Investigation of Groundwater Source at Deep Eddy Pool

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Introduction

This report was prepared for the City of Austin's Parks and Recreation Department (PARD) to provide them with the results of an investigation into the source of groundwater supplying the Deep Eddy wells. The investigation was started when one of the two water supply wells, the upstream well, almost went dry during the extreme drought in summer of 2009. Since PARD uses the wells to supply water for a municipal swimming pool at Deep Eddy, the decrease in groundwater supply resulted in the closure of a portion of the pool. The City of Austin's Watershed Protection Department (WPD) was contacted by PARD to evaluate the condition of the wells and the source of the groundwater feeding the wells. WPD completed a short-term groundwater monitoring investigation to determine the source of groundwater used at the pool.

An evaluation of the Deep Eddy well groundwater water chemistry data by WPD has determined that the Deep Eddy wells are supplied by two distinctly different shallow groundwater sources. The results from the in-situ monitoring and follow-up comprehensive water chemistry analysis of well samples indicate that the downstream well, the well closest to the lake, is withdrawing shallow groundwater from alluvial deposits that are recharged by water from Lady Bird Lake. The groundwater from the upstream well originates from another shallow alluvial deposit that receives little to no recharge from the nearby lake. Preliminary water chemistry data suggests that leakage from Northern Edwards Aquifer may be a possible source. These finding are based on variations in concentration of water chemistry parameters and their responses to the daily fluctuations in the elevation of Lady Bird Lake. Overall, the comprehensive water chemistry results indicate that the groundwater at Deep Eddy shows no sign of impacts to the water quality at the wells other than what we would normally expect from any urban well.

Site Location and Pool

Deep Eddy Pool is located in West-Central Austin on the north side of Lady Bird Lake. The West-Central Austin area is defined as the area bounded by Lady Bird Lake in the South, 35th Street in the North, MoPac Expressway in the East, and Lake Austin in the West. Deep Eddy pool is adjacent to Lady Bird Lake at 401 Deep Eddy Avenue. The pool is the oldest swimming pool in Texas. The pool is a 558,000 gallon public swimming pool owned by the City of Austin Parks and Recreation Department (PARD) since 1935. About two-thirds of the pool is a shallow wading pool with a depth ranging from 9 inches to 4 feet. The volume of the shallow end is 248,000 gallons. The remaining portion is reserved for lap swimming and the depth ranges from 4 feet to 8 feet. The

volume of the deep end is about 310,000 gallons. The pool volume calculations are provided in Appendix A. The City operates the pool as a non-chlorinated flow-through system using groundwater supplied by two large diameter hand-dug wells; the upstream well (COA FSDB No. 759; State Well No. 5842904) and downstream well (COA FSDB No. 4522; State Well No.5842906).

The Deep Eddy wells are about 6-ft in diameter and are about 25-ft deep. The downstream well shaft is cased with 6-ft oval-shaped steel plating. Groundwater fills the well from a 4-ft diameter opening cut into the floor of well. The upstream well appears to be of similar age, likely constructed in similar fashion; however, there is 30-inch diameter and 20-ft long concrete pipe that extends below ground to 5-ft void at the bottom of the well. The pipe obscures the view of the casing material. As a result, the exact method of construction is not known. A general schematic of wells are included in Appendix A. The current water-use estimate for the pool is about 800 acre-feet of water a year. Based on the conversation with pool staff that it takes about 10-hours to fill half of the pool, pumping rate is estimated to be about 250 gallons per minute (gpm) per well. Both wells pump continuously to maintain the level and circulate water through the pool. The pumps are only turned off for a few hours to drain the pool for cleaning every two to three days.

Site Surface Geology

A site-specific subsurface and surface geologic investigation has not been completed at Deep Eddy Pool. The findings in this report will rely on the existing published surface geologic maps of the area. In the Deep Eddy area, two geologic maps are available. A detail map completed by Peter Rodda in 1970; the Geologic map of the Austin West Quadrangle and a second map by A.R. Trippet and L. E. Garner completed in1986: Geologic of the Austin Area, Texas. The maps differ slightly, because geology maps usually are lithofacies maps based on separating the rock layer or stratigraphy depending upon changes in composition and characteristics of rock units. The separation of these geology formations and deposits varies depending on the method used and the degree to which a formation is subdivided by the geologist(s) who made the map. The advantage of Rodda's geologic map is that Quaternary-age Lower Colorado River Terrace Deposits are subdivided in more units compared to the map completed by Trippet and Garner.

Geologic maps are also created by separating the rock units by hydrogeologic characteristics such as porosity and permeability. A geologic map based on hydrostratigraphic units has not been completed for the West Central Austin area and the associated Northern Segment of the Edwards Aquifer. However, a geologic map based on the hydrostratigraphic units was produced by Ted Small and P. R. Rose for the Barton Springs Segment of the Edwards Aquifer. Because hydrostratigraphic units give a better understanding of the movement and transport of groundwater, the Small/Rose map was used in this study. Though this map does not extend across the river, it was possible to infer the same units for Deep Eddy.

Because the Rodda map gives a better understanding of the Colorado River Terrace Deposits, it was used in the study to determine the deposits in which the wells are situated. The Rodda map is shown in Figure 1. The map indicates five geologic units are present within the park, four units from the Quaternary-age Lower Colorado River

Terrace Deposits and two members from the Cretaceous-age Edwards Formation. One normal fault is mapped along the western edge of the park with the pool and well on the downthrown side of the fault. The orientation of strike of the fault is similar to the regional trend of the Balcones fault system of N 40 E. In the park, the fault is concealed by overlying terrace deposits.

