Vent Cycle (seconds)	Drive Pressure (psi)	Purged Notes H ₂ O (gal)
1113	21.954							6/5	37	
1118	21.952							6/5	50	
1121	21.766							6/5	40	
1131	21.810	14.63	2.643	4.94	6.63	214.8	—			
1136	21.848	14.19	2.675	4.90	6.85	208.1	18.31			0.05
1141	21.866	13.66	2.713	5.25	7.13	203.2	20.26			
1149	21.864	13.24	2.730	6.40	7.31	193.6	28.14			0.10
1157	21.835	13.35	2.717	6.53	7.36	189.4	32.78	5/9	40	
1204	21.870	13.48	2.721	6.32	7.43	187.0	32.96			0.20
1211	21.870	13.40	2.727	6.57	7.46	185.7	32.01			0.25
1218	21.892	13.46	2.724	6.60	7.48	184.7	31.10			0.30
1224	21.888	13.45	2.728	6.55	7.51	186.3	30.22			
1229	21.897	13.37	2.732	6.68	7.55	184.4	29.17			
1234	21.913	13.38	2.731	6.69	7.58	184.9	28.58			0.40
1243	21.904	13.50	2.726	7.00	7.58	183.9	22.49			
1253	21.879	13.42	2.726	6.80	7.60	181.9	20.09			
1303	21.868	13.40	2.726	6.83	7.61	180.2	18.87			0.55
1310	21.866	13.56	2.729	6.79	7.63	170.4	16.71			
1319	21.861	13.60	2.731	6.76	7.64	169.9	16.62			0.70
1324	21.839	13.61	2.732	6.78	7.64	170.7	16.51			0.75
1325		START SAMPLE COLLECTION								
1514		SAMPLE COMPLETED : 2 L IPEC								
		2 L NRC								
		0.5 L IPEC								
1514		PUMP OFF								

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde	4
turbidity meter	200704293

NOTES AND OBSERVATIONS:

Total volume purged 0.90 gal

Depth and Depth to Water (DTW) measurements are given in feet from top of casing.

Groundwater Elevation measurements are given in feet msl.

WELL ID: MW 31-85

SAMPLE ID: 023

GZA GeoEnvironmental of New York Waterloo Sampling Data Sheet

CLIENT: Entergy - IPEC
 SITE: Buchanan, NY
 WEATHER: SUNNY, 60's

PROJECT NO: 01.0017869.92
 DATE: 4/14/10
 SAMPLER(S): CB, MB

SAMPLING INTERVAL (depth in ft below top of casing)
69.8 to 85.4

TOTAL VOLUME PURGED: 2.70 gal

PURGE RATE: variable (gal / min)

SAMPLING PORT
85

PURGE METHOD: Double Valve Pump

WATER QUALITY:

Time	Purged Volume (gal)	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Drive/Vent Cycle (seconds)	Drive Pressure (psi)
0937	0	PUMP	DN					6/7	29
0941	0.05	14.91	0.902	8.18	5.61	133.0	—		
0950	0.20	15.51	1.857	3.44	5.75	-52.2	3.60		
1000	0.50	16.29	1.978	4.11	5.80	-16.8	3.75		
1005	0.75	16.57	2.005	4.12	5.92	-4.4	0.00		
1010	1.00	16.64	2.012	4.18	5.95	0.7	0.00		
1015	1.15	16.74	2.015	4.21	5.98	5.7	2.28		
1021	1.25	16.84	2.020	4.26	5.99	11.0	4.71		
1030	1.75	17.34	1.4169	2.168	7.33	38.3	CB		
1030	1.75	17.82	2.021	4.12	6.18	20.5	7.00		
1035	2.00	18.07	2.024	4.14	6.37	25.2	7.48		
1040	2.15	18.14	2.028	4.21	6.48	28.2	5.09	↓	↓
1052	2.45	18.60	2.031	4.27	6.67	30.8	3.90	6/7	28
1057	2.50	18.50	2.036	4.26	6.75	31.3	3.83	↓	↓
1102	2.55	18.27	2.031	4.15	6.76	24.6	3.84	↓	↓
1109	START SAMPLE COLLECTION								
1209	END SAMPLE COLLECTION: 2L IPEC								
	2L DEC								
	0.5L IPEC								
	PUMP OFF								

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde	6
turbidity meter	200701254

NOTES AND OBSERVATIONS:

WELL ID: MW 31-49

SAMPLE ID: 023

GZA GeoEnvironmental of New York Waterloo Sampling Data Sheet

CLIENT: Entergy - IPEC
 SITE: Buchanan, NY
 WEATHER: SUNNY, 60'S

PROJECT NO: 01.0017869.92
 DATE: 4/14/10
 SAMPLER(S): CB, MB

SAMPLING INTERVAL (depth in ft below top of casing)
34.8 to 49.3

TOTAL VOLUME PURGED: 2.55 gal

SAMPLING PORT
49

PURGE RATE: variable (gal / min)

PURGE METHOD: Double Valve Pump

WATER QUALITY:

Time	Purged Volume (gal)	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Drive/Vent Cycle (seconds)	Drive Pressure (psi)
0937	0	PUMP	ON					6/7	29
0941	0.05	16.26	2.016	5.42	7.06	85.2	—		
0950	0.5	16.75	2.217	4.94	7.12	111.5	0.00		
1000	1.25	17.12	2.261	5.01	7.13	124.6	0.00		
1005	1.75	17.22	2.264	5.02	7.13	127.8	0.00		
1010	2.00	17.27	2.251	5.00	7.12	129.8	0.00		
1015	2.40	17.29	2.269	4.98	7.12	131.3	0.00	↓	↓
1021	START SAMPLE COLLECTION								
1042	END SAMPLE COLLECTION: 2L IPEC								
				2L DEC					
				0.5L IPEC					
	PUMP OFF								

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde	3
turbidity meter	200701254

NOTES AND OBSERVATIONS:

WELL ID: MW 31-63

SAMPLE ID: 023

GZA GeoEnvironmental of New York Waterloo Sampling Data Sheet

CLIENT: Entergy - IPEC
 SITE: Buchanan, NY
 WEATHER: SUNNY, 60's

PROJECT NO: 01.0017869.92
 DATE: 4/14/10
 SAMPLER(S): CB, MB

SAMPLING INTERVAL (depth in ft below top of casing)
55.8 to 63.8

TOTAL VOLUME PURGED: 3.15 gal

SAMPLING PORT
63

PURGE RATE: variable (gal / min)

PURGE METHOD: Double Valve Pump

WATER QUALITY:

Time	Purged Volume (gal)	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Drive/Vent Cycle (seconds)	Drive Pressure (psi)
0937	0	PUMP	DN					617	29
0941	0.05	15.06	1.426	1.17	7.27	-40.3	—		
0950	0.2	15.19	1.416	1.109	7.27	-47.3	2.59		
1000	0.4	15.80	1.412	2.37	7.31	-22.6	1.81		
1005	0.55	16.08	1.409	2.57	7.32	-8.1	0.02		
1010	0.75	16.25	1.414	2.57	7.33	2.7	4.05		
1015	0.85	16.38	1.420	2.69	7.33	14.3	0.95		
1021	0.95	16.62	1.441	2.87	7.32	28.1	10.50		
1030	1.10	17.34	1.4109	2.68	7.33	38.3	4.77		
1035	1.20	17.80	1.483	2.106	7.32	45.1	4.51		
1040	1.30	17.94	1.492	2.62	7.32	48.6	4.13	↓	↓
1052	2.00	18.13	1.511	8.63	7.85	50.2	5.48	617	28
1057	2.50	18.44	1.511	7.88	7.82	53.4	5.37		
1102	2.75	18.56	1.514	7.04	7.84	60.5	5.16		
1109	2.85	18.96	1.505	4.101	7.44	63.9	2.11		
1114	2.95	19.06	1.503	4.01	7.41	64.4	2.32		
1119	3.00	19.08	1.504	3.98	7.38	64.1	2.16	↓	↓
1122	START SAMPLE COLLECTION								
1305	END SAMPLE COLLECTION: 2L IPEC 2L DEC 0.5L IPEC								
	PUMP OFF								

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde	2
turbidity meter	2007.01254

NOTES AND OBSERVATIONS:

WELL ID: MW 62-53

SAMPLE ID: 012

GZA GeoEnvironmental of New York Waterloo Sampling Data Sheet

CLIENT: Entergy - IPEC
 SITE: Buchanan, NY
 WEATHER: cloudy, 50's

PROJECT NO: 01.0017869.92
 DATE: 4/13/10
 SAMPLER(S): CB, MB

SAMPLING INTERVAL (depth in ft below top of casing)
49.6 to 54.1

TOTAL VOLUME PURGED: 1.95 gal

SAMPLING PORT
53 6

PURGE RATE: variable (gal / min)
 PURGE METHOD: Double Valve Pump

WATER QUALITY:

Time	Purged Volume (gal)	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Drive/Vent Cycle (seconds)	Drive Pressure (psi)
1128	0	PUMP	DN					5/10	2.0
1130	0.02	13.18	1.440	0.54	6.95	-61.7	10.98	↓	↓
1140	0.25	13.36	1.403	0.37	7.23	-55.7	3.028	↓	↓
1150	0.30	13.55	1.394	0.35	7.36	-50.4	—	↓	↓
1202	0.50	13.65	1.390	0.32	7.40	-53.8	0.00	5/10	2.5
1210	0.75	13.75	1.380	0.30	7.49	-61.8	2.06		
1215	1.00	13.82	1.385	0.31	7.52	-78.4	2.59		
1220	1.15	13.91	1.383	0.30	7.55	-74.7	4.06		
1225	1.20	14.05	1.382	0.31	7.58	-67.8	2.19		
1230	1.21	14.19	1.381	0.32	7.60	-69.5	1.83		
1235	1.23	14.30	1.379	0.34	7.62	-63.3	2.02		
1240	1.25	14.39	1.378	0.35	7.63	-60.8	2.36		
1245	1.30	14.51	1.377	0.35	7.64	-58.6	1.97		
1252	1.35	14.61	1.374	0.38	7.66	-63.7	1.77		
1257	1.40	14.66	1.373	0.40	7.67	-69.9	0.00		
1302	1.45	14.61	1.376	0.41	7.67	-73.4	1.32		
1307	1.50	14.62	1.376	0.43	7.68	-78.0	1.17		
1312	1.55	14.74	1.375	0.44	7.68	-77.5	0.82		
1317	1.60	14.76	1.377	0.46	7.69	-76.8	1.16		
1322	1.65	14.74	1.379	0.47	7.69	-77.3	1.70		
1327	1.70	14.70	1.380	0.49	7.69	-77.5	1.04		
1332	1.75	14.69	1.380	0.50	7.69	-77.0	0.98		
1337	1.80	14.72	1.381	0.51	7.70	-76.4	0.96		
1341	START SAMPLE COLLECTION								
1527	END SAMPLE COLLECTION								

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde turbidity meter	2 200701254

NOTES AND OBSERVATIONS:

WELL ID: MW 02 - 71

SAMPLE ID: 013

GZA GeoEnvironmental of New York Waterloo Sampling Data Sheet

CLIENT: Entergy - IPEC
 SITE: Buchanan, NY
 WEATHER: Cloudy, 50s

PROJECT NO: 01.0017869.92
 DATE: 4/13/10
 SAMPLER(S): CB, MB

SAMPLING INTERVAL (depth in ft below top of casing)
61.1 to 82.6

TOTAL VOLUME PURGED: 3.90 gal

SAMPLING PORT
71 5

PURGE RATE: variable (gal / min)
 PURGE METHOD: Double Valve Pump

WATER QUALITY:

Time	Purged Volume (gal)	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Drive/Vent Cycle (seconds)	Drive Pressure (psi)
1128	0	PUMP	ON					5/6	20
1130	0.02	13.09	1.341	2.94	6.85	12.5	11.57		
1140	0.25	13.43	1.372	0.49	7.33	0.0	3.64		
1150	0.5	13.73	1.389	0.35	7.40	-15.4	4.69		
1202	1.0	13.84	1.394	0.31	7.43	-27.7	1.14	5/6	25
1210	1.25	14.03	1.401	0.35	7.44	-40.0	5.60		
1215	1.50	14.07	1.404	0.30	7.45	-46.7	9.06		
1220	1.75	14.23	1.405	0.32	7.45	-52.7	1.39		
1225	2.00	14.33	1.408	0.33	7.45	-56.7	2.46		
1230	2.25	14.34	1.412	0.30	7.46	-62.1	2.64		
1235	2.4	14.43	1.411	0.30	7.45	-66.9	2.87		
1240	2.5	14.52	1.413	0.31	7.45	-71.2	1.21		
1245	2.6	14.54	1.415	0.31	7.45	-76.8	0.89		
1252	2.75	14.59	1.415	0.30	7.46	-83.7	0.22		
1257	3.00	14.56	1.417	0.28	7.46	-88.6	0.00		
1302	3.5	14.57	1.417	0.27	7.45	-90.3	0.00		
1307	3.75	14.60	1.417	0.27	7.45	-97.8	0.00		
1311	START SAMPLE COLLECTION								
1345	END SAMPLE COLLECTION: 2L IPEC								
	2L DEC								
	0.5L IPEC								

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde turbidity meter	3 200701254

NOTES AND OBSERVATIONS:

GZA GeoEnvironmental of New York Modified Traditional Purge Sampling Data Sheet

WELL ID: MW-46
SAMPLE ID: 020

CLIENT: Entergy - IPEC
SITE: Buchanan, NY
WEATHER: SUNNY, 60s

PROJECT NO: 01.0017869.92
DATE: 4/2/10
SAMPLER(S): CB/MB

WATER COLUMN HEIGHT (ft) Well Diameter: 4 in

29.7 - 4.91 = 24.79
DTB DTW Water Column Height

Diameter	Multipliers
1	0.041
2	0.163
4	0.653

GALLONS OF WATER PER WELL VOLUME:

Water Column Height 24.79 x 0.653 = 16.188 gal
Multiplier Well Volume

16.188 x 1.5 = 24.28 gal
Designed Purge Volume

TOTAL VOLUME PURGED: 24.65 gal

WATER QUALITY: DTW = 4.91 Transducer Actual Depth 23.672 TRANSDUCER READING SURFACE: 12.888

Time	Volume Purged (gal)	DTW or Actual Depth	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Drive/Vent Cycle (seconds)	Drive Pressure (psi)	Notes
0852	0	23.651							N/A	N/A	
0856	0.05	22.721	16.30	0.727	2.19	7.57	53.6				
0906	3.60	20.183	16.96	0.678	0.92	7.67	9.4	21.98			
0916	6.25	18.519	17.09	0.676	0.65	7.68	-51	16.48			
0930	7.25	15.665	17.19	0.676	0.47	7.68	-32.3	8.93			
0940	8.50	13.726	17.26	0.671	0.59	7.69	-49.6	6.76			
0950	10.25	11.938	17.30	0.681	0.50	7.69	-52.9	8.35			
1005	13.25	9.777	17.37	0.727	1.29	7.71	-43.4	10.58			
1020	15.0	7.772	17.47	0.829	2.33	7.74	-26.5	8.38			
1035	18.75	5.982	17.56	0.927	3.27	7.76	-15.4	20.44			
1050	20.5	4.601	17.50	1.020	4.09	7.79	-11.1	31.11			
1105	22.5	3.467	17.51	1.075	4.72	7.80	2.3	37.33			
1115	23.75	2.803	17.56	1.098	4.79	7.80	0.5	44.46			
1121	24.40	3.198	17.61	1.124	0.07	7.80	1.3	67.32			
1123	START SAMPLE COLLECTION										
1129	END SAMPLE COLLECTION: 0.5L IPEC										
1132	END SAMPLE COLLECTION: 2L IPEC										

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde	4
turbidity meter	200701254

NOTES AND OBSERVATIONS:

Depth and Depth to Water (DTW) measurements are given in feet from top of casing.
Groundwater Elevation measurements are given in feet msl.