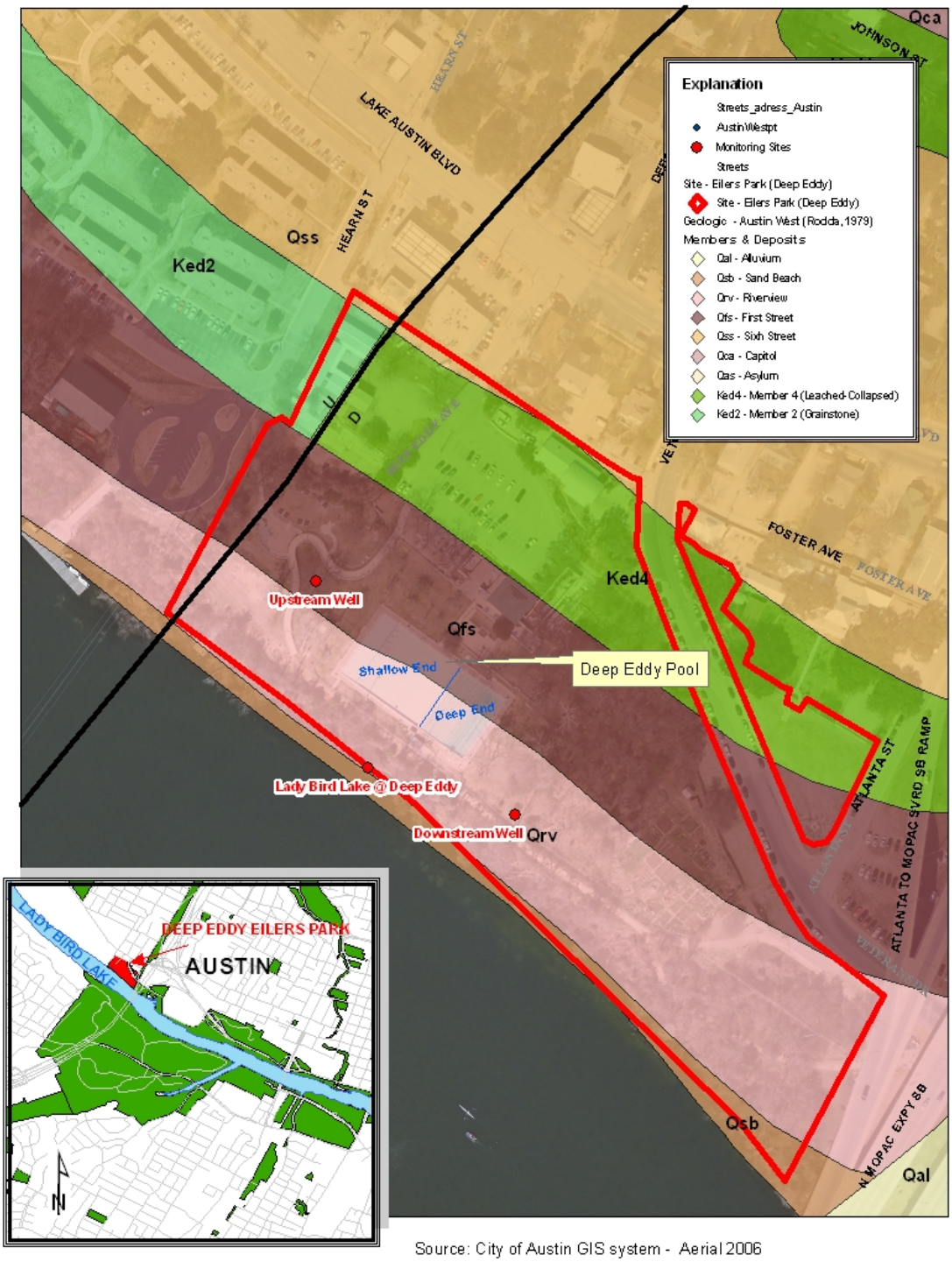
The terrace deposits overlie much of the Edwards Formation in the West-Central Austin area and extend north as far as 35th Street. Faults and most of the recharge features, like caves and sinkholes, are concealed by this deposit and overlying urbanization. The terrace deposits have been separated into six deposits. From oldest to youngest these are: Asylum (Qas), Capitol (Qca), Sixth Street (Qss), First Street (Qfs), Riverview (Qrv), and Sand Beach (Qsb) (Rodda, 1979). The deposits are composed of mostly unconsolidated gravel, sand, silt, and clay. The Asylum and Sixth Street deposits, which are not present on site, are cemented with calcium carbonate and have higher gravel content. These units are highly dissected and occur at elevations above 500-ft (msl). All the units grade upward from coarse-grain to fine-grain (Garner and Young, 1976). The typical thickness for Asylum, Capitol and Sixth Street deposits is 25-30-ft; the maximum thickness of the other deposits is 40-ft (Rodda, 1979). The Sand Beach, Riverview and First Street terrace deposits are present on site. The lowest two, Sand Beach and Riverview, were frequently flooded before the construction of dams on the Colorado River. The units are continuous whereas the three oldest and highest units are dissected by local creeks and form isolated erosional outcrops that blanket the hilltops in the area. The lowest alluvial deposits, Sand Beach and Riverview, are exposed at or near the normal pool elevation of the Lake and are saturated with lake water. Since these units are recharged by Lady Bird Lake, they can supply large amounts of water to the wells.

Two members of the Edwards Formation are mapped: Members 2 and Member 4 (oldest to youngest). Member 2 is mapped in the northwest corner of the park where the aquatic administration buildings are located and is equivalent to the Grainstone hydrostratigraphic member. This member is 40-ft thick and overlies Member 1, which is the lowest member and estimated to be 200-ft thick. Member 1 includes Dolomitic and Kischeberg hydrostratigraphic members with the top of the member marked by the Kirscheberg Evaporite, which is about 20-ft thick and contains many major caves in the Austin Area such as Flint Ridge Cave. Member 4 is equivalent to the leached-collapsed hydrostratigraphic member. In the Austin area, caves and subsurface groundwater flow commonly occur in the leached-collapsed member. Airman's Cave and Austin Caverns are examples of two cave systems that are restricted to this member.

Water Resources

Two potential groundwater sources are present in the Deep Eddy area: shallow and deep groundwater. The shallow groundwater is within the terrace deposits; the deeper groundwater source is the Edwards Formation. The Deep Eddy wells are constructed in the terrace deposits and withdraw water from shallow groundwater. Water chemistry data indicates that the source of the groundwater varies for these alluvial deposits. The geologic map shows that the upstream well exists within the First Street (Qfs) alluvial deposit and the downstream well is constructed in the Riverview (Qrv) deposit. Considering that alluvial deposits along rivers can change in size and position and that

Figure 1: Geology and Location Map



Source: City of Austin GIS system - Aerial 2006

these changes can be abrupt or gradual, both vertically and horizontally, geotechnical bores are needed to determine whether the surface interpretation is correct. Again, these deposits contain shallow unconfined aquifers in the Austin area. The St. Elmo terrace deposit and similar deposits occurring along the Colorado River within its ancestral floodplain contain several small springs in the Austin area. These aquifers and springs are susceptible to decreases in water yield during droughts and to groundwater contamination. Groundwater infiltration and contamination problems are known to occur in the same alluvial terrace deposits in the downtown Austin area.

The Northern Edwards Aquifer is the next available groundwater source. Members 2 (Grainstone member) and Member 4 (Leached-collapsed member) are exposed at the surface on site. The Northern Edwards at about 400-ft thick is a segment of the Aquifer and thins to north in Jollyville Plateau in northwest Austin where the Edwards Formation is only 100-ft thick. Groundwater circulation in the Northern Segment is much slower compared to the Barton Springs Segment, because of the reduced number of faults in the Northern Segment (Senger and others, 1990). The reduced circulation or transmissivity increases the groundwater reaction with the host rock resulting in high concentrations of some of the major ions that occur in groundwater. As a result, the groundwater has a higher specific conductance than that observed in the lake. Thus, major ions and conductivity are potential indicators of Northern Edwards aquifer water. According to the Texas water Development Board Water Information Integration & Dissemination (WIID) database, there are at least nine wells in the Edwards Aquifer in the West-Central Austin area. Most have had water quality samples taken only in the 1940's or 1950's. Because of uncertainty regarding water quality and quantity, a hydrogeologic investigation should be completed to evaluate Northern Edwards as a water supply source.

The Trinity Aquifer is another local water supply source. The Trinity aquifer is within the Glen Rose Limestone Formation which underlies the Edwards Formation and is over 400-ft below surface. Given the depth of the aquifer, it is an unreasonable water supply source due to the difficulty and cost of drilling such a deep well. In fact, the Texas Water Development Board database indicates no wells have been constructed in the Trinity Aquifer in the Tarrytown area.

Lady Bird Lake (aka: Town Lake) is the closest surface water supply. The Lake is used by the Lower Colorado River Authority to supply water and generate electricity. The lake level fluctuates daily by about 1-ft because of power generation activities at Tom Miller Dam. Also, LCRA supplies rice farmers with irrigation water and releases water downstream from October to March. The water quality of Lady Bird Lake has been intensively studied by City of Austin since 1991. In general, the water quality data indicate the Lake is impacted by urbanization of the watersheds that flow into the lake. Water Quality improves when Lake Travis water is released into Lady Bird Lake. During periods of nonrelease and after rainfall events the quality of lake water declines as urban runoff enters the lake. Overall, the forecast for changes in water quality for Lake Bird Lake is unclear (COA, 2004). Using the lake to supply Water to Deep Eddy will require acquiring water rights from the Lower Colorado River Authority. Even if rights were granted, supply to the pool with water during stage 2 drought conditions is not allowed.

Results from Continuous Monitoring Physicochemical Water Chemistry Parameters

In-situ continuous monitoring of field or physical water chemistry parameters using a DataSondes was completed at the upstream well for a five week period from September 21st to October 27th, 2009 to determine the possible source of the groundwater for the wells and to understand how the well water chemistry is effected by operating the wells and by the daily lake fluctuations. The downstream well was monitored from October 1st to October 27th, 2009. Five parameters were monitored every 15-minutes: water temperature, dissolved oxygen, conductivity, water level (or depth), and pH. In addition, rainfall and lake levels information data was downloaded from LCRA for the Longhorn Dam. During the sample period, a few problems occurred. The instrument deployed in the upstream well was accidentally removed from the well on September 29 for about 1 hour and 45 minutes. Also, the instrument stopped logging from September 30 at 12:00 PM to October 6th at 11:00 AM. When staff pulled the downstream DataSondes from the well on October 27th, we discovered it was slightly fouled with silt. As a result some measurements might have been slightly skewed. A review of data logging indicates that the instrument was completely fouled on October 25th at 10:00 PM.

Water Temperature

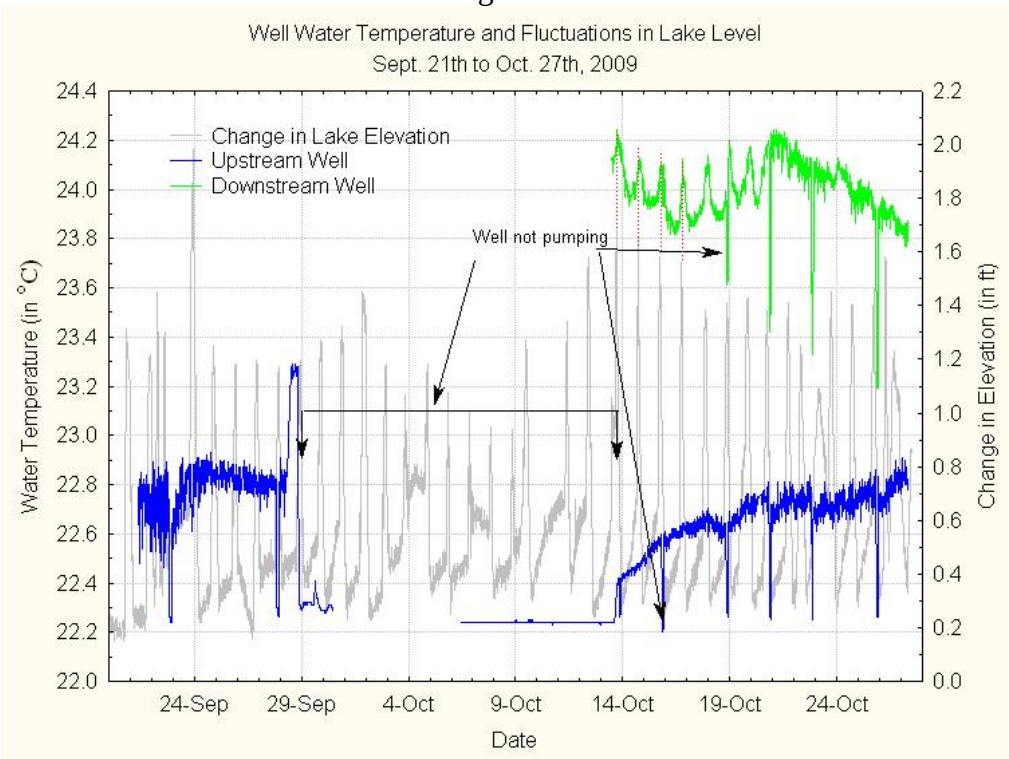
Water Temperature can be an indicator of the source of groundwater. Since the temperature of water changes slowly as it migrates through the subsurface and water has a high specific heat capacity, water temperature can be used to trace seasonal fluctuations of recharging surface water and upwelling of deep confined water. The high specific heat capacity means that water absorbs a large amount of heat energy from the environment and stores it. As a result, in the winter time, water temperature of spring water will be warmer than ambient surface water temperature. In shallow aquifers recharged by lake water, water temperatures will fluctuate seasonally with the changes in ambient water temperature.

The water temperature data for upstream and downstream wells from in-situ monitoring are shown in Figure 2. The sharp drops in temperature seen in both wells are a result of having the well pumps turned-off for routine clearing of pool. The upstream well pump was turned off for 2-week period from September 29th to October 13th to see whether the water chemistry changed significantly and how quickly the water table recovered from the effects of groundwater withdraws. The average water temperature for the upstream well is 22.6°C. The average water temperature for the downstream well is 24.0°C, which is similar to the average value for Lady Bird Lake of 23.5 °C for the months of September and October. The upstream well is 2.6°C colder than the downstream well. When groundwater is not being withdrawn from the upstream well, the water temperature decreases to about of 22.2°C. The same is not true of the downstream well. Its water temperature remains warmer than the upstream well's water temperature and it oscillates with the daily changes in lake elevation.

The water temperature results from the downstream well oscillate with the daily fluctuation of lake levels; peaks in water temperature corresponded to peaks in lake elevation. This trend is clearly seen from the October 13th to October 21st period with upward spikes in water temperature corresponding to upward spikes in daily lake elevation. The fluctuations in water temperature with change in lake elevation occur

during both periods of pumping and no pumping. This same trend is not as strong during periods of groundwater withdraws in the last-half of the record. The muffled response is contributed to by the rainfall and the fouling of the instrument from silt accumulating on some of the probes during its deployment. This same water temperature response is not seen in the upstream well. This lack of response to pulsing of lake levels and the 2.6°C lower average water temperature suggests that the upstream well is not situated in the same alluvial deposit as the downstream well. Furthermore, the water from the lake does not recharge the First Street Alluvial Deposit.