GZA GeoEnvironmental of New York Modified Traditional Purge Sampling Data Sheet

WELL ID: u3-4Dn
 SAMPLE ID: 024
 page 1 of 2

CLIENT: Entergy - IPEC
 SITE: Buchanan, NY
 WEATHER: M. Sunny 60's

PROJECT NO: 01.0017869.92
 DATE: 4/12/10
 SAMPLER(S): MB, CB

WATER COLUMN HEIGHT (ft) Well Diameter: 4 in

$$\frac{27.25}{\text{DTB}} - \frac{10.55}{\text{DTW}} = \frac{16.70}{\text{Water Column Height}} \text{ ft}$$

Diameter	Multipliers
1	0.041
2	0.163
4	0.653

GALLONS OF WATER PER WELL VOLUME:

Water Column Height 16.70 x 0.053 Multiplier = 10.91 Well Volume gal

10.91 x 1.5 = 16.36 gal
 Designed Purge Volume

TOTAL VOLUME PURGED: _____ gal

WATER QUALITY: DTW = 10.55 Transducer Actual Depth = 50.819 Transd. reading 3983

Time	Volume Purged (gal)	DTW or Actual Depth	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Notes
1001	0	50.819	PUMP ON						
1005	0.2+0.0	-	25.40	1.492	4.32	7.46	140.1	-	
1008	0.3+0.3	-	27.16	1.362	4.33	7.33	105.6	8.23	
1015	0.6+0.8	-	27.21	1.328	5.13	7.62	57.6	4.98	
1019	0.7+1.0	-	26.68	1.328	5.18	7.80	35.9	6.09	
1023	0.8+1.1	-	26.67	1.328	5.22	7.85	32.6	7.47	
1028	0.9+1.3	-	27.21	1.326	5.35	7.91	30.4	7.98	
1032	1.0+1.6	-	27.84	1.330	5.26	8.00	30.8	7.74	
1037	3.1	-	28.63	1.332	5.18	8.25	30.2	8.33	
1040	3.7	-	28.62	1.332	5.19	8.30	30.5	3.05	
1043	4.0	-	28.58	1.331	5.28	8.36	30.3	3.68	
1046	0.2+4.4	-	28.55	1.330	5.37	8.41	30.1	4.11	
1050	0.7+4.8	-	28.59	1.335	5.10	8.44	26.1	4.89	
1054	1.2+5.3	-	28.33	1.334	5.02	8.44	28.3	5.98	
1059	1.8+5.8	-	28.37	1.332	5.19	8.46	30.8	6.21	
1102	2+6.0	-	28.11	1.345	5.10	8.46	34.6	7.36	

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde	5
turbidity meter	200704293

NOTES AND OBSERVATIONS:

Depth and Depth to Water (DTW) measurements are given in feet from top of casing.
 Groundwater Elevation measurements are given in feet msl.

GZA GeoEnvironmental of New York Modified Traditional Purge Sampling Data Sheet

WELL ID: U3-4Dn
SAMPLE ID: 024
page 2 of 2

CLIENT: Entergy - IPEC
SITE: Buchanan, NY
WEATHER: M Sunny 60's

PROJECT NO: 01.0017869.92
DATE: 4/12/10
SAMPLER(S): MB CB

WATER COLUMN HEIGHT (ft) Well Diameter: 4 in

$$\frac{27.25}{\text{DTB}} - \frac{10.55}{\text{DTW}} = \frac{16.70}{\text{Water Column Height}} \text{ ft}$$

Diameter	Multipliers
1	0.041
2	0.163
4	0.653

GALLONS OF WATER PER WELL VOLUME:

$$\text{Water Column Height } \underline{16.70} \times \frac{0.653}{\text{Multiplier}} = \frac{10.91}{\text{Well Volume}} \text{ gal}$$

$$\underline{10.91} \times 1.5 = \underline{16.36} \text{ gal}$$

Designed Purge Volume

TOTAL VOLUME PURGED: _____ gal

WATER QUALITY: DTW = _____ Transducer Actual Depth _____

Time	Volume Purged (gal)	DTW or Actual Depth	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Drive/Vent Cycle (seconds)	Drive Pressure (psi)	Notes
1105	8.2	—	27.92	1.357	5.05	8.47	37.0	8.49			
1109	8.5	—	27.57	1.397	4.17	8.48	37.9	8.21			
1111	8.7	—	well dry, let well recharge before sampling.								
1111			pump off								
1142			pump on								
1142			start sample collection								
1149			pump off. let recharge more								
1244			continue sample collection								
1249			sample completed : 2 L IPEC								
1251			"	"							: 0.5 L IPEC

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde turbidity meter	5 200704293

NOTES AND OBSERVATIONS:
Depth and Depth to Water (DTW) measurements are given in feet from top of casing.
Groundwater Elevation measurements are given in feet msl.

GZA GeoEnvironmental of New York Low-Flow Sampling Data Sheet

WELL ID: MW-66-36
SAMPLE ID: 012

CLIENT: Entergy - IPEC
SITE: Buchanan, NY
WEATHER: Showers, 50's

PROJECT NO: 01.0017869.92
DATE: 4/1/10
SAMPLER(S): M. BRITOS
PUMP DEPTH: _____ ft

WATER QUALITY: DTW = 10.95 Transducer Actual Depth = 13.543 *Transd. reading = 2.463*

Time	DTW or Actual Depth	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Flow Rate (gal/hr)	Notes
10.58	13.543								
1119	13.370		PUMP	ON				0.1	
1130	13.334	13.34	1.250	11.01	7.37	-23.5	-	↓	
1145	13.248	13.34	2.415	2.98	7.24	7.0	-		
1156	13.165	13.28	2.402	2.45	7.16	13.9			
1205	13.130	13.23	2.397	2.20	7.19	30.8	8.68		
1210	13.081	13.21	2.394	2.17	7.21	29.6	8.64		0.10
1215	13.058	13.19	2.391	2.15	7.21	31.2	8.51	↓	
1220		START SAMPLE COLLECTION							
1231	12.978								
1242	12.902								
1300	12.836								
1348		increase rate to 0.3 gph							
1517		sample completed : 2 L IPEC							
1548		" " : 0.5 L IPEC							
		pump off							

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde	4
flow meter	3
turbidity meter	200704293

NOTES AND OBSERVATIONS: Total volume purged 0.25 gal
 Depth and Depth to Water (DTW) measurements are given in feet from top of casing.
 Groundwater Elevation measurements are given in feet msl.
*Very low purge rate (draining 0.1 g/h) and water level continues to drop. Tide influenced well.
 Add 0.4 L of water to flute liner.*

WELL ID: MW 51-189

SAMPLE ID: 013

GZA GeoEnvironmental of New York Waterloo Sampling Data Sheet

CLIENT: Entergy - IPEC
 SITE: Buchanan, NY
 WEATHER: M. Sunny 80's

PROJECT NO: 01.0017869.92
 DATE: 4/8/10
 SAMPLER(S): M. BRITOS

SAMPLING INTERVAL (depth in ft below top of casing)
184.2 to 197.8

TOTAL VOLUME PURGED: 1.85 gal

SAMPLING PORT
189

PURGE RATE: variable (gal / min)

PURGE METHOD: Double Valve Pump

WATER QUALITY:

Time	Purged Volume (gal)	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Drive/Vent Cycle (seconds)	Drive Pressure (psi)	
0947	0	PUMP ON						5.6/5.6	48	
0955	0.1	13.67	1.569	1.40	8.09	-192.3	—	↓	↓	
1002	0.3	13.78	1.540	0.56	8.25	-219.3	—			
1012	0.7	13.88	1.535	0.36	8.32	-236.1	7.87			
1020	0.85	13.81	1.533	0.30	8.16	-244.3	9.04			
1028	1.0	13.83	1.529	0.23	8.15	-249.6	11.31			
1035	1.2	13.86	1.529	0.21	8.16	-255.1	5.74			
1045	1.5	13.84	1.525	0.20	8.12	-253.4	5.69			
1053	1.7	13.81	1.524	0.19	8.14	-258.1	5.66			
1055		PUMP OFF								
1058		START SAMPLE COLLECTION								
1116		SAMPLE COMPLETED				2 L IPEC				
1120		" "				0.5 L IPEC				
1120		PUMP OFF								

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde turbidity meter	<u>6</u> 200704293

NOTES AND OBSERVATIONS:

WELL ID: MW 51.163

SAMPLE ID: 013

GZA GeoEnvironmental of New York Waterloo Sampling Data Sheet

CLIENT: Energy - IPEC
 SITE: Buchanan, NY
 WEATHER: M. Sunny 80's

PROJECT NO: 01.0017869.92
 DATE: 4/8/10
 SAMPLER(S): M. BRITOS

SAMPLING INTERVAL (depth in ft below top of casing)
154.7 to 166.2

TOTAL VOLUME PURGED: 1.30 gal

SAMPLING PORT
163 2

PURGE RATE: variable (gal / min)
 PURGE METHOD: Double Valve Pump

WATER QUALITY:

Time	Purged Volume (gal)	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Drive/Vent Cycle (seconds)	Drive Pressure (psi)
0947	0	PUMP	ON					5.6/5.6	48
0955	0.1	13.83	2.033	3.01	7.82	-59.2	—	↓	↓
1002	0.3	14.32	2.003	1.90	7.80	-54.7	—		
1012	0.4	14.46	2.012	1.60	7.66	-38.9	8.82		
1020	0.5	14.44	2.015	1.57	7.40	-32.0	8.30		
1028	0.7	14.40	2.019	1.40	7.30	-26.1	8.50		
1035	0.85	14.44	2.026	1.30	7.30	-24.0	8.65		
1045	0.95	14.46	2.037	1.19	7.29	-23.8	8.67		
1053	1.05	14.48	2.040	1.17	7.29	-24.0	8.69		
1059	1.15	14.50	2.043	1.17	7.29	-24.2	8.70		
1100		PUMP	OFF						
1102		START	SAMPLE COLLECTION						
1131		SAMPLE	COMPLETED : 2 L IPEC						
1142		"	"			0.5 L IPEC			
1142		PUMP	OFF						

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde turbidity meter	1 200704293

NOTES AND OBSERVATIONS:

WELL ID: MW 51-104

SAMPLE ID: 013

GZA GeoEnvironmental of New York Waterloo Sampling Data Sheet

CLIENT: Entergy - IPEC
 SITE: Buchanan, NY
 WEATHER: M. Sunny 80's

PROJECT NO: 01.0017869.92
 DATE: 4/8/10
 SAMPLER(S): M. BRITOS

SAMPLING INTERVAL (depth in ft below top of casing)
130.2 to 143.7

TOTAL VOLUME PURGED: 3.15 gal

SAMPLING PORT
104

4

PURGE RATE: variable (gal / min)

PURGE METHOD: Double Valve Pump

WATER QUALITY:

Time	Purged Volume (gal)	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Drive/Vent Cycle (seconds)	Drive Pressure (psi)
0947	0	PUMP	ON					5.6/5.6	48
0955	0.6	13.05	2.713	1.85	6.88	-39.2	—	↓	↓
1002	1.2	13.14	2.732	1.54	6.91	-39.5	—		
1012	1.9	13.15	2.733	1.32	6.92	-49.6	9.59		
1020	2.3	13.05	2.734	1.30	6.93	-54.1	7.71		
1028	2.8	13.10	2.736	1.29	6.93	-56.0	7.65		
1035	3.0	13.08	2.740	1.28	6.93	-57.1	7.73		
1036		PUMP	OFF						
1038		START SAMPLE COLLECTION							
1042		SAMPLE COMPLETED			: 2 L	IPEC			
1044		"	"	"	: 0.5L	IPEC			
1044		PUMP	OFF						

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde	3
turbidity meter	200704293

NOTES AND OBSERVATIONS:

WELL ID: MW 51-79

SAMPLE ID: 015

GZA GeoEnvironmental of New York Waterloo Sampling Data Sheet

CLIENT: Entergy - IPEC
 SITE: Buchanan, NY
 WEATHER: M. Sunny 80's

PROJECT NO: 01.0017869.92
 DATE: 4/8/10
 SAMPLER(S): M. BRITOS

SAMPLING INTERVAL (depth in ft below top of casing)
63.2 to 81.2

TOTAL VOLUME PURGED: 1.55 gal

SAMPLING PORT
79

6

PURGE RATE: variable (gal / min)

PURGE METHOD: Double Valve Pump

WATER QUALITY:

Time	Purged Volume (gal)	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Drive/Vent Cycle (seconds)	Drive Pressure (psi)
1250	0	PUMP ON							
1300	0.15	15.21	2.733	1.37	6.78	-184.2	-	6.5/8.4	25
1309	0.30	15.20	2.720	1.50	6.94	-174.0	6.79		
1316	0.55	15.08	2.724	1.49	6.99	-166.9	6.82		
1321	0.70	14.99	2.723	1.50	6.99	-163.5	7.13		
1327	0.85	15.10	2.717	1.49	6.99	-160.7	7.15		
1337	1.05	15.00	2.724	1.50	6.99	-156.0	7.19		
1342	1.15	14.98	2.725	1.48	7.00	-155.9	7.22		
1349	1.40	14.94	2.728	1.48	6.98	-153.6	7.17		
1351		PUMP OFF							
1352		START SAMPLE COLLECTION							
1421		SAMPLE COMPLETED							
1427		"							
1427		PUMP OFF							

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde turbidity meter	3 200704293

NOTES AND OBSERVATIONS:

WELL ID: MW 51-40

SAMPLE ID: 015

GZA GeoEnvironmental of New York Waterloo Sampling Data Sheet

CLIENT: Entergy - IPEC
SITE: Buchanan, NY
WEATHER: M. Sunny 80's

PROJECT NO: 01.0017869.92
DATE: 4/8/10
SAMPLER(S): M. BRITOS

SAMPLING INTERVAL (depth in ft below top of casing)
29.7 to 44.2

TOTAL VOLUME PURGED: 2.45 gal

SAMPLING PORT
40 7

PURGE RATE: variable (gal / min)
PURGE METHOD: Double Valve Pump

WATER QUALITY:

Time	Purged Volume (gal)	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Drive/Vent Cycle (seconds)	Drive Pressure (psi)
1250	0	PUMP ON							
1300	0.5	14.67	2.449	3.92	7.05	-17.0	—	6.5/8.4	25
1309	0.8	14.59	2.444	3.98	7.06	1.9	6.89	↓	↓
1316	1.1	14.62	2.436	3.95	7.06	13.8	6.59		
1321	1.4	14.53	2.435	3.92	7.05	18.2	5.98		
1327	1.6	14.49	2.433	3.95	7.05	19.9	5.59		
1337	2.0	14.49	2.436	3.98	7.05	20.8	5.62		
1342	2.3	14.47	2.434	3.94	7.04	21.2	5.56		
1344		PUMP OFF							
1347		START SAMPLE COLLECTION							
1358		SAMPLE COMPLETED : 2 L IPEC							
1401		" : 0.5 L IPEC							
1401		PUMP OFF							

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde	2
turbidity meter	200704293

NOTES AND OBSERVATIONS:



APPENDIX E: POST-Q2 2010 MID-QUARTER SAMPLING DATA SHEETS

GZA GeoEnvironmental of New York Modified Traditional Purge Sampling Data Sheet

WELL ID: MW-44-67
SAMPLE ID: 016

CLIENT: Entergy - IPEC
SITE: Buchanan, NY
WEATHER: Sun + clouds 70's

PROJECT NO: 01.0017869.92
DATE: 6/10
SAMPLER(S): M. Britos

WATER COLUMN HEIGHT (ft) Well Diameter: _____ in

67.00 - 59.60 = 7.40 ft

DTB DTW Water Column Height

Diameter	Multipliers
1	0.041
2	0.163
4	0.653

GALLONS OF WATER PER WELL VOLUME:

Water Column Height 7.40 x 0.163 = 1.20 gal

Multiplier Well Volume

1.20 x 1.5 = 1.81 gal

Designed Purge Volume

TOTAL VOLUME PURGED: 1.55 gal

WATER QUALITY: DTW = _____ Transducer Actual Depth _____

Time	Volume Purged (gal)	DTW or Actual Depth	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Drive/Vent Cycle (seconds)	Drive Pressure (psi)	Notes
1030	0	<u>59.60</u>									PUMP ON
1035	0.01	60.09	18.77	0.950	7.96	7.80	35.5	-	8/8	60	
1040	0.05	60.53	18.09	1.619	5.20	7.39	38.9	26.88	8/8	86	
1045	0.10	60.92	17.83	1.594	5.72	7.35	32.2	19.67	10/6	88	
1051	0.20	61.46	17.54	1.582	5.85	7.30	32.6	17.91			
1059	0.40	62.20	17.28	1.579	6.14	7.30	38.1	34.21	↓	↓	
1105	0.60	63.08	17.67	1.576	6.24	7.31	43.0	56.92	14/6	88	
1115	0.90	-	17.45	1.576	6.75	7.31	47.8	52.24			
1121	1.10	-	17.31	1.576	6.61	7.31	51.2	78.96	10/9	88	
1129	1.30	-	17.76	1.580	6.18	7.31	52.7	83.32			
1136	1.40		17.68	1.581	6.22	7.31	53.1	94.81	↓	↓	
1137	1.55										WELL DRY. LET RECHARGE BEFORE SAMPLE
1440											START SAMPLE COLLECTION
1530											SAMPLE COMPLETED : 2 L IPEC 0.5 L IPEC
1530											PUMP OFF

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde	5
turbidity meter	200704293

NOTES AND OBSERVATIONS:

Depth and Depth to Water (DTW) measurements are given in feet from top of casing.
Groundwater Elevation measurements are given in feet msl.

GZA GeoEnvironmental of New York Modified Traditional Purge Sampling Data Sheet

WELL ID: MW-44102
SAMPLE ID: 017

CLIENT: Entergy - IPEC
SITE: Buchanan, NY
WEATHER: Sun + clouds 70's

PROJECT NO: 01.0017869.92
DATE: 6/10/10
SAMPLER(S): M. BRITOS

WATER COLUMN HEIGHT (ft) Well Diameter: _____ in

$$\frac{102.00}{\text{DTB}} - \frac{68.00}{\text{DTW}} = \frac{34.00}{\text{Water Column Height}} \text{ ft}$$

Diameter	Multipliers
1	0.041
2	0.163
4	0.653

GALLONS OF WATER PER WELL VOLUME:

Water Column Height 34.00 x $\frac{0.041}{\text{Multiplier}}$ = 1.394 gal
1.394 x 1.5 = 2.09 gal
DESIGNED PURGE VOLUME

TOTAL VOLUME PURGED: 2.25 gal

WATER QUALITY: DTW = _____ Transducer Actual Depth _____

Time	Volume Purged (gal)	DTW or Actual Depth	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Notes
1242	0		PUMP ON						
1245	0.05	—	18.13	0.799	9.07	7.29	75.4	401.6	
1249	0.40	—	17.38	0.984	7.57	7.32	87.2	711.3	
1252	0.60	—	17.39	1.101	7.36	7.32	90.2	926.7	
1256	1.0	—	17.38	1.058	6.64	7.32	94.1	686.7	
1300	1.4	—	17.42	1.053	6.58	7.33	95.6	818.2	
1304	1.8	—	17.64	1.058	6.65	7.34	96.2	984.6	
1307	2.1	—	17.78	1.055	6.71	7.35	96.8	999.9	
1307			PUMP OFF						
1308			START SAMPLE COLLECTION						
1313			SAMPLE COMPLETED : 2 L IPEC						
			0.5 L IPEC						
1313			PUMP OFF						

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde	4
turbidity meter	200704293

NOTES AND OBSERVATIONS:

Depth and Depth to Water (DTW) measurements are given in feet from top of casing.
Groundwater Elevation measurements are given in feet msl.

WELL ID: MW 32-149

SAMPLE ID: 018

GZA GeoEnvironmental of New York Waterloo Sampling Data Sheet

CLIENT: Entergy - IPEC
 SITE: Buchanan, NY
 WEATHER: Cloudy, showers, 70's

PROJECT NO: 01.0017869.92
 DATE: 6/9/10
 SAMPLER(S): M. BRITOS

SAMPLING INTERVAL (depth in ft below top of casing)
147.3 to 156.8

TOTAL VOLUME PURGED: 0.75 gal

SAMPLING PORT
149 3

PURGE RATE: variable (gal / min)
 PURGE METHOD: Double Valve Pump

WATER QUALITY:

Time	Purged Volume (gal)	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Drive/Vent Cycle (seconds)	Drive Pressure (psi)
1050	0	PUMP ON						8/8	49
1100	0.01	19.18	1.514	2.02	6.68	-85.6	—		
1110	0.05	19.13	1.503	1.02	6.76	-146.7			
1115	0.1	19.01	1.510	0.99	6.79	-155.4	9.46		
1120	0.15	19.06	1.518	0.89	6.89	-156.7	9.20		
1130	0.20	19.11	1.552	0.85	6.93	-157.2	9.01		
1135	0.25	19.12	1.560	0.67	6.97	-158.4	8.83		
1142	0.30	19.13	1.570	0.50	7.01	-154.6	8.76		
1150	0.35	19.08	1.583	0.41	7.05	-145.5	8.60		
1200	0.40	19.07	1.590	0.39	7.07	-148.9	8.51		
1205	0.50	19.08	1.593	0.33	7.08	-150.4	8.45		
1210	0.55	19.11	1.596	0.32	7.09	-151.9	8.47		
1215	0.60	19.12	1.596	0.31	7.09	-152.7	8.43	↓	↓
1216		PUMP OFF							
1217		START SAMPLE COLLECTION							
1252		SAMPLE COMPLETED : 2 L IPEC (Mid Quarter)							
1252		PUMP OFF							

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde	2
turbidity meter	200704293

NOTES AND OBSERVATIONS: Mid Quarter Sample.

WELL ID: MW 32 - 59

SAMPLE ID: 018

GZA GeoEnvironmental of New York Waterloo Sampling Data Sheet

CLIENT: Entergy - IPEC

PROJECT NO: 01.0017869.92

SITE: Buchanan, NY

DATE: 6/9/10

WEATHER: Cloudy, Showers, 70's

SAMPLER(S): M. BRITOS

SAMPLING INTERVAL (depth in ft below top of casing)

28.3 to 61.3

TOTAL VOLUME PURGED:

1.0 gal

SAMPLING PORT

59

PURGE RATE: variable (gal / min)

PURGE METHOD: Double Valve Pump

6

WATER QUALITY:

Time	Purged Volume (gal)	Temp (°C)	Specific Conductivity (S/cm)	Dissolved Oxygen (g/l)	pH (SU)	ORP	Turbidity (NTU)	Drive/Vent Cycle (seconds)	Drive Pressure (psi)
1353	0	PUMP ON						8/7	25
1359	0.01	19.01	1.098	6.60	7.26	94.6	—	8/8	26
1405	0.1	19.06	0.960	5.82	7.29	73.5	2.17		
1413	0.3	19.12	0.874	6.47	7.30	65.3	1.76		
1423	0.5	19.18	0.831	6.61	7.33	65.3	1.68		
1428	0.65	19.21	0.826	6.60	7.34	65.6	1.74		
1433	0.80	19.20	0.822	6.59	7.35	66.5	1.67		
1435		PUMP OFF							
1437		START SAMPLE COLLECTION							
1453		SAMPLE COMPLETED : 2 L IPEC (Mid Quarter)							
1453		PUMP OFF							

Equipment Used	Equipment Identification #
YSI 556 MPS Reader and 5563 Sonde	5
turbidity meter	200704293

NOTES AND OBSERVATIONS:



APPENDIX F: DOSE CALCULATIONS



Facility Groundwater Flux Calculation

Site Indian Point
Job No. 17869.02

Prepared By: JAS
Reviewed By: mb

Parameter Values:

year
2010

Totals						
Total Catchment Zone (ft ²)		Total Improved Zone (ft ²)		Recharge (ft/yr)	Precipitation (ft/yr)	
3,969,765		1,432,972		0.83	3.18	
Surface Area						
Northern Clean Zone Improved (ft ²)	Unit 2 North Improved Zone (ft ²)	Unit 1/2 Improved Zone (ft ²)	Unit 3 North Improved Zone (ft ²)	Unit 3 South Improved Zone (ft ²)	Southern Clean Improved Zone (ft ²)	
0	148,214	433,904	316,210	321,290	213,354	
Northern Clean Unimproved Zone (ft ²)	Unit 2 North Unimproved Zone (ft ²)	Unit 1/2 Unimproved Zone (ft ²)	Unit 3 North Unimproved Zone (ft ²)	Unit 3 South Unimproved Zone (ft ²)	Southern Clean Zone Unimproved (ft ²)	
106,429	204,317	438,221	323,116	268,862	585,600	
Discounted Area Within Zone	Discounted Area Within Zone	Discounted Area Within Zone	Discounted Area Within Zone	Discounted Area Within Zone	Discounted Area Within Zone	
50,265	0	291,166	106,718	17,730	144,347	
Northern Clean Zone Catchment (ft ²)	Unit 2 North Catchment Zone (ft ²)	Unit 1/2 Catchment Zone (ft ²)	Unit 3 North Catchment Zone (ft ²)	Unit 3 South Zone (ft ²)	Southern Clean Zone (ft ²)	
156,694	352,531	1,183,311	748,044	607,882	943,302	
Activity (pCi/L)						
Groundwater						
	Northern Clean Zone Catchment	Unit 2 North	Unit 1/2	Unit 3 North	Unit 3 South Zone	Southern Clean Zone
Upper Zone Before Canal	150	337	4,088	399	711	184
Lower Zone Before Canal	150	239	3,077	1,326	536	183
	Northern Clean Zone	Unit 2 North	Unit 1/2	Unit 3 North	Unit 3 South Zone	Southern Clean Zone
Upper Zone After Canal	150	256	3,290	322	711	184
Lower Zone After Canal	150	492	968	521	536	183
Stormwater Discharging to Canal (pCi/L)						
Storm Water for Northern Clean Zone	Storm Water for Unit 2 North	Storm Water for Unit 1/2	Storm Water for Unit 3 North	Storm Water for Unit 3 South	Storm Water for Southern Clean Zone	
NA	1,831 Avg MH-4a	NA	0 Avg CB-14 and CB-34	1,119 Avg U3-CB-B8	377 Avg D1, C3, E6, & E10	
Stormwater Discharging to River (pCi/L)						
Storm Water for Northern Clean Zone	Storm Water for Unit 2 North	Storm Water for Unit 1/2	Storm Water for Unit 3 North	Storm Water for Unit 3 South	Storm Water for Southern Clean Zone	
NA	129 Avg. MH-1 and MH-12	0 Avg MH-14	0 Avg CB-15	NA	201 Avg E13, CB-C2	

Potential Water Received by Storm Drain System

=(Improved Area) x Precipitation

Northern Clean Area	Unit 2 North	Unit 1/2	Unit 3 North	Unit 3 South	Southern Clean Zone	Units
0	470,579	1,377,646	1,003,968	1,020,094	677,400	ft ³ /yr
0	1,289	3,774	2,751	2,795	1,324	ft ³ /day
0.00	6.70	19.61	14.29	14.52	9.64	GPM
0	13,325,316	39,010,581	28,429,198	28,885,854	19,181,845	L/Yr

The total amount of water available to be received by the storm system is computed as the combined area of buildings and paved areas in the catchment multiplied by the annual precipitation rate. Note this conservatively assumes that the amount of water lost to the atmosphere or other sinks after precipitation has fallen on paved or built up surfaces is zero.

Water Directly Recharged to Aquifer from Precipitation

=Unimproved Area x Recharge

Northern Clean Area	Unit 2 North	Unit 1/2	Unit 3 North	Unit 3 South	Southern Clean Zone	Units
87,857	168,664	361,752	266,732	221,946	483,413	ft ³ /yr
241	462	991	731	608	1,324	ft ³ /day
1.25	2.40	5.15	3.60	3.16	6.88	GPM
2,487,841	4,776,030	10,243,665	7,553,005	6,284,809	13,688,731	L/Yr

Note that this calculation reflects recharge to the aquifer in non-paved areas. The Recharge value listed above and used in this calculation reflects only that portion of precipitation that actually recharges the aquifer.



Facility Groundwater Flux Calculation

Site Indian Point
Job No. 17869.02

Prepared By: JAS
Reviewed By: mib

Water Recharged to Aquifer (Direct Recharge Plus Storm Water Leakage Minus Building Drain Removal)

$= (\text{Direct Recharge} + X\% \text{ Water Received by Storm System}) - (Y\% \times \text{Water Removed by Building Drains})$

Total Water Discharged to Aquifer

Upper and Lower Zone	[Northern Clean Area Catchment + (0% Storm Drain Water)] ¹	[Unit 2 North + (50% Storm Drain Water)]-[5gpm]	[Unit 1/2 Area Catchment + (30% Storm Drain Water)]-[7.5 gpm]	[Unit 3 North Area Catchment + (60% Storm Drain Water)]-[7.5gpm]	[Unit 3 South Area + (10% Storm Drain Water)]	[Southern Clean Zone Area + (40% Storm Drain Water)]	Units
		87,857	52,641	248,077	342,144	323,955	754,373
	241	144	680	937	886	2,067	ft ³ /day
	1.25	0.75	3.53	4.87	4.61	10.74	GPM
	2,487,841	1,490,627	7,024,746	9,868,431	9,173,395	21,361,469	L/Yr

¹ There are no improved surfaces in Northern Clean Zone.

Groundwater Discharged to Canal

$= \text{Water Recharged to Aquifer} \times X\% \text{ flowing to Canal}$

Upper and Lower Zone	Northern Clean Area Catchment x 0%	Unit 2 North x 15.2%	Unit 1/2 Area Catchment 24.2%	Unit 3 North Area Catchment x 22.9%	Unit 3 South Area x68.4%	Southern Clean Zone Area x 0%	Units
		0	8,001	60,035	78,351	221,585	0
	0	22	164	215	607	0	ft ³ /day
	0.00	0.11	0.85	1.12	3.15	0.00	GPM
	0	226,575	1,699,989	2,218,651	6,274,602	0	L/Yr

Groundwater Discharged to River

$= \text{Water Recharged to Aquifer} \times X\% \text{ flowing to River} \times Y\% \text{ Flowing in Appropriate Vertical Zone}$

Upper Zone	Northern Clean Area Catchment x 100% x 59.3%	Unit 2 North x 84.8% x 15.1%	Unit 1/2 Area Catchment x 75.8% x 11.7%	Unit 3 North Area Catchment x 77.1% x 47.9%	Unit 3 South Area x 31.6% x 31.3%	Southern Clean Zone Area x 100% x 55.2%	Units
		52,099	6,741	22,001	126,357	32,042	416,414
	143	18	60	346	88	1,141	ft ³ /day
	0.74	0.10	0.31	1.80	0.46	5.93	GPM
	1,475,290	190,872	622,997	3,578,025	907,322	11,781,531	L/Yr
Lower Zone	Northern Clean Area Catchment x 100% x 40.7%	Unit 2 North x 84.8% x 84.9%	Unit 1/2 Area Catchment 75.8% x 88.3%	Unit 3 North Area Catchment x 77.1% x 52.1%	Unit 3 South Area x 31.6% x 68.7%	Southern Clean Zone Area x 100% x 44.8%	Units
		35,758	37,899	166,041	137,436	70,328	337,959
	98	104	455	377	193	926	ft ³ /day
	0.51	0.54	2.36	1.96	1.00	4.81	GPM
	1,012,551	1,073,180	4,701,761	3,891,756	1,991,471	9,569,938	L/Yr

Water Remaining in Storm Drains and Discharged to Canal

$= \text{Storm Drain Water} \times X\% \text{ Not Leaking to Groundwater and Not Discharging to River}$

Northern Clean Area Catchment (0% Storm Drain Water)	Unit 2 North (45% Unit 2 North and 30% of Unit 1/2 Storm Drain Water). Plus 5 gpm (351k cf/yr) from U2 footing drain.	Unit 1/2 Area Catchment (0% Storm Drain Water)	Unit 3 North Area Catchment (3% Unit 3 North Storm Drain Water)	Unit 3 South Area (3% Unit 3 North and 42% Unit 3 South Storm Drain Water)	Southern Clean Zone Area (30% Unit 1/2, 27% Unit 3 North, 43% Unit 3 South, and 55% Southern Clean Zone Storm Drain Water)	Units
0	976,054	0	30,119	458,559	1,495,576	ft ³ /yr
0	2,674	0	83	1,256	4,087	ft ³ /day
0	13.89	0.00	0.43	6.53	21.29	GPM
0	27,640,118	0	852,876	12,984,935	42,349,990	L/Yr

Water Remaining in Storm Drains and Discharged to River

Northern Clean Area Catchment (0% Storm Drain Water)	Unit 2 North (5% Storm Drain Water)	Unit 1/2 Area Catchment (10% Storm Drain Water)	Unit 3 North Area Catchment (7% Storm Drain Water)	Unit 3 South Area (5% Storm Drain Water)	Southern Clean Zone Area (5% Storm Drain Water)	Units
0	23,529	137,765	70,278	51,005	33,870	ft ³ /yr
0	64	377	193	140	93	ft ³ /day
0	0.33	1.96	1.00	0.73	0.48	GPM
0	666,266	3,901,058	1,990,044	1,444,293	959,092	L/Yr



Facility Groundwater Flux Calculation

Site Indian Point
 Job No. 17869.92

Prepared By: JAS
 Reviewed By: mjb

Flux Calculations

Conceptual Model: Migration Pathway Summary

	Northern Clean Area	Unit 2 North	Unit 1/2	Unit 3 North	Unit 3 South	Southern Clean Zone
GW	100% Upper and Lower Zone To River	84.8% Upper Zone and Lower Zone Flow To River. 15.2% Upper Zone and Lower Zone Flow to Canal	75.8% Upper Zone and Lower Zone To River. 24.2% Upper Zone and Lower Zone to Canal	77.1% Upper Zone and Lower Zone To River. 22.9% Upper Zone and Lower Zone to Canal	31.8% Upper Zone and Lower Zone To River. 68.4% Upper Zone and Lower Zone to Canal	100% Upper and Lower Zone To River
SW	NA	To Canal (Storm Water Considered Clean; Estimated at 5.5 GPM) and To River (5% Storm Water)	To Canal (60% Storm Water) and To River (10% Storm Water)	To Canal (33% Storm Water) and To River (7% Storm Water)	To Canal (85% Storm Water) and To River (5% Storm Water)	To Canal (55% Storm Water) and To River (5% Storm Water)

Flux (pCi/Yr)

	North Clean Area	Unit 2 North	Unit 1/2	Unit 3 North	Unit 3 South	South Clean Zone	Total
GW to River-Upper Zone	2.21E+08	4.88E+07	2.05E+09	1.15E+09	6.45E+08	2.17E+09	6.28E+09
GW to River-Lower Zone	1.52E+08	5.28E+08	4.55E+09	2.03E+09	1.07E+09	1.75E+09	1.01E+10
GW to Canal	0.00E+00	7.64E+07	6.95E+09	8.84E+08	4.46E+09	0.00E+00	1.24E+10
SW to Canal	NA	5.06E+10	0.00E+00	0.00E+00	1.45E+10	1.60E+10	8.11E+10
SW to River	NA	8.61E+07	0.00E+00	0.00E+00	0.00E+00	1.93E+08	2.79E+08

Curies/Yr ==> 0.11

Notes:

The recharge rate used herein, 28% of precipitation (~10 in/yr), is within the range of values discussed in the USGS modeling report! The reported recharge ranged from 3.6 inches/year to 7.5 inches/year for a till to 20 inches per year for coarse grained glacially stratified deposits. A yearly rolling average precipitation value measured at the Facility meteorological station is also used in the computations. The catchment area was defined using an AutoCAD topo map for the Site and surrounding area. The catchment was defined by starting at the area marked "line of water grant" and tracking east, away from the River, to define portions of the land surface contributing water to the selected discharge zone. Calculations assume that run-off or overland flow in unimproved areas of the Site is negligible, there are no changes in storage and the Hudson River is a gaining stream.