Figure 2



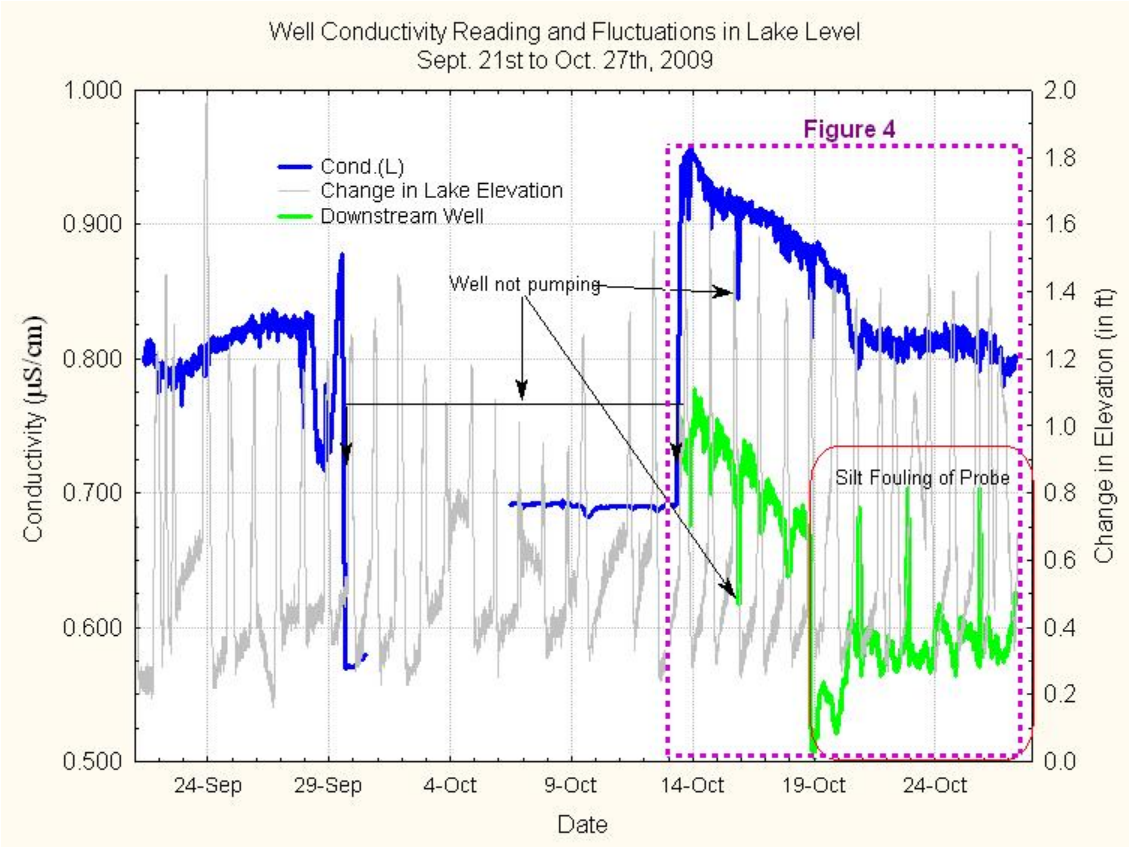
Conductivity

Water conductivity (or Specific Conductance) can be an indicator of the source of groundwater. Conductivity can differ greatly in groundwater according to the composition of the water recharging the aquifer and resistance time for the groundwater to move through the aquifer. For example, the conductivity values at Old Mill Spring in the Barton Springs Segment of the Edwards Aquifer are very different compared to Barton Springs. This difference is attributed to leakage of saline water into the groundwater flow path route for Old Mill spring. As a result of this saline leakage, the conductivity values at Old Mill are much greater than those observed at Barton Springs. As with water temperature, if the alluvial deposits are recharged by Lady Bird Lake, then the conductivity readings should be similar to the lake.

The average conductivity reading for the downstream well is 630 µS/cm, which is similar to the average conductivity of 502 µS/cm for Lady Bird Lake at Red Bud Isle since 1996 for the months of September and October. The average conductivity for in-situ data for the upstream well is 826 µS/cm, well above historical average for the lake. According to

the WPD Field Sample Database (FSDB), since 1991, conductivity levels in the lake were only once in the in 800 µS/cm range. In August to December 1991, the City detected the saline slug of water in Lady Bird Lake at the Mopac (Loop1) bridge. The saline water released from the Natural Dam Salt Lake during 1987-89 caused an increase in conductivity for the Highland Lake reservoirs as the saline inflow traveled downstream through the reservoir system (Raines and Rast, 1999). When groundwater is not being withdrawn from the upstream well, the average conductivity for the in-situ readings decrease to 690 µS/cm.

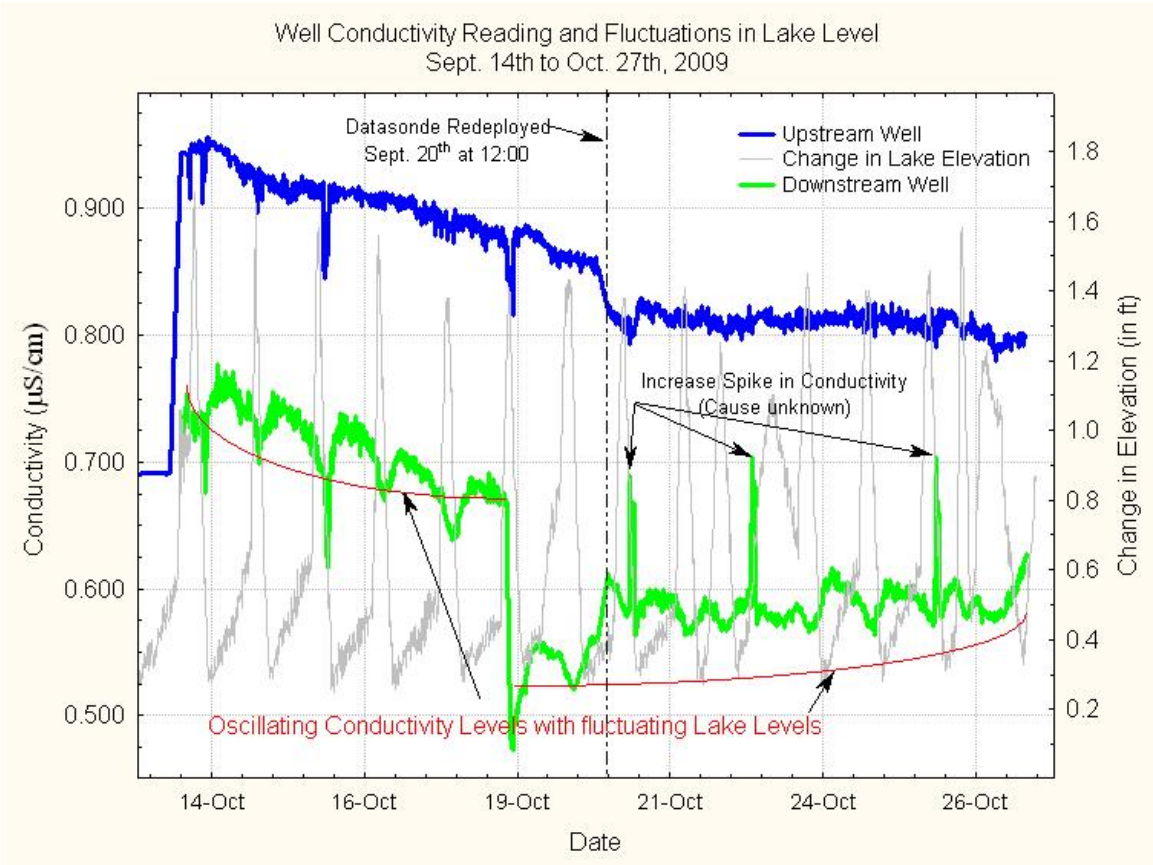
Figure 3



In fact, conductivity values in both wells tend to drop during periods with no groundwater withdraw as seen in the downward spikes in Figure 3. The behavior is consistent for both wells except for the last week of monitoring in the downstream well. The cause of the increase is unknown, but may be due to silt fouling the probe during the instrument's deployment. Overall, the higher levels of conductivity observed upstream compared to the downstream well indicate that the groundwater in the upstream well is derived from a different source. The similarities in average conductivity and the observed readings between the lake and the downstream well suggest that water from the lake is recharging the downstream well. As is the case upstream, the higher conductivity reading indicates an alternate source for the groundwater at the well. Possible sources are shallow groundwater with longer residence time within the alluvium or water leaking from the Northern Edwards Aquifer. Historical date show that conductivity readings for Edwards Wells in the West Austin Central Area range from 700 µS/cm to 1000 µS/cm. The 826 µS/cm average conductivity observed during groundwater withdraws is within this range.

However, during times of no groundwater withdraws the average conductivity decreases to levels similar to the lake. This suggests that at least two sources of groundwater unrelated to the lake are recharging the upstream well. This finding seems to be supported by the behavior of conductivity readings; no oscillation of conductivity levels with daily changing lake levels.