1. USGS. Water Use, Ground-Water Recharge and Availability, and Quality of Water in the Greenwich Area, Fairfield County, Connecticut and Westchester County, New York, 2000-2002



APPENDIX G: UNIT 2 TRITIUM PLUME TREND ANALYSES

TABLE G1
MANN-KENDALL TREND EVALUATION SUMMARY
TRITIUM IN GROUNDWATER NEAR UNIT 2
INDIAN POINT ENERGY CENTER
BUCHANAN, NY

Well ID	Number of Data Points	Number of Times below MDC	Minimum Tritium Activity (pCi/L)	Maximum Tritium Activity (pCi/L)	Mann-Kendall Statistic (S)	Normalized Test Statistic (Z)	Probability	Trend at 95% Level of Significance
MW-30-69	36	0	7.36E+04	6.01E+05	-159	-2.15	0.984	decreasing
MW-30-84	23	0	3.78E+03	1.25E+04	35	0.90	0.815	no trend
MW-31-49	35	0	2.98E+02	4.84E+04	-3	-0.03	0.511	no trend
MW-31-63	23	0	5.00E+03	7.35E+04	64	1.66	0.952	increasing
MW-31-85	23	0	3.17E+02	2.25E+04	102	2.67	0.996	increasing
MW-32-59	22	0	4.13E+02	1.55E+05	31	0.85	0.801	no trend
MW-32-85	21	0	5.42E+03	1.26E+04	30	0.88	0.809	no trend
MW-32-149	18	0	1.99E+02	1.05E+04	-25	-0.91	0.818	no trend
MW-32-173	16	0	4.31E+02	5.89E+03	-38	-1.67	0.952	decreasing
MW-32-190	20	0	1.59E+03	1.13E+04	-124	-3.99	1.000	decreasing
MW-33	24	0	2.30E+04	2.64E+05	-121	-2.98	0.999	decreasing
MW-35	20	0	1.04E+03	1.19E+05	-88	-2.82	0.998	decreasing
MW-36-24	16	2	1.54E+02	3.42E+04	20	0.86	0.804	no trend
MW-36-41	11	0	6.11E+03	5.52E+04	-32	-2.41	0.992	decreasing
MW-36-52	16	0	5.97E+03	2.68E+04	-84	-3.74	1.000	decreasing
MW-37-22	18	0	2.26E+03	3.49E+04	-43	-1.59	0.944	no trend
MW-37-32	18	0	2.49E+03	3.01E+04	-55	-2.05	0.980	decreasing
MW-37-40	17	0	4.22E+03	1.70E+04	-100	-4.08	1.000	decreasing
MW-37-57	18	0	4.05E+03	4.48E+04	-93	-3.48	1.000	decreasing
MW-42-49	18	0	1.12E+03	7.22E+04	-41	-1.52	0.935	no trend
MW-42-78	13	0	3.46E+02	1.28E+03	-26	-1.53	0.936	no trend
MW-49-26	20	0	2.82E+03	1.54E+04	-158	-5.09	1.000	decreasing
MW-49-42	20	0	2.20E+03	1.13E+04	-148	-4.77	1.000	decreasing
MW-49-65	20	0	1.26E+03	5.76E+03	-129	-4.15	1.000	decreasing
MW-50-42	21	4	1.01E+02	9.75E+03	-42	-1.24	0.892	no trend
MW-50-66	25	0	2.08E+03	1.08E+04	-202	-4.69	1.000	decreasing
MW-53-82	15	0	4.54E+02	1.32E+04	-5	-0.20	0.578	no trend
MW-53-120	18	0	4.10E+03	9.61E+03	-93	-3.48	1.000	decreasing
MW-55-24	14	0	7.82E+02	3.08E+03	-14	-0.71	0.762	no trend
MW-55-35	13	0	8.53E+02	9.04E+03	-28	-1.65	0.950	decreasing
MW-55-54	14	0	5.47E+03	1.31E+04	-31	-1.64	0.950	no trend
MW-111	33	0	6.81E+03	5.78E+05	-219	-3.38	1.000	decreasing
DOWNGRADIENT WELLS								
MW-66-21	13	0	8.28E+01	3.57E+03	-18	-1.04	0.850	no trend
MW-66-36	12	0	3.05E+03	9.10E+03	-52	-3.50	1.000	decreasing
MW-67-39	11	0	2.55E+03	5.07E+03	-35	-2.65	0.996	decreasing
MW-67-105	12	0	1.54E+03	2.93E+03	-34	-2.26	0.988	decreasing
MW-67-173	12	0	6.73E+02	1.05E+03	-29	-1.92	0.973	decreasing
MW-67-219	11	0	9.22E+02	1.44E+03	-1	0.00	0.500	no trend
MW-67-276	11	0	6.79E+02	1.18E+03	0	0.00	0.500	no trend
MW-67-323	11	0	3.13E+02	1.29E+03	17	1.25	0.894	no trend
MW-67-340	11	0	3.69E+02	6.69E+02	31	2.34	0.990	increasing

Notes: Calculations based on Mann-Kendall trend evaluations as presented in U.S. EPA Practical Methods for Data Analysis, U.S. EPA QA/G-9 QA00 UPDATE, July 2000, Section 4.3.4