Figure 4



Depth

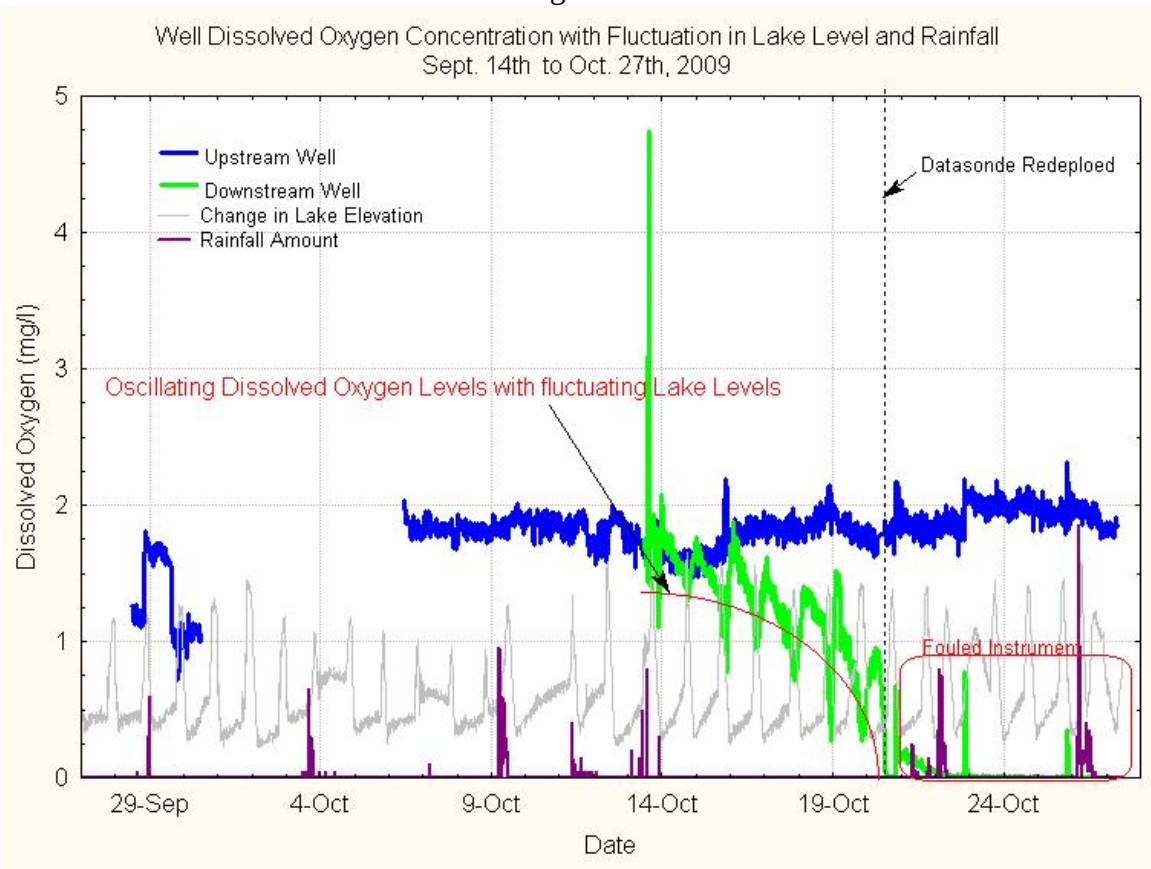
As mentioned above, water depth in the well was an important parameter to determine whether water levels in well correlated to changes in the water level of Lady Bird Lake. As stated above, the concentrations of water temperature and conductivity downstream varied with changes in lake elevation as seen in the daily oscillation in their concentrations. Lake elevation data was obtained from the Lower Colorado River Authority for Lake Levels near Longhorn Dam.

Dissolved Oxygen

Oxygen is one of the major dissolved gasses in groundwater. At the water table dissolved oxygen is already depleted to less than half the value of that which is in the air (Appelo and Postma, 2006). As a result, groundwater usually has low concentrations of DO, but it is also often colder than stream water. As depth increases the dissolved oxygen levels decrease as well.

The average dissolved oxygen concentrations for upstream and downstream wells are 1.79 mg/l and 1.20 mg/l, respectively. The 1.20 mg/l average is calculated after removing all the values collected from 10/25/2009 at 22:00 to 10/27/2009 7:45, when the DataSonde become completely fouled with silt. Again, as seen with water temperature and conductivity, the dissolved oxygen levels oscillate with fluctuations in the lake's

Figure 5



water level elevations (Figure 5) indicating that the downstream well water is being recharged by Lady Bird Lake. The same response is not seen upstream suggesting that the groundwater in that well is not similar to that in the downstream well.

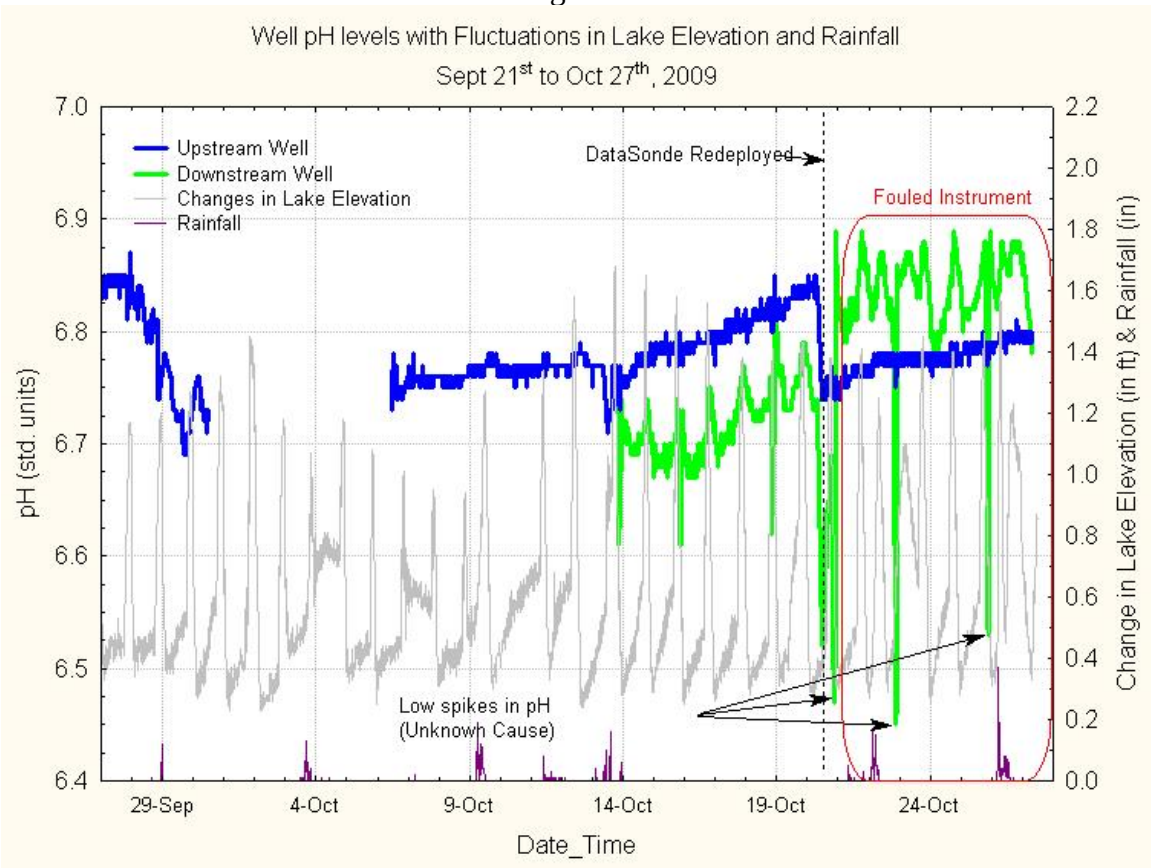
pH

The pH of groundwater is related to the rock in which the water resides. Drifts and instability in pH field measurements is attributed to three main sources: surface water from the stream flowing into the rock, instrument malfunction, and temperature imbalance between the water and the probe's electrodes (White, 1988). For example, the DataSonde is a multiprobe instrument and it is possible that the temperature probe could be fouled with sediment which would cause drift or inaccuracies in the readings.

The pH readings for both wells are shown in Figure 6. The pH reading before Oct. 21st indicated the same cyclic pattern in pH readings changing with daily fluctuations in lake

elevation. The oscillation in reading is not seen upstream also suggesting that the groundwater in that well is not similar to that in the downstream well.

Figure 6



Comprehensive Water Chemistry Monitoring of the Deep Eddy Wells

A review of the existing water chemistry data for Deep Eddy Wells revealed that very little water chemistry data has been collected at the wells. Since 1935, only four sample events have been collected from the wells prior to this investigation. All historical data is provided in Appendix B. A summary of previous sample events is listed in Table 1.

Due to lack of historical baseline data, comprehensive groundwater water samples were collected. Both wells were sampled on November 9th, 2009. The upstream well was sampled again on November 10th, 2009 with the well pump turned off to determine whether the water chemistry changed due to groundwater withdraws. The samples were analyzed using WPD's comprehensive parameter suite that included: total petroleum hydrocarbons, volatiles, semi-volatiles, bromacil, chlorinated herbicides, oil & grease, organophosphate pesticides, total suspended solids, volatile suspended solids, alkalinity, orthophosphorus, nitrate plus nitrite nitrogen, ammonia nitrogen, total organic carbon, arsenic, copper, iron, lead, nickel, zinc, calcium, magnesium, sodium, potassium, strontium, chloride, fluoride, sulfate, total hardness, total coliform and *Escherichia coli*. (E. Coli). The bacteria result is listed below in Table 2 and remaining results are list in Appendix C. As with all

Table 1

Date	Agency		Site	
	COA	TWDB	Upstream Well	Downstream Well
2/19/1941		X	X	X
8/3/1954		X		
5/16/1996	X			
3/16/2009		X	X	
09-21-2009 to 10-27-2009*	X		X	
10-12-2009 to 10-27-2009*				X
11/9/2009	X		X	X
10/10/2009	X		X	

* In-situ 15-minute monitoring
TWDB Texas Water Development Board
COA City of Austin

environmental water quality monitoring, extreme care should be used when evaluating water chemistry data from one or two sampling events. Such sampling events are snapshots of current groundwater quality for the ambient conditions present at the time of sampling. Sampling errors or lab contamination can occur during the collection or analysis of the samples yielding erroneous results. Based on the water chemistry "snapshoot" taken on November 9th and 10th, 2009, the water quality of Deep Eddy wells is what one would expect for wells in an urban area. In general, their water chemistry results are similar to levels reported at Barton and Old Mill springs. There are low levels of organic compounds, but concentrations are similar to levels reported in the Barton Springs Segment of the Edwards Aquifer by United States Geological Survey (USGS, 2006). The significant difference in concentrations between wells of NO_3+NO_2-N, total hardness, calcium (Ca^{2+}), and strontium (Sr^{2+}) supports the findings that groundwater at upstream well is from a different source or mixture of sources than that at the downstream well.

Nutrients concentrations are at normal levels for springs in the Austin area. The 0.06-mg/l concentration measured at the downstream well is skewed toward the upper end of the normal range <0.02 mg/l to 0.06 mg/l, but it is not an abnormally-high value for an urban spring. Nitrate plus nitrite nitrogen (NO_3+NO_2-N) and orthophosphate (OP) are all generally low and within the expected range for springs and wells in the Austin area. OP concentrations are at or below the detection limit of 0.02 mg/l. The NO_3+NO_2-N concentration reported is 1.81 mg/l at the upstream well and 0.3 mg/l at the downstream well. The 0.3 mg/l NO_3+NO_2-N concentration at the downstream well is comparable to levels observed in Lake Bird Lake. The 1.81 mg/l at the upstream well is within the range typically observed at Barton Springs.

Major ions and metal concentrations are also within normal ranges of values observed in the Austin area. Total hardness, calcium (Ca^{2+}), and strontium (Sr^{2+}) concentrations are

higher in the upstream well compared to the downstream well. The total hardness at the upstream well is 400 mg/l compared to 270 mg/l at the downstream well. Ca^{2+} shows a similar difference in its concentration between the wells. Since a major component of hardness is Ca^{2+}, this finding is not surprising. The calcium concentrations are 120 mg/l and 70 mg/l at the upstream and downstream wells, respectively. Strontium is a divalent cation that readily substitutes for Ca^{2+} in carbonates, sulphates, feldspars and other rock-forming minerals. Like Ca^{2+}, it participates in water-rock reactions, and is a minor component of most groundwaters. The Sr^{2+} levels are 792 μg/l and 556 μg/l at the upstream and downstream wells, respectively. At the upstream well, no significant change in Sr^{2+} levels was observed between the samples collected during groundwater withdraw (Nov.9th sample) and no withdraw periods (Nov. 10th). The difference between reported values was 0.002 μg/l. In the mid 1970, the USGS measured Sr^{2+} in lake water from Lady Bird Lake. The average Sr^{2+}concentration was 493 μg/l, relatively close to the 556 μg/l measured at the downstream well. However, additional sampling for Sr^{2+} at the lake and wells is needed to confirm this relationship. In addition, Sr^{87}/Sr^{86} isotope sampling could verify the groundwater at the downstream well is recharged by the lake and also confirm whether the groundwater upstream is recharged by leakage from the Northern Edwards Aquifer. Recent research with Sr^{87}/Sr^{86} isotopes has shown a relationship between Sr^{87}/Sr^{86} isotopes ratios and groundwater source. Water from the Edwards Aquifer has a lower concentration compared to water from Colorado River (Garcia-Fresca, B., 2004).

Total coliform and *Escherichia coli* measurements from both well, the pool and lake are listed in Table 3.

Table 3

Site	E coli	Total Coliform
Deep Eddy Downstream Well	<1	111.2
Deep Eddy Pool	<1	8.5
Deep Eddy Upstream Well	<1	27.9
Town Lake @ Deep Eddy	198.9	>2419.6

The results show very low levels of bacteria in the wells and pool. The downstream well's levels are slightly higher than those of the upstream well. The elevated level is attributed to the fact that water downstream is recharged by the lake. It appears that the clay, silt, sands, and gravel of the Riverview deposit filter a large percentage (but not all) of the bacteria out of the lake water recharging the well.

A suite of 8 chlorinated herbicides and 9 organophosphate pesticides were analyzed. No pesticides or herbicides were detected.

A suite of 57 volatile organic compounds (VOC) and 94 semivolatile compounds (SVOC) was analyzed at both wells. Three VOCs; chloromethane, chloroform, and trichloroethylene (TCE) were reported as an "estimate" because, in environmental laboratory terminology, it is above the analysis method detection limit (MDL) and below the practicable quantitation limit (PQL). This means that there are extremely low concentrations present in the sample, but there is a higher degree of uncertainty in regards to the level reported. Bis(2-ethylhexyl)phthalate was detected at 12.8 μg/l in the

downstream well. This was the only SVOC detected. However, the VOCs and SVOCs are also common lab contaminants, so additional conformation sampling should be completed to confirm the results.

Total petroleum hydrocarbons were analyzed using Texas Commission for Environmental Quality method 1005-TPH. The two values reported are for carbon ranges C6-C12 and >C28-C35 at 0.6 mg/l and 0.7mg/l, respectively. The C6-C12 carbon range is associated with hydrocarbons such as gasoline, naphthas, stoddard solvent and kerosene/jet fuel. The >C28 to C35 hydrocarbons are typical lubricating oils like motor oil and grease. The TCEQ 1005 analysis method yielded similar reporting values at Barton, Eliza, and Old Mills springs from 2002 to 2009. This level is not unusual for wells and springs in urban settings.