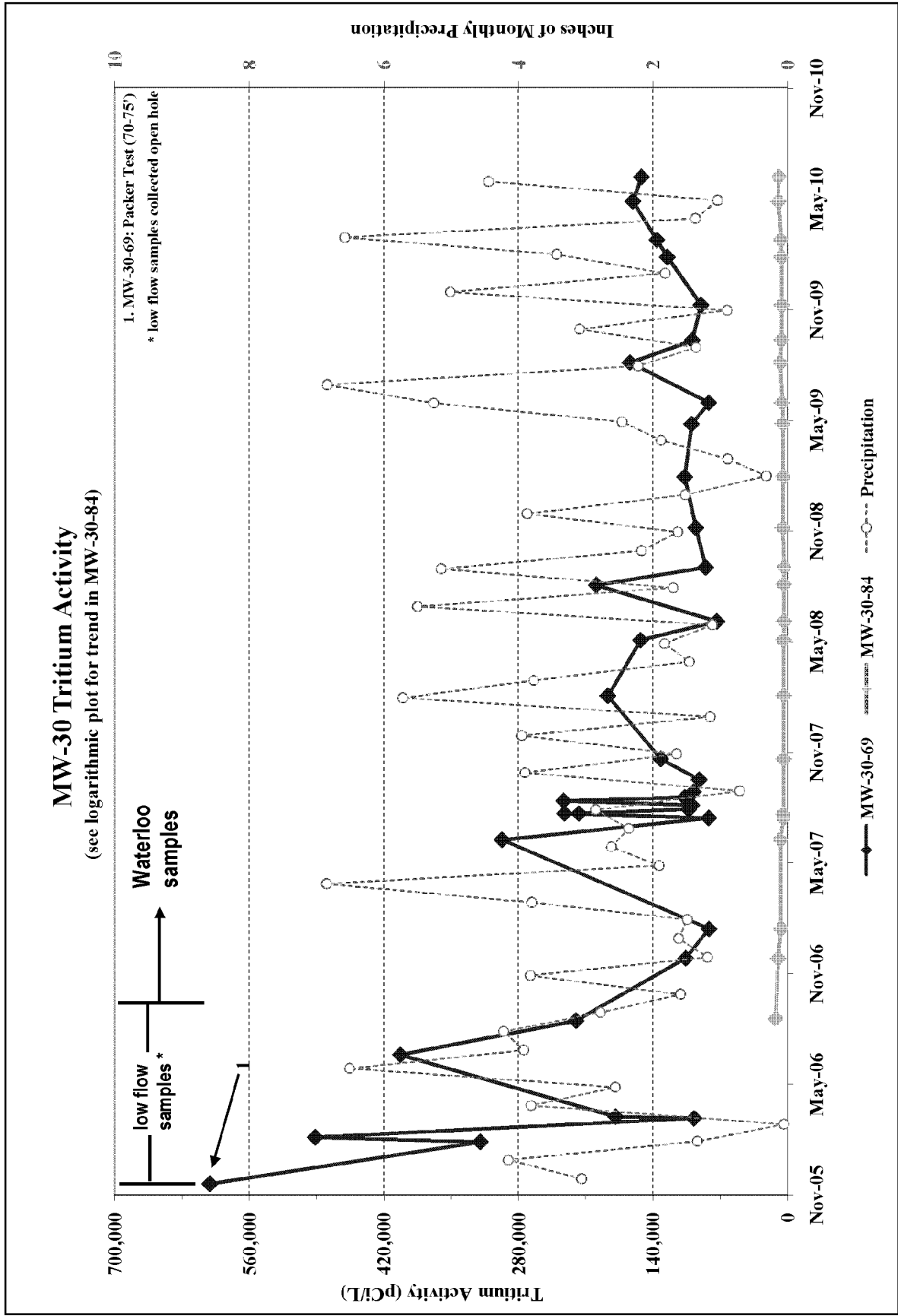


FIGURE G1

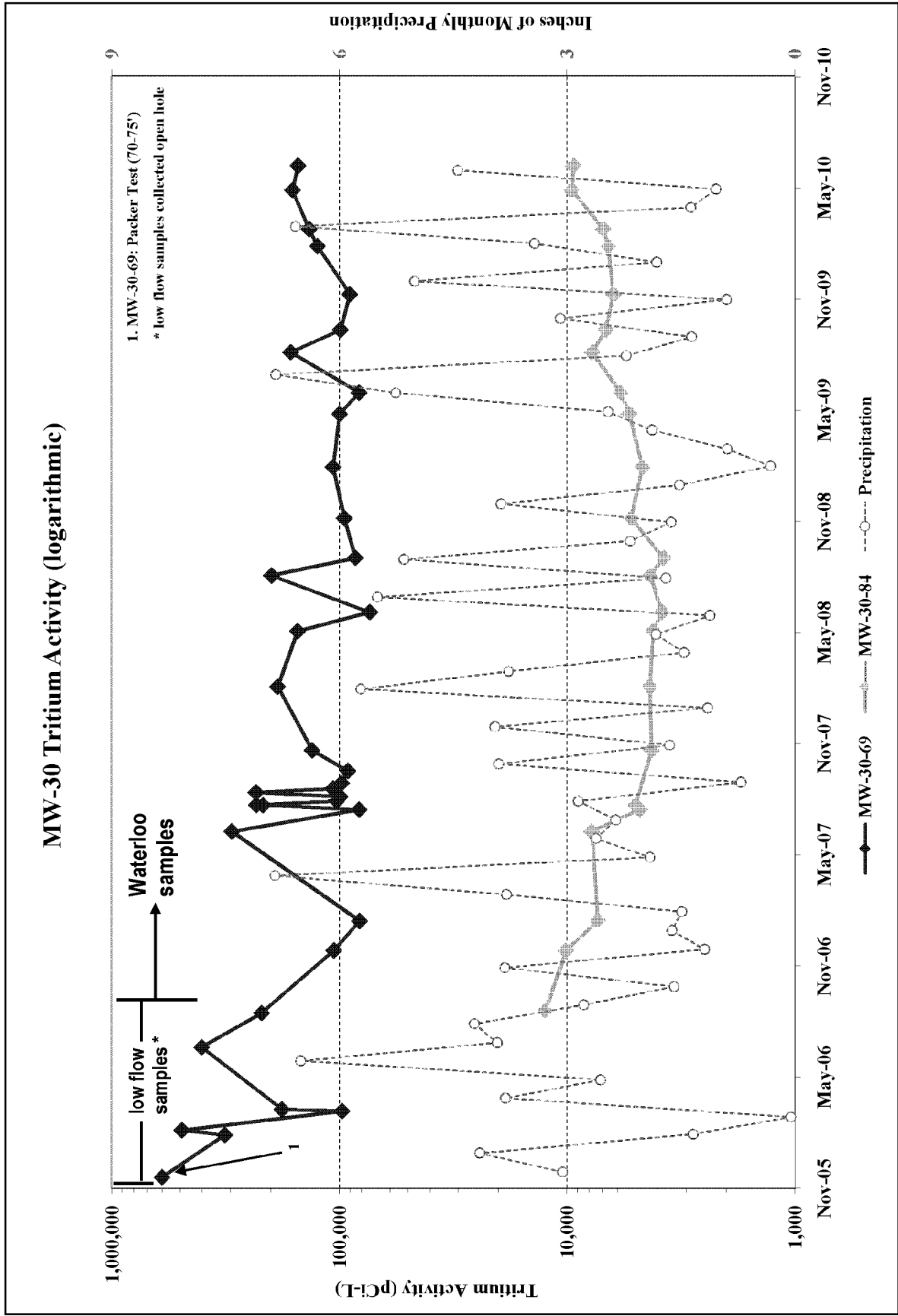


FIGURE G1a

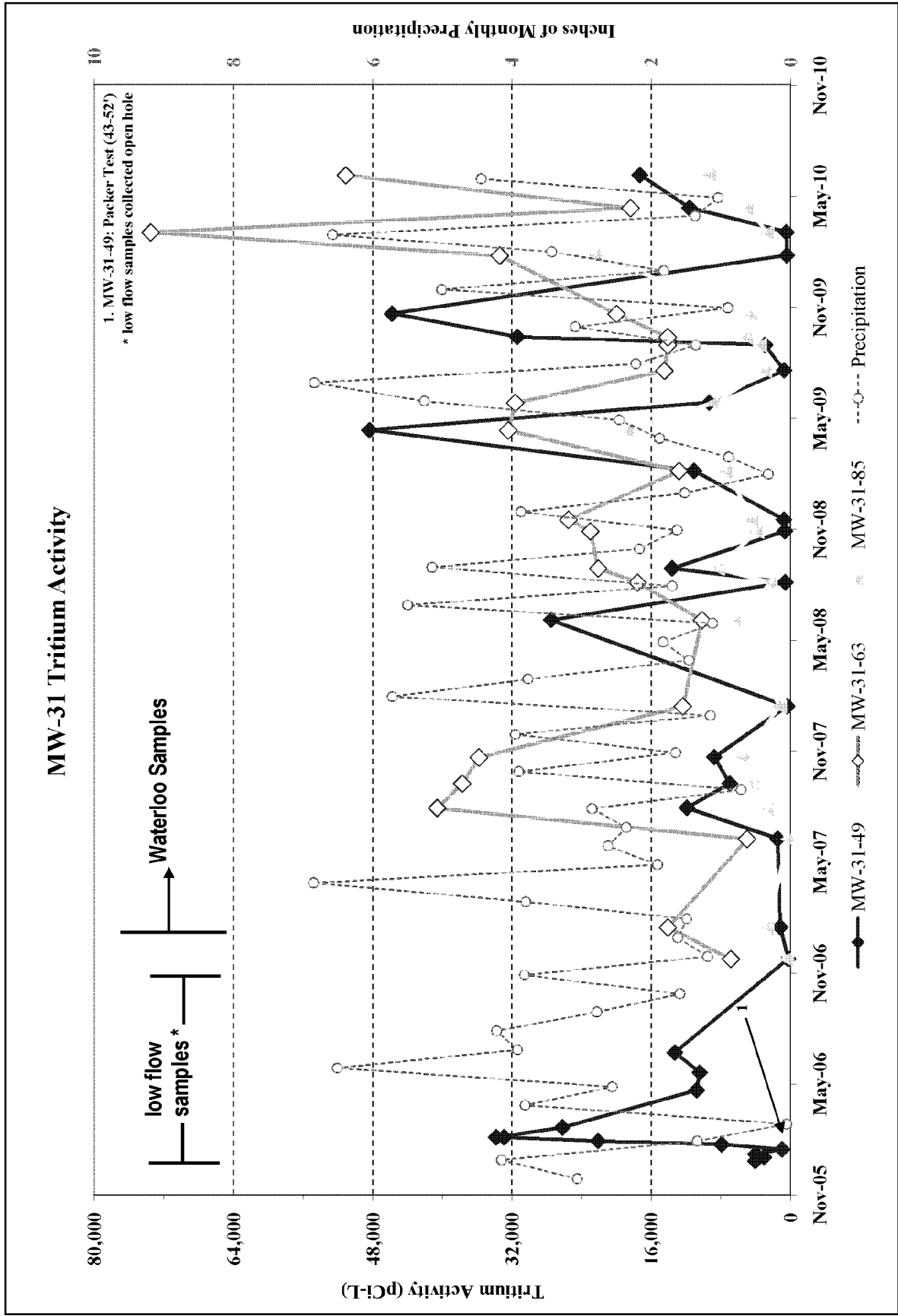


FIGURE G2

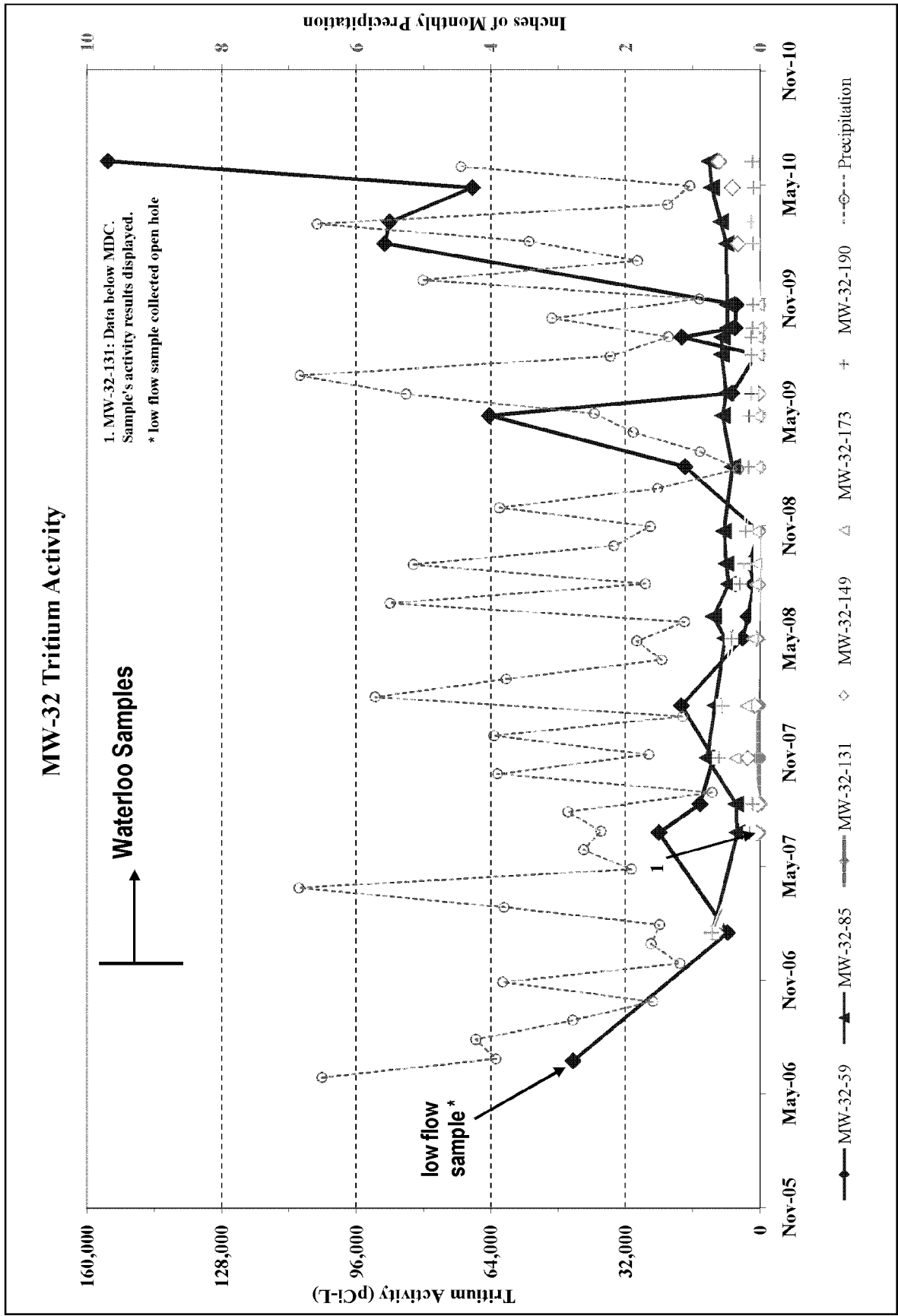


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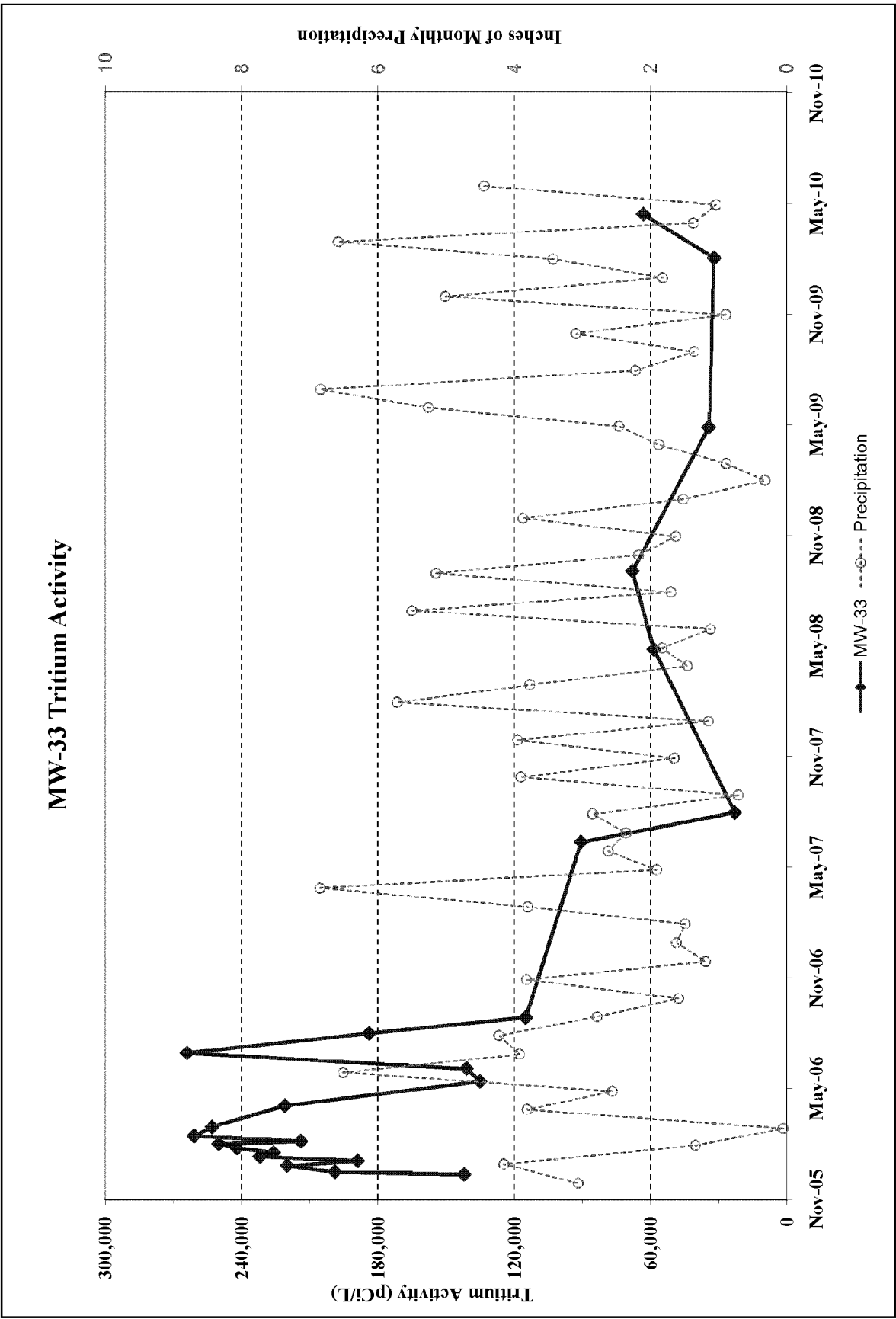


FIGURE G4

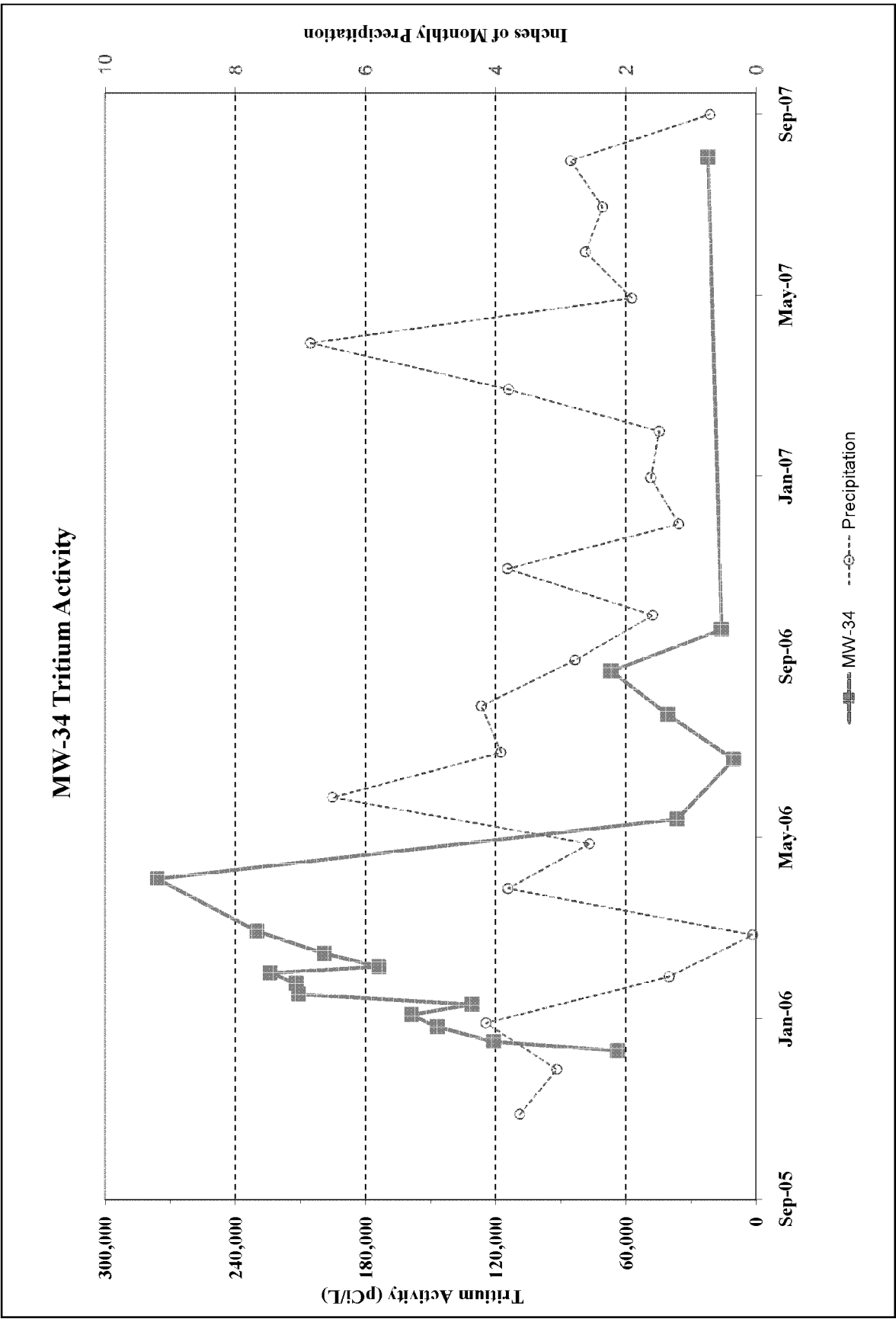


FIGURE G5

MW-35 Tritium Activity

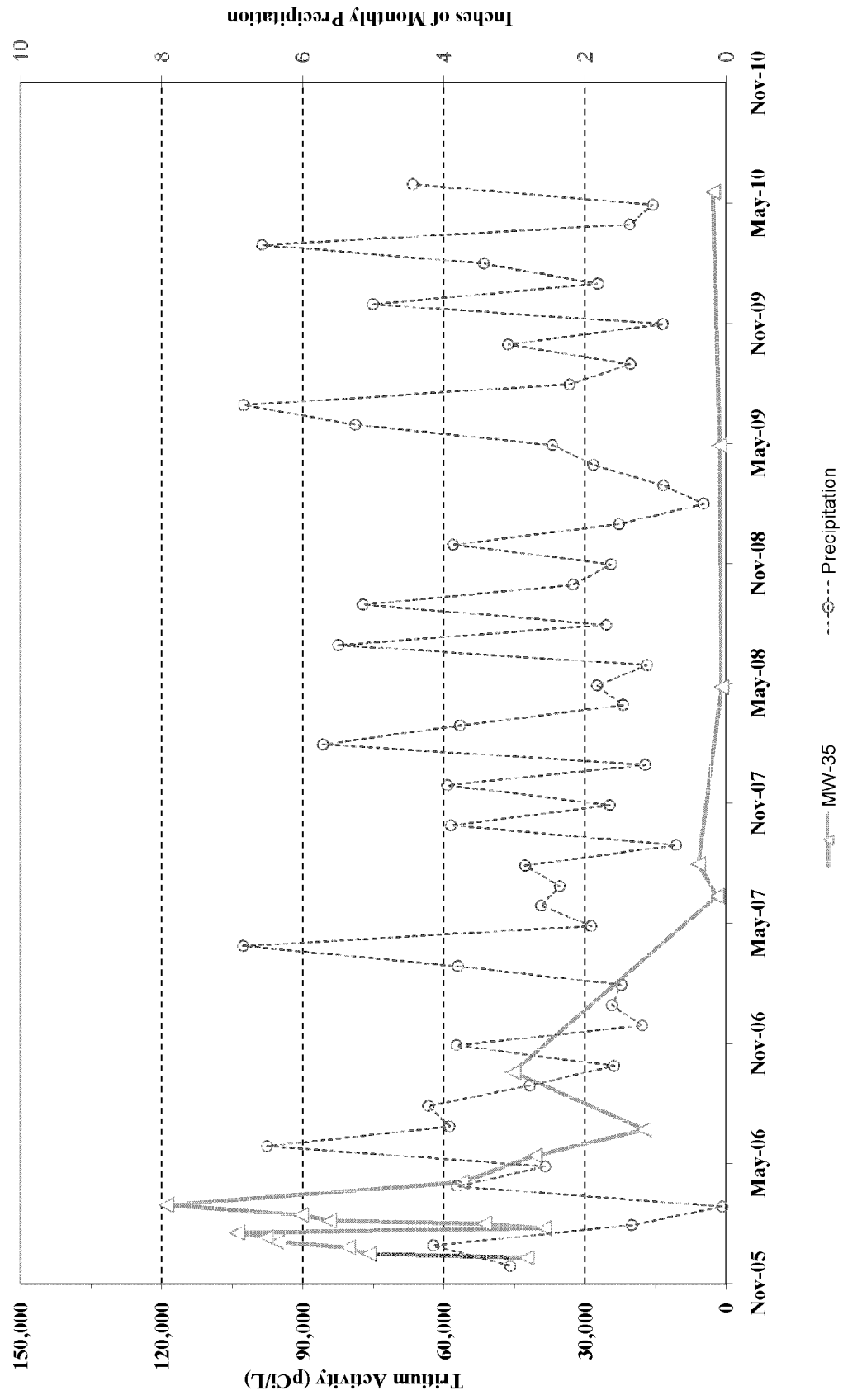


FIGURE G6

MW-36 Tritium Activity

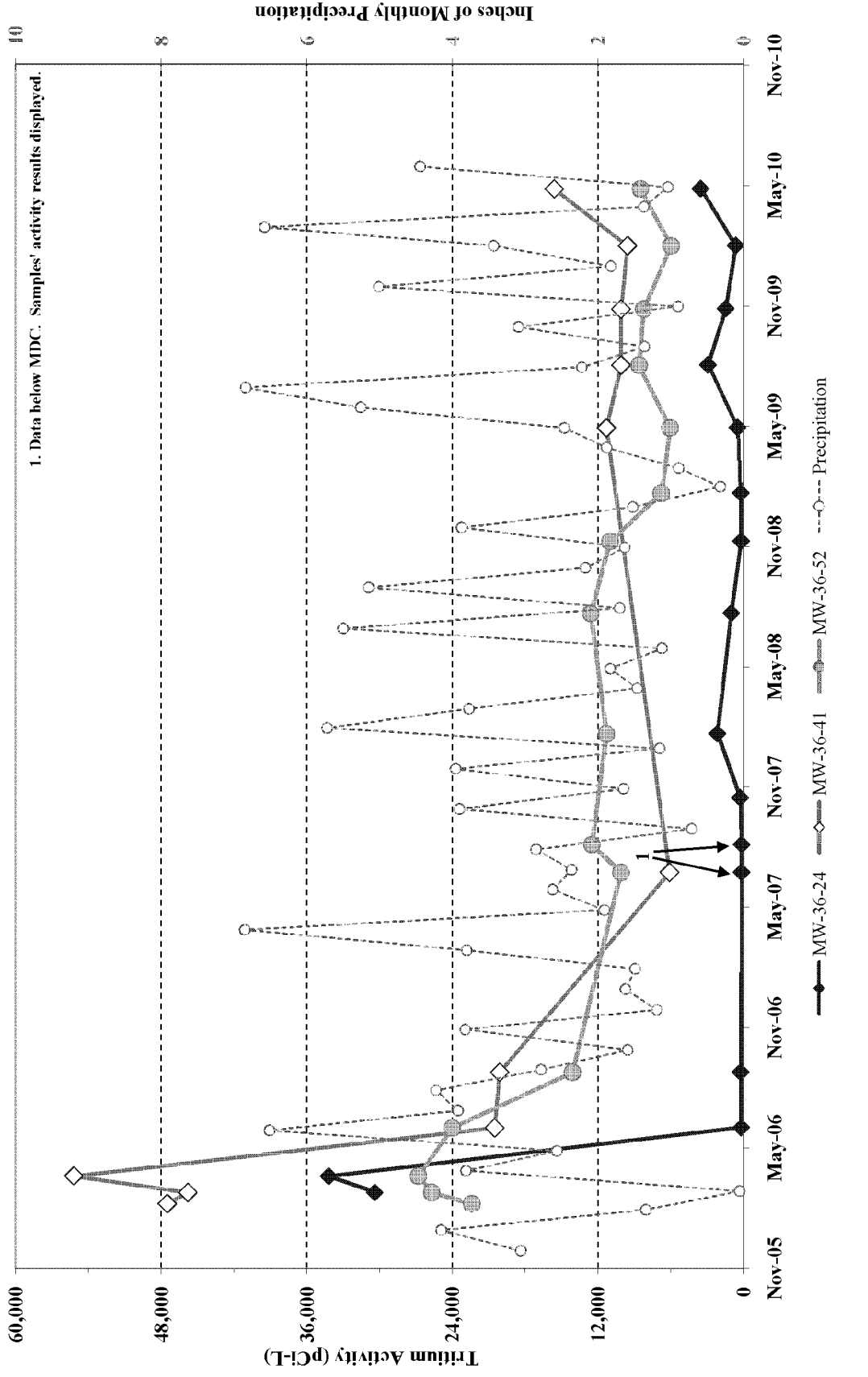


FIGURE G7

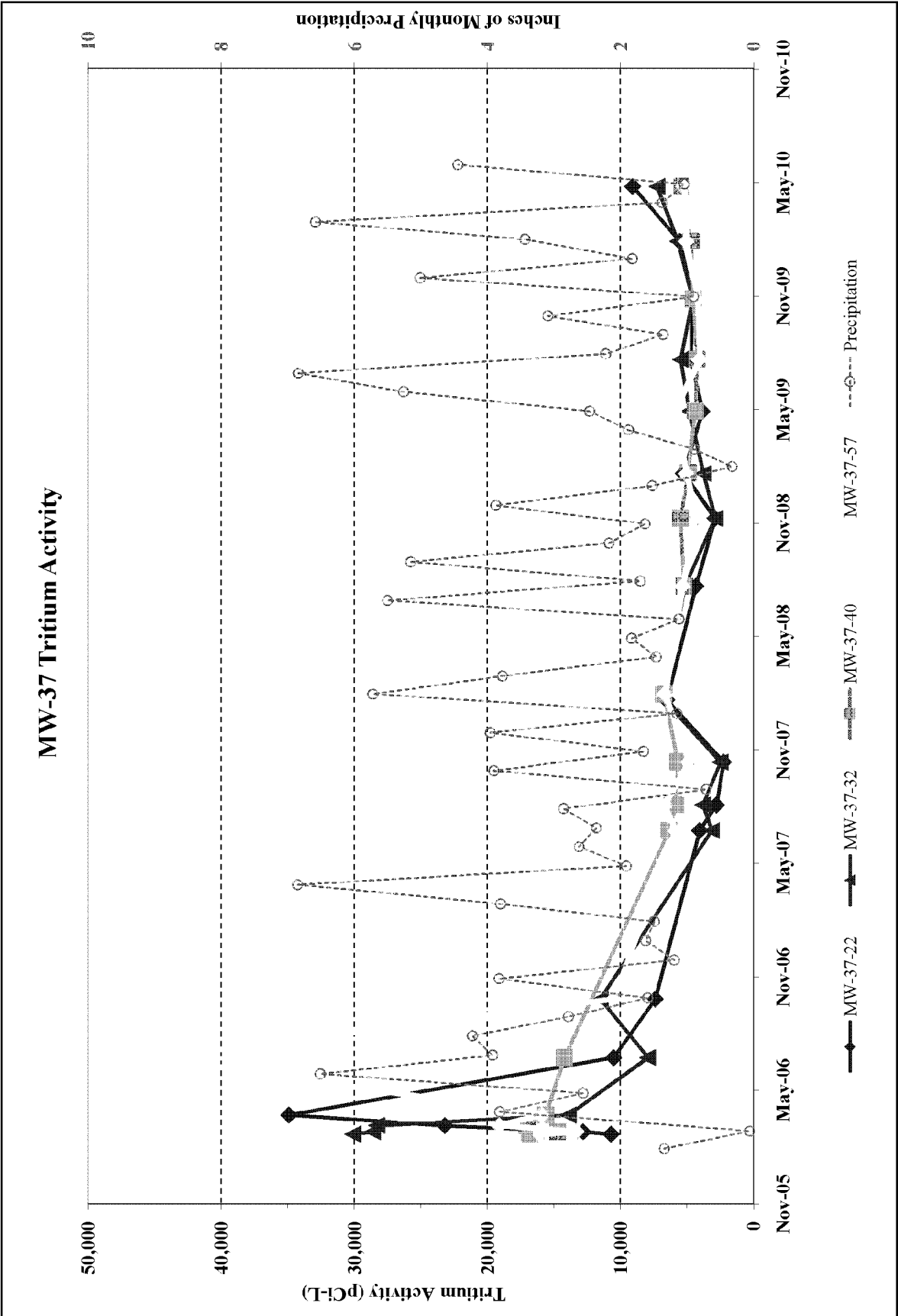


FIGURE G8

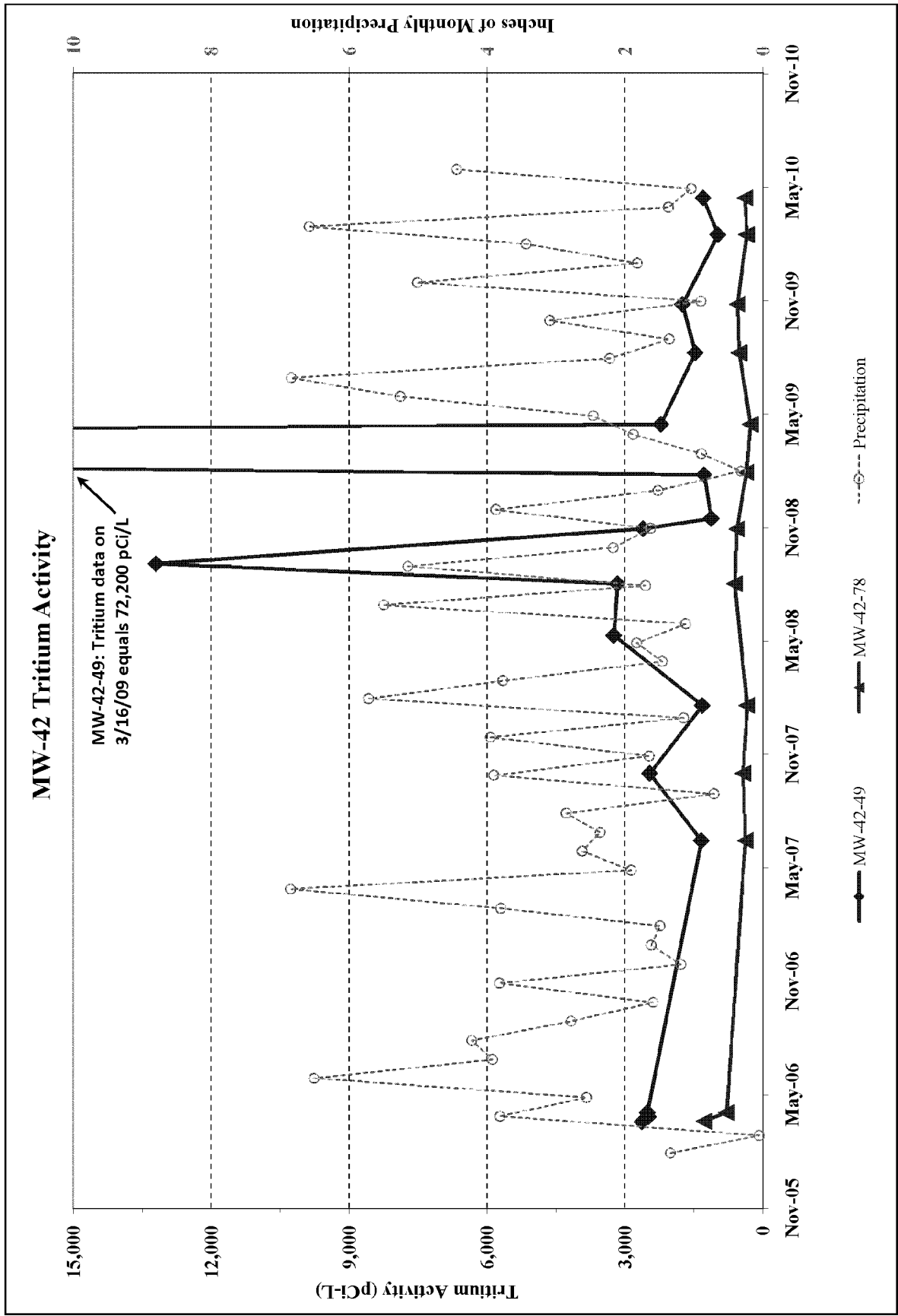


FIGURE G9

MW-49 Tritium Activity

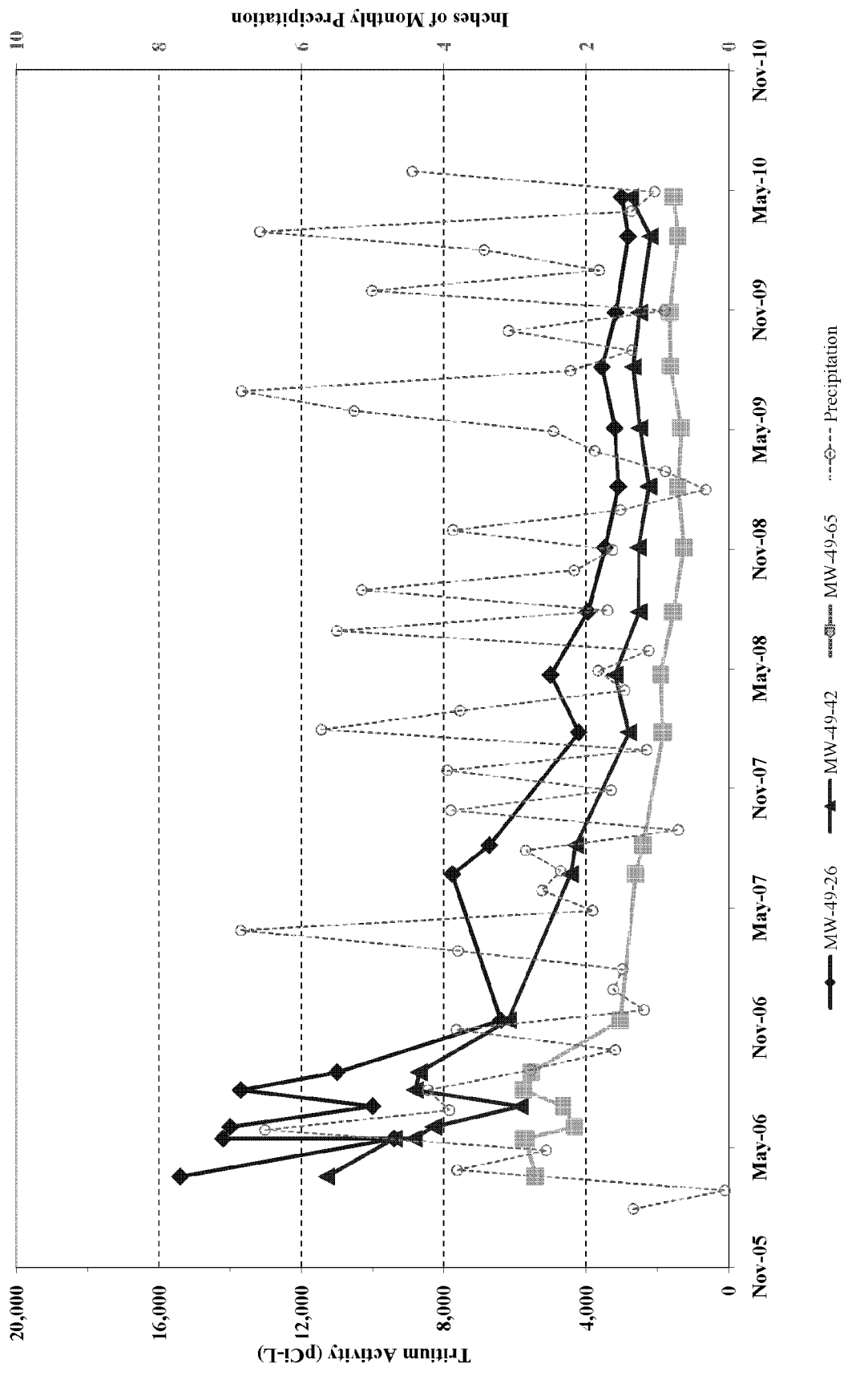


FIGURE G10

MW-50 Tritium Activity

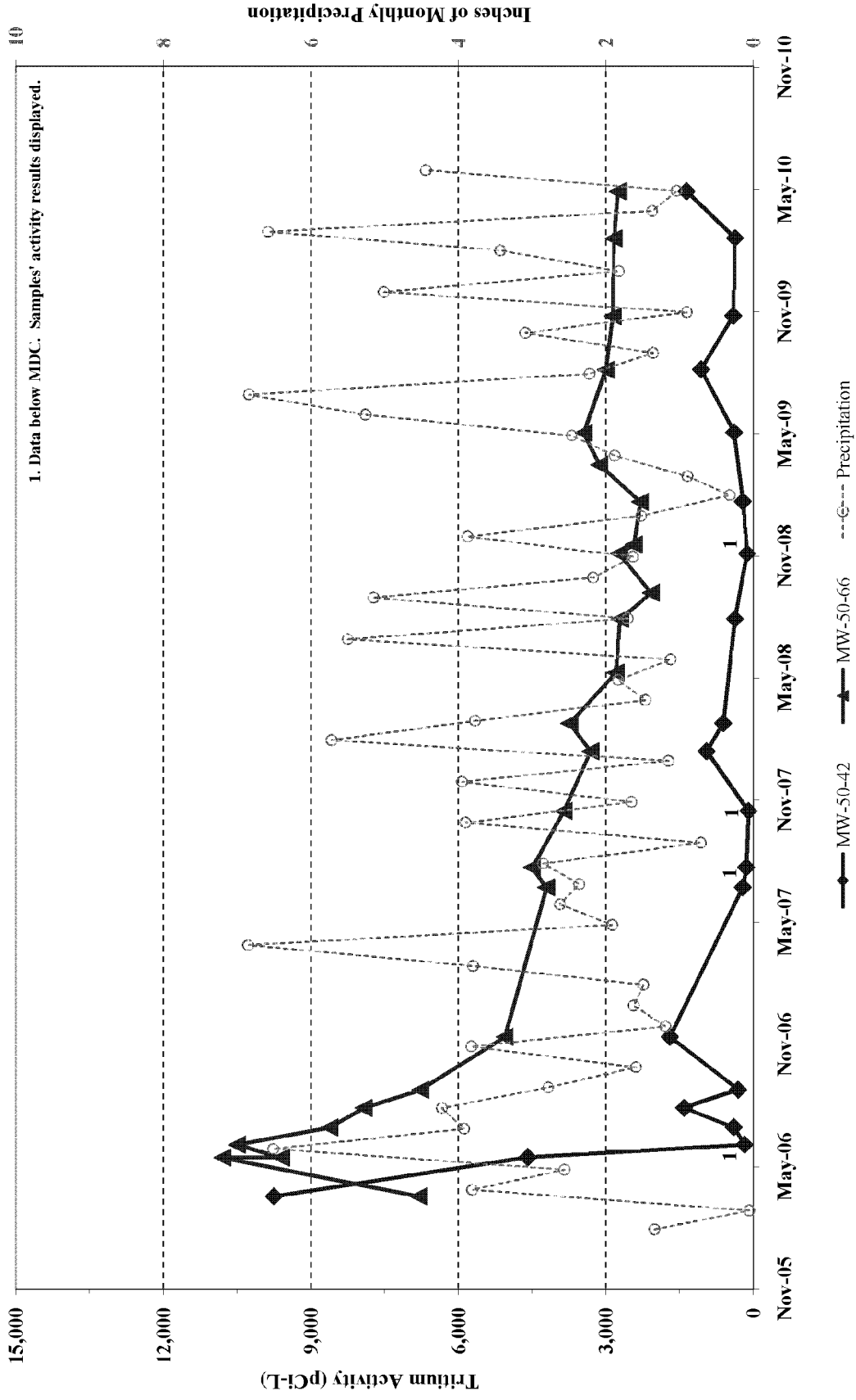


FIGURE G11

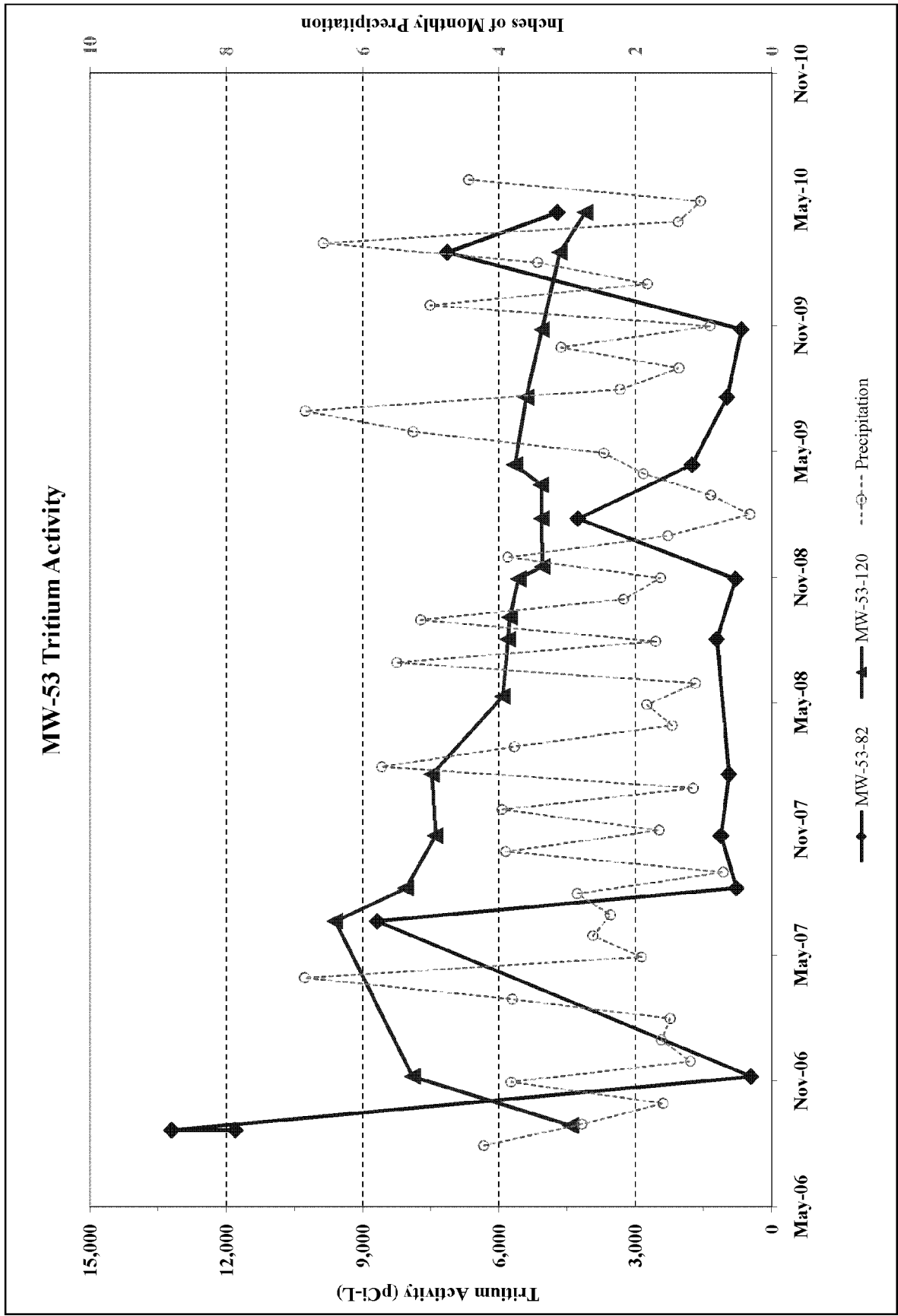


FIGURE G12

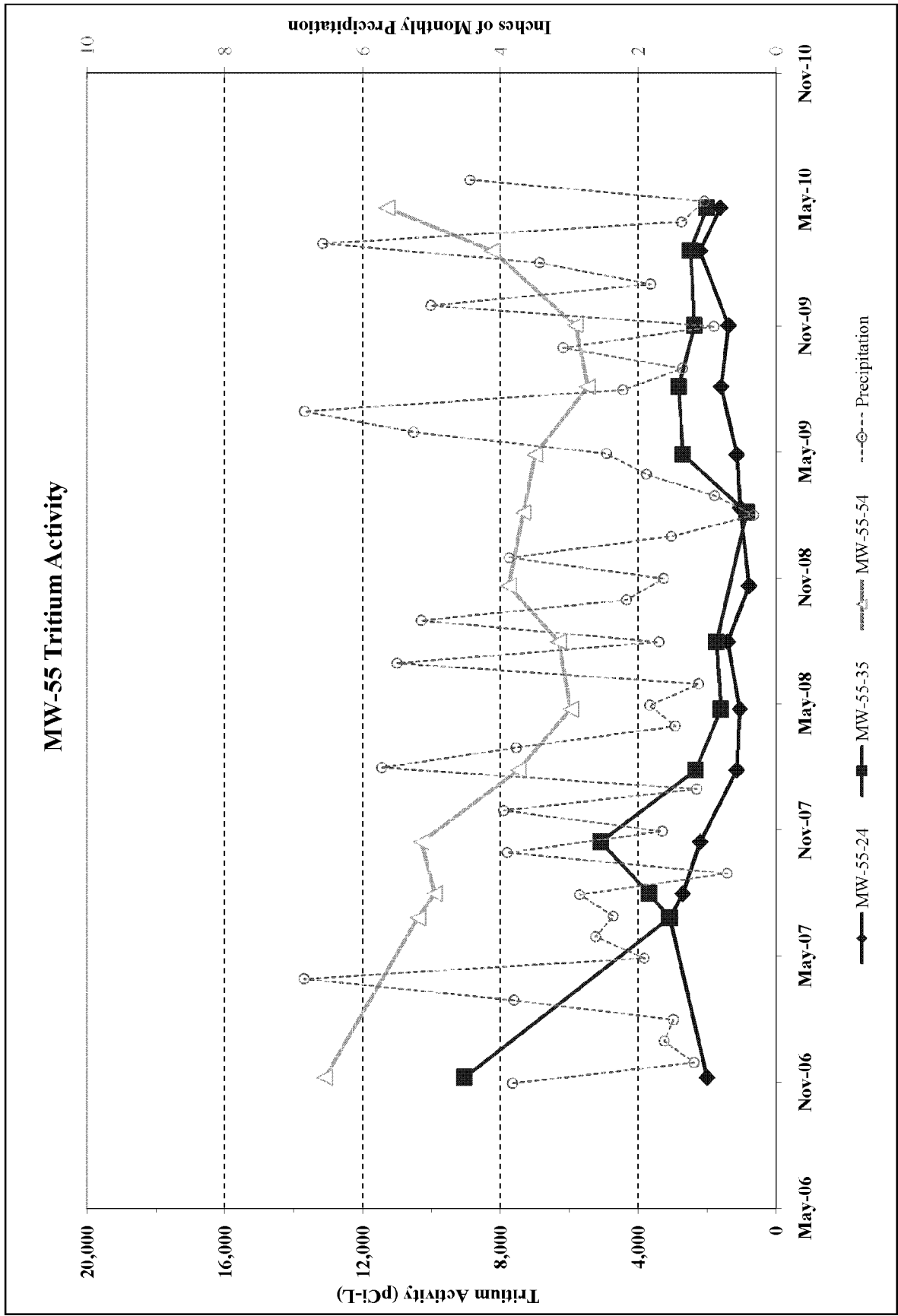


FIGURE G13

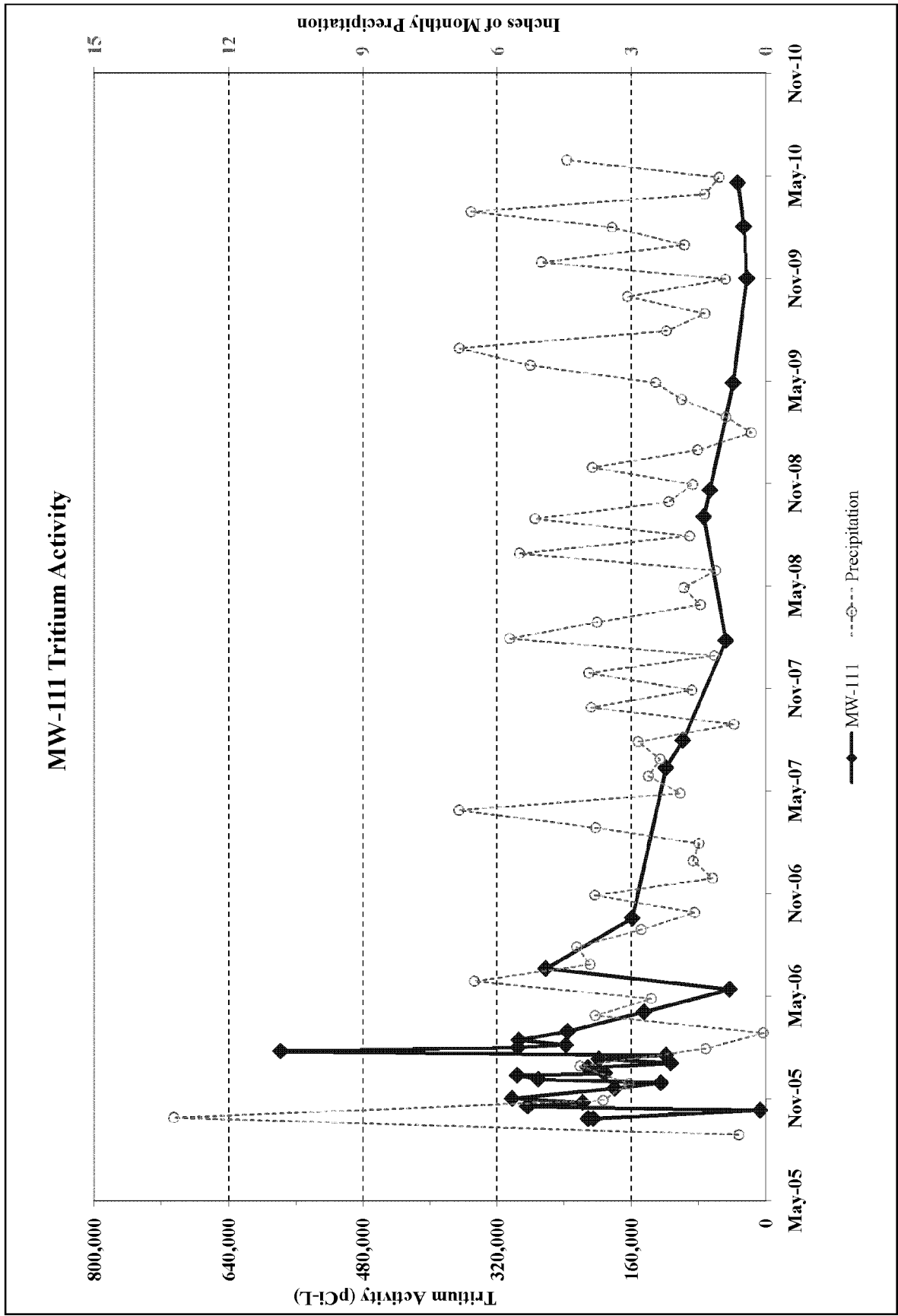


FIGURE G14

MW-66 Tritium Activity

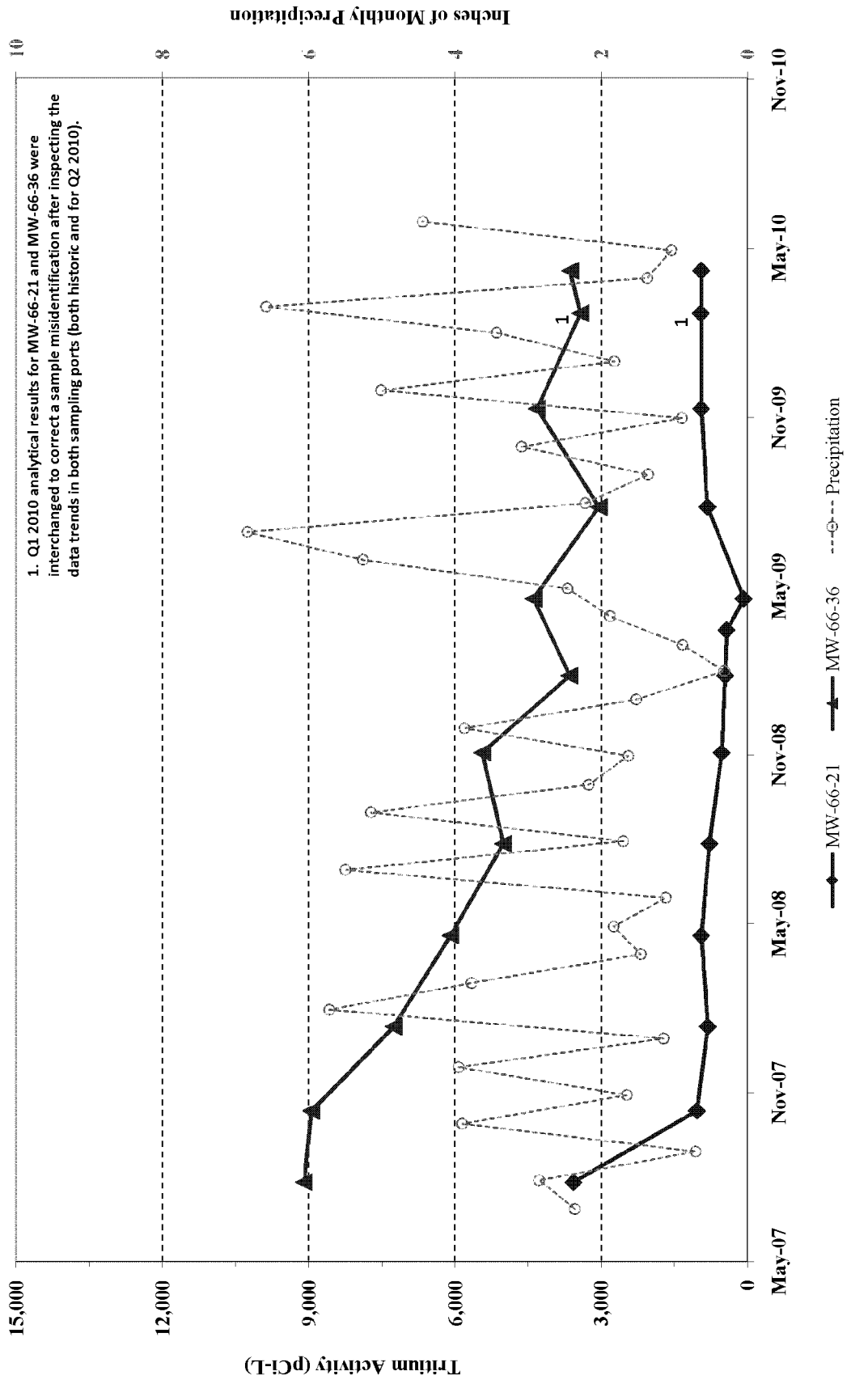


FIGURE G15

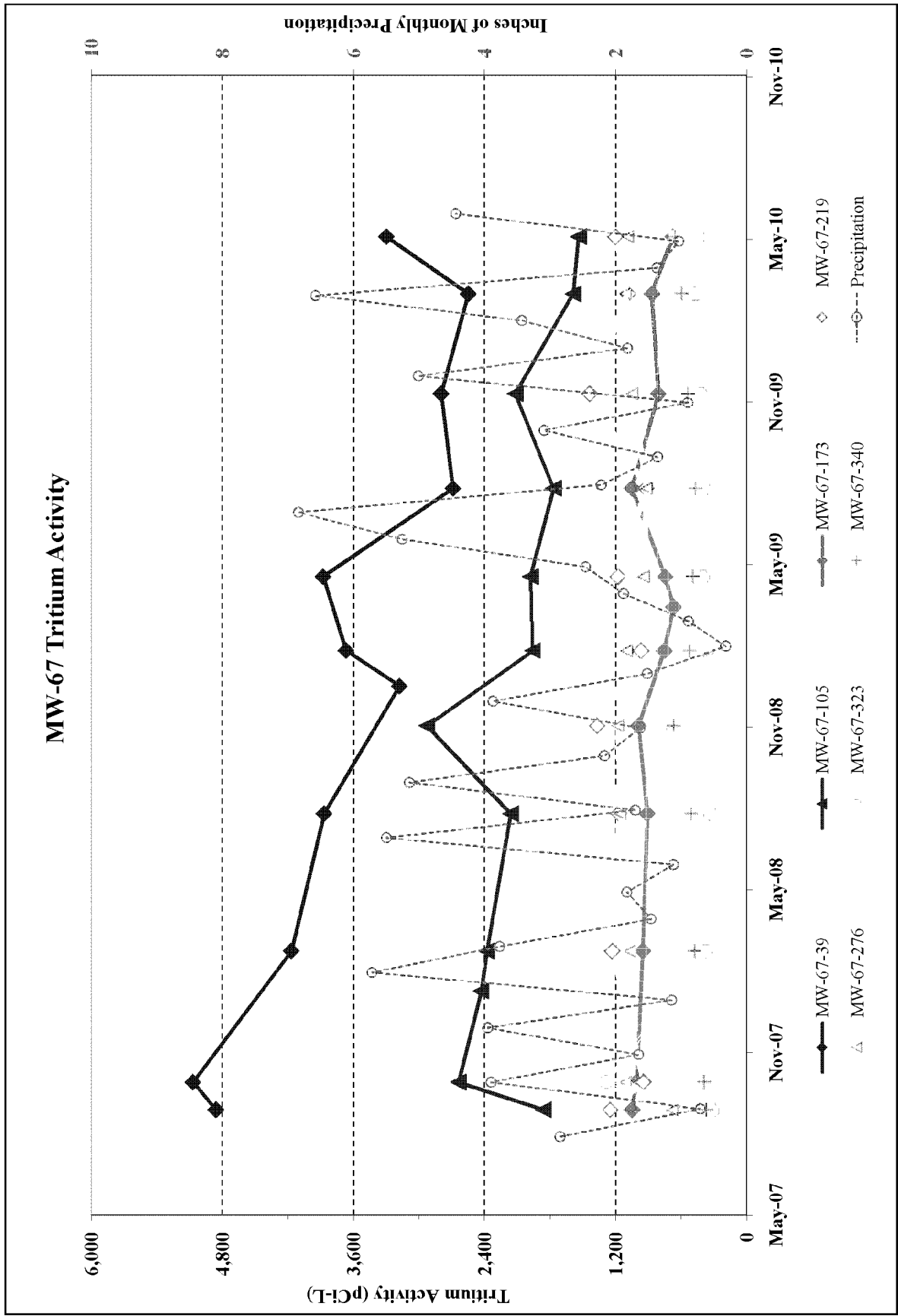
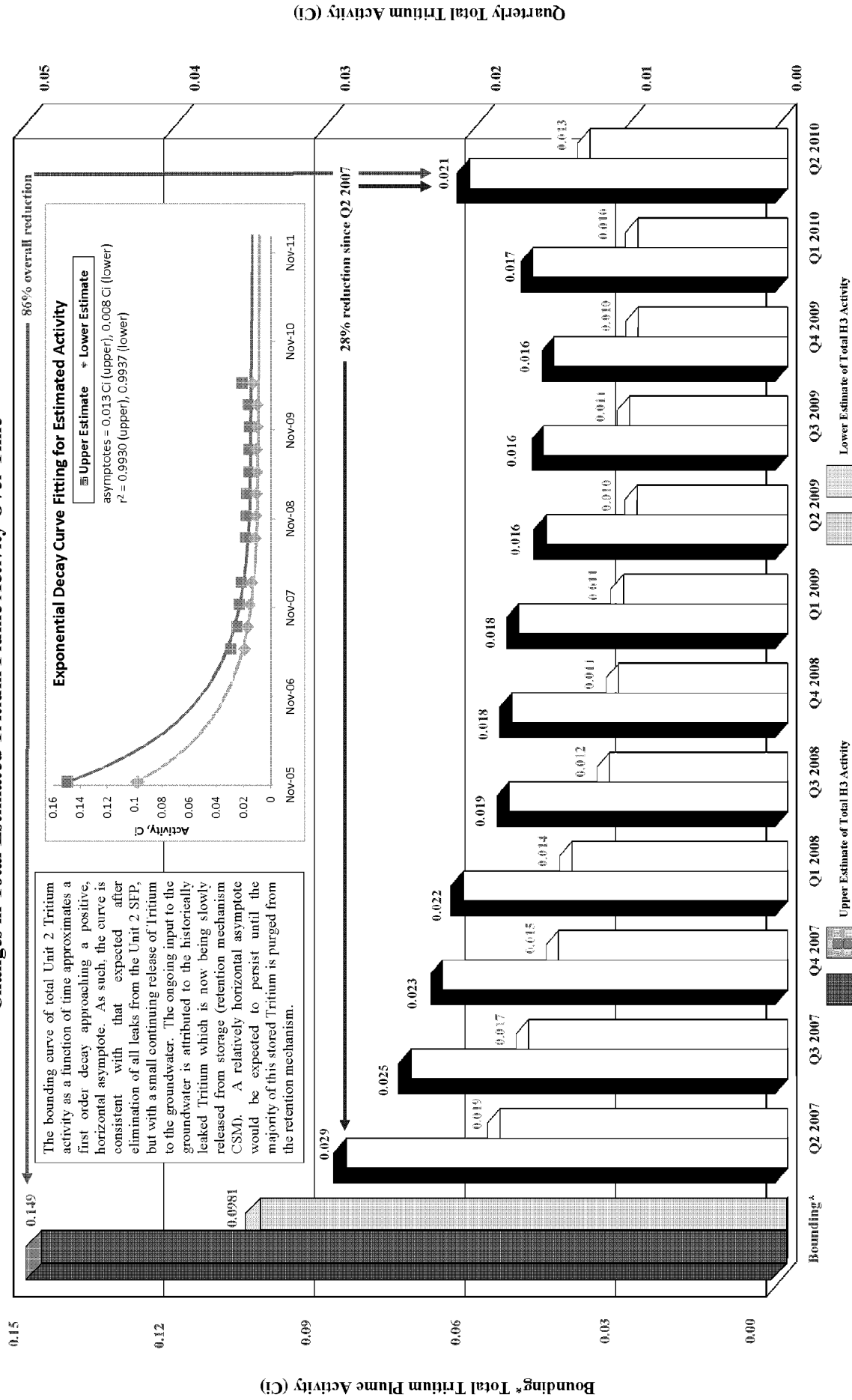