Discussion

Understanding the site geology and the response of the underlying aquifer to groundwater withdraws is important in understanding the site's hydrology. The type of rock, the layering of rock units (stratigraphy), the faulting and folding of underlying rocks all can influence the movement and storage of groundwater. Wells completed in unconfined shallow alluvial aquifers like at Deep Eddy have a cone of depression that expands very slowly, because the storage equals the specific yield of aquifer material. On the other hand, dewatering of the aquifer results in a decrease in the transmissivity of the water, which, in turn, causes an increase in drawdown both in the well and the aquifer. As a result, the wells are susceptible to over-pumping and droughts. In addition, shallow aquifers and wells are more susceptible to contamination due to close proximity anthropogenic sources such as urbanization.

The biggest problem with understanding Deep Eddy's site hydrology is that not much research has been completed on the shallow groundwater systems or the Northern Edwards Aquifer in the West Central Austin area. The in-situ and comprehensive monitoring of the Deep Eddy wells provides us with some insight into the shallow aquifer system, but additional investigations of the water quality and hydrology of the groundwater in this area are needed.

The in-situ water chemistry monitoring clearly indicates that the lower alluvial deposit, the Riverview and Sand Beach deposits, are recharged by Lady Bird Lake as shown in the oscillation of water temperature, conductivity, pH, and dissolved oxygen. In addition, the concentration of these constituents was found to be different between the upstream and downstream wells.

The limited comprehensive water chemistry data also indicates that the source of groundwater is different for the two wells and that the groundwater at Deep Eddy shows no sign of impacts to the water quality at the wells other than what we would normally expect from any urban well. The future of groundwater quality at Deep Eddy is unknown; impacts to its water quality from the pressures of urbanization will continue. Routine monitoring of the wells should be considered.

It is recommended that, conformation sampling be completed and, if necessary, routine monitoring of both wells to verify the low-level VOC and SVOC detections. Although

not a high priority, Sr^{87}/Sr^{86} isotope sampling could verify groundwater at the downstream well is recharged by the lake.

Due to the lack of subsurface geologic information for the alluvial deposits and underlying Edwards Formation, the completion of 3 to 6 geotechnical bores within the park will provide additional information to aid an investigation as to whether a deeper water supply source is present. Conversion of the one or two bore holes to piezometers would provide much need data on the water quality of the deeper Edwards Aquifer.

A decision matrix should be developed by the City and interested stake holders to discuss all possible options. An important factor to consider is the type of filtration system for the pool. In addition, shallow groundwater and surface water are at great risk from impacts to their quality and quantity due to the effects of urbanization. During times of drought, this water supply may not be available or may be of poor quality. Construction of a well or wells into the deeper Edwards may provide a more stable water supply. However, the water quality and quantity of this aquifer in the West Central Austin area is poorly understood. Little to no water quality information exists for these aquifers in this area. It is possible that existing urbanization has already reduced the recharge to these aquifers and impacted their water quality. Additional hydrological studies will be needed. Converting the pool to a closed system with nonchlorinate filtration would offer one option that would better reflect water conservation goals. The water supply in the pool could be derived from a single or combination of water sources that included City drinking water, shallow groundwater, deep groundwater, and lake water. Several nonchlorinate filtration systems exist and include but are not limited to Biguanide with Hydrogen Peroxide, ozone, and UV Systems. An innovative new pool filtration system could respond better to changing water supplies during future droughts.

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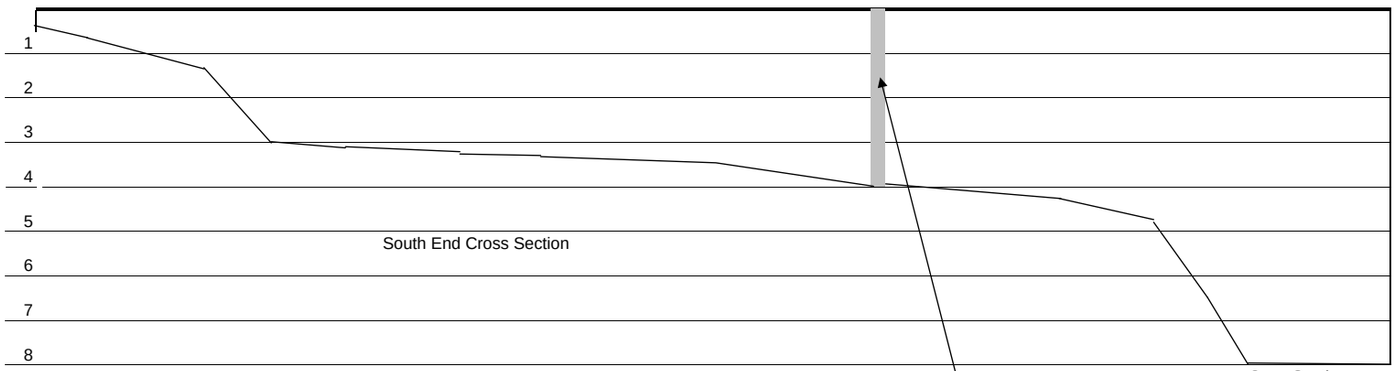
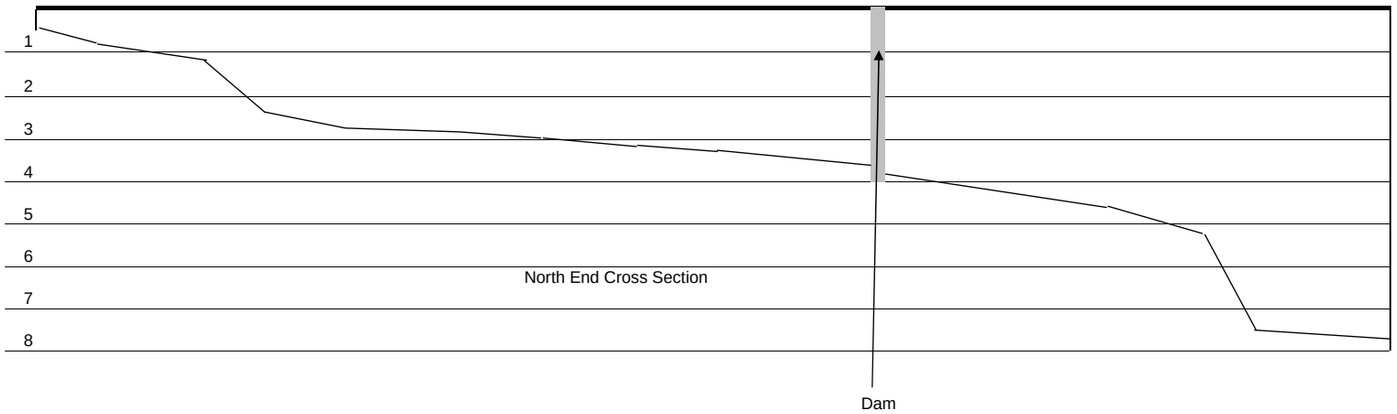
Appendix A

Deep Eddy Pool Volume Well Pumpage Rate Calculations



	198	ft
	195	ft
	177	ft
	172	ft
	169	ft
	167	ft
	136	ft
	84	ft
	50	ft
	36	ft
	33	ft
	31	ft
	29	ft
	27	ft
	25	ft
	22	ft
CrossSection area	776	ft2
Volume for pool (based 100-ft width)	77,550	ft3
	580,114	gal
Deep End Volume	319,044	gal