FIGURE G16

Changes in Total Estimated Tritium Plume Activity Over Time



Note: Lower estimate is based on a porosity of 0.005 which was derived from a pumping test conducted in 2005. Upper estimate is based on a porosity of 0.005 derived from a tracer test conducted in 2007. The Q2 2007 to Q1 2010 Tritium plume activity estimates are each based on Tritium levels measured in the groundwater monitoring installations at individual quarterly "snapshots" in time. The bounding activity estimate, however, encompasses a longer period of time, and is based on the Tritium levels existing during the earliest portions of the groundwater investigation. During this period of time, before termination of all the identified SFP leaks, Tritium concentrations were at their highest levels, but the network of monitoring installations was still being installed. Therefore, measurements made at a multiple times were required to capture early data covering the full extent of the Tritium plume, primarily over the period from Nov 2005 through Nov 2006 in smaller percentages of the Tritium levels required inclusion of measurements through Sept 07). For the bounding Tritium plume activity estimate, the highest value recorded for each monitoring location during this time period was used in the analysis. For further discussion see Sections 6.0, 7.0 and 8.0 of the Final Hydrogeologic Site Investigation Report, prepared by GZA and dated January 7, 2008.

Figure G-17



APPENDIX H: SOUTHERN BOUNDARY WELLS

TEMPORAL TRITIUM TRENDS IN SOUTHERN BOUNDARY WELLS

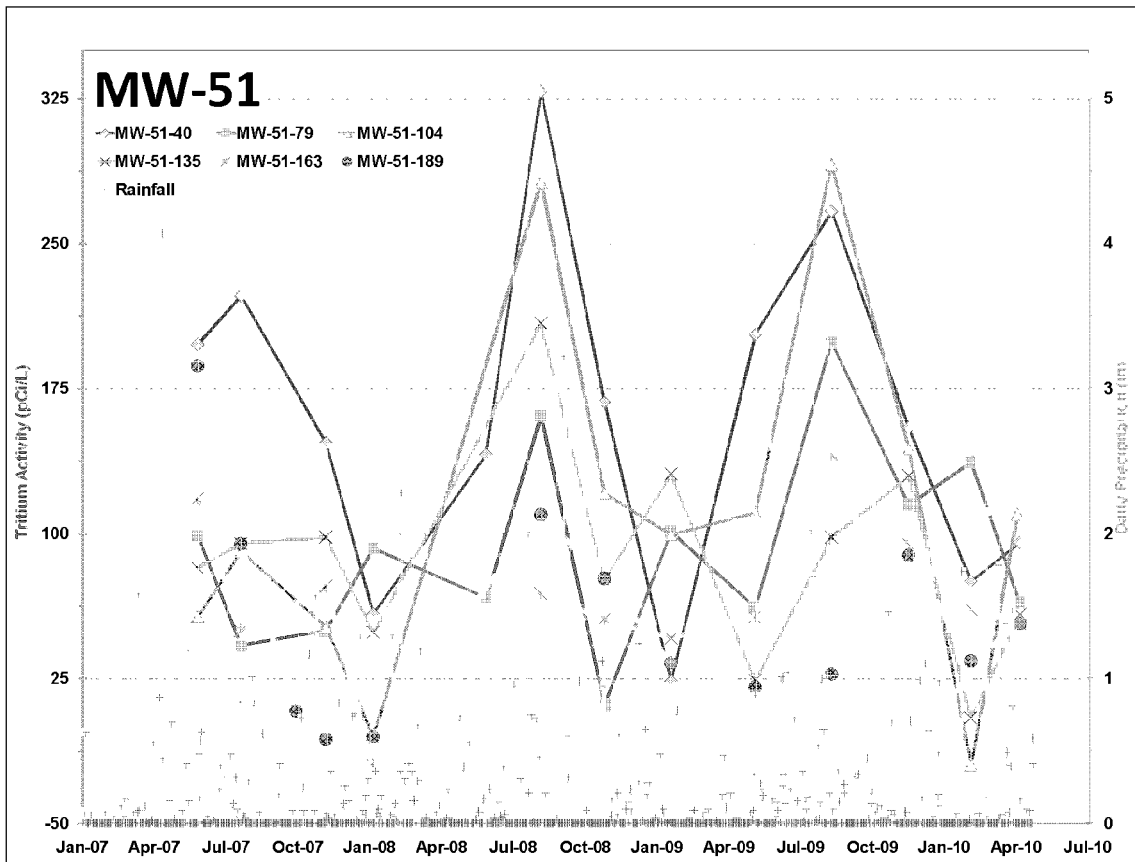
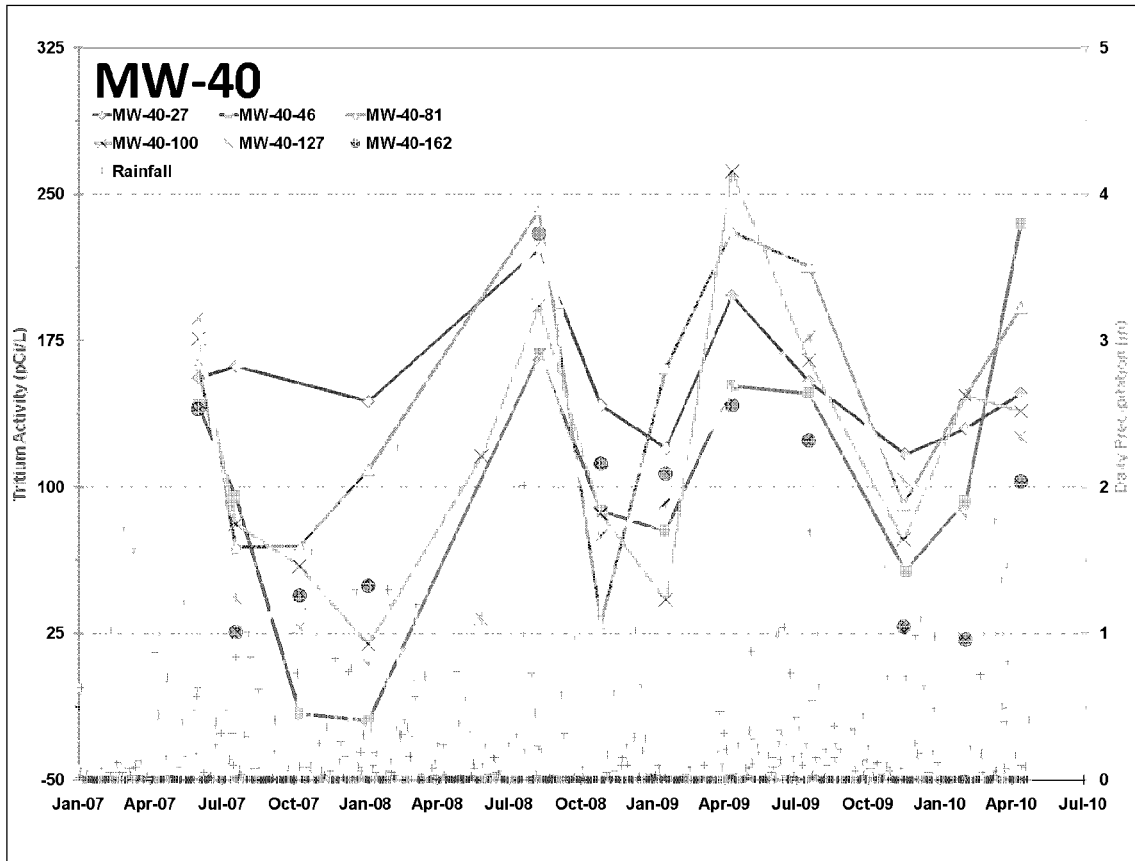


FIGURE H1