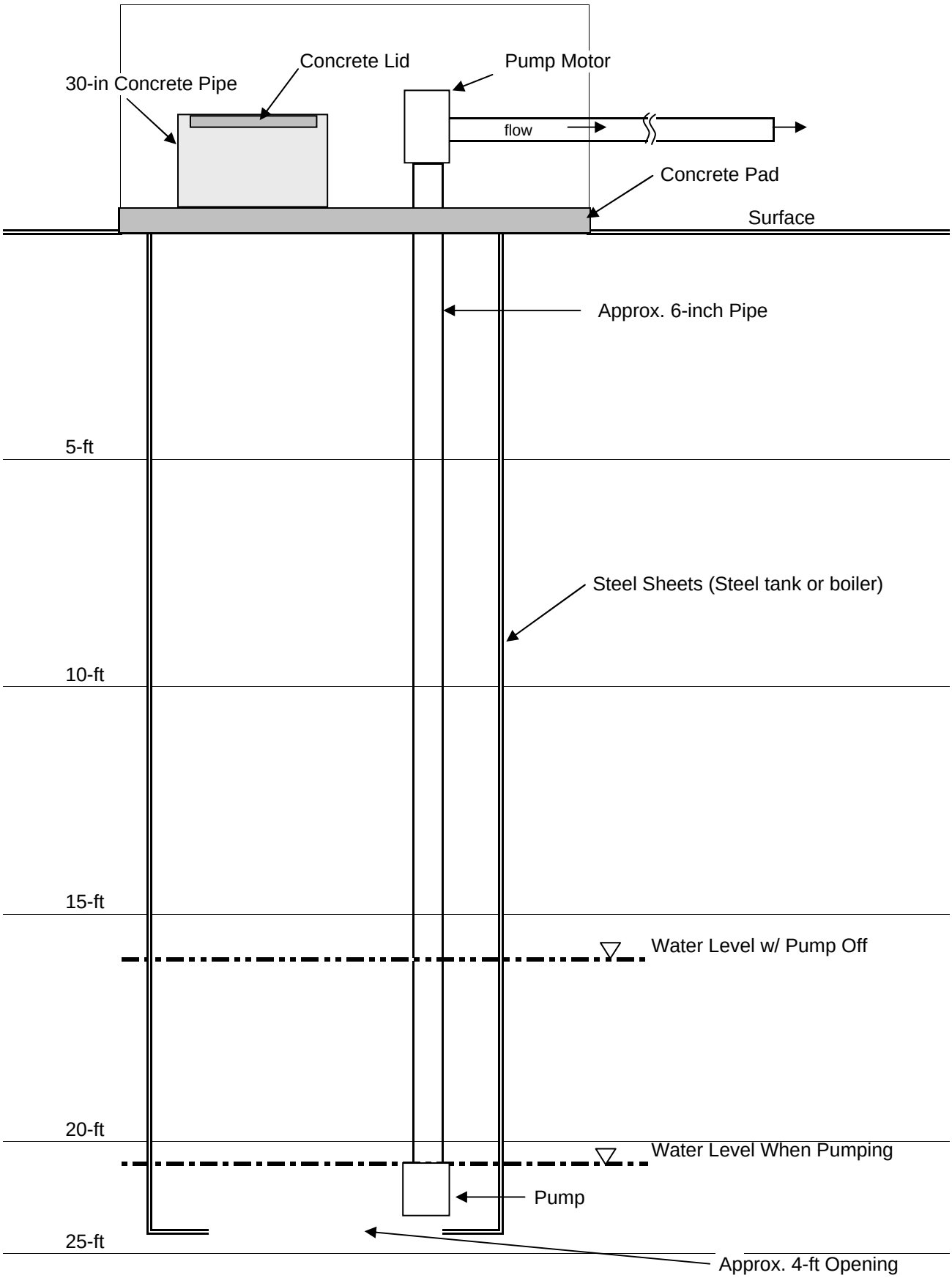
Deep Eddy Pool Volume Well Pumpage Rate Calculations



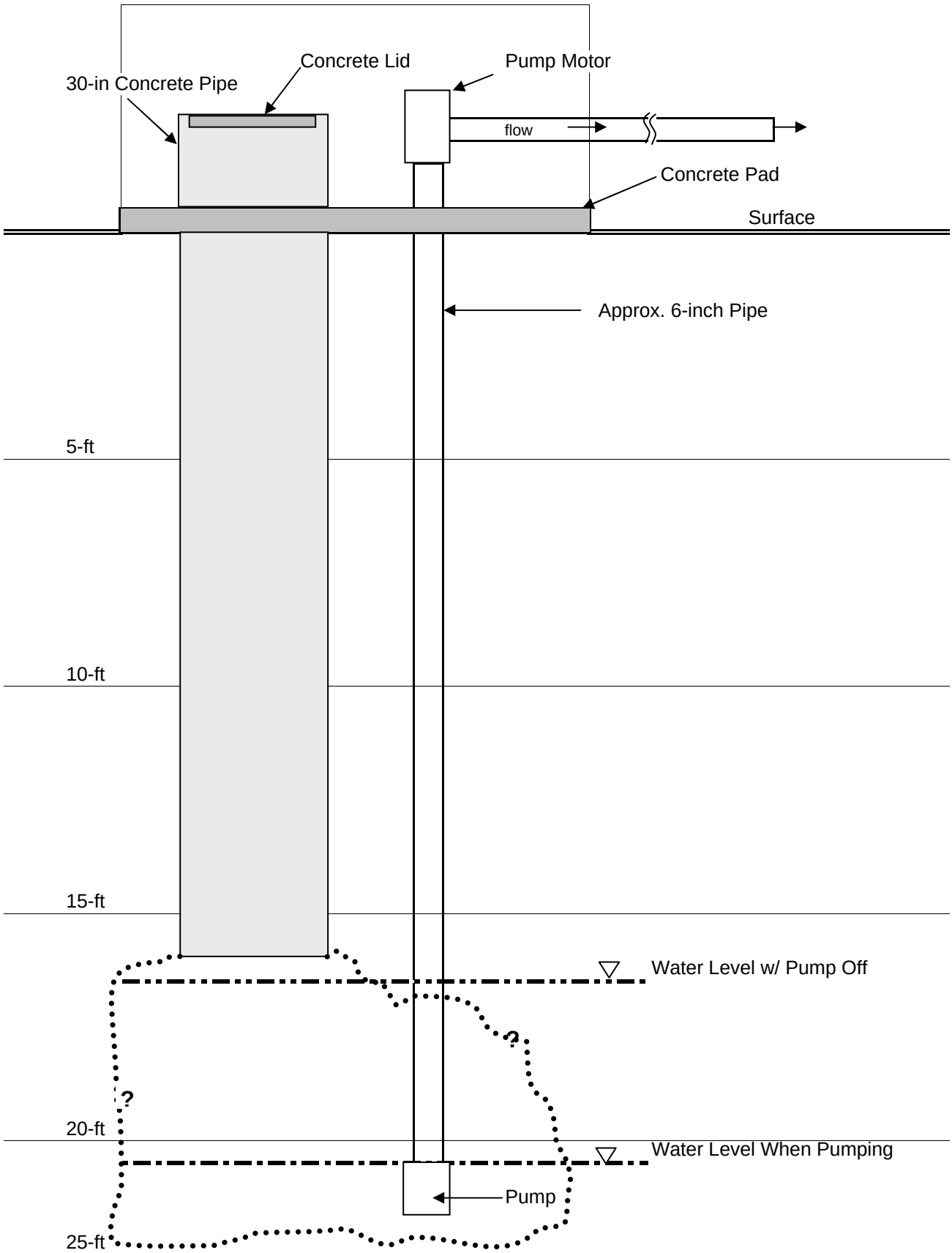
	198	ft
	195	ft
	174	ft
	170	ft
	166	ft
	151	ft
	98	ft
	75	ft
	50	ft
	36	ft
	28	ft
	26	ft
	24	ft
	22	ft
	21	ft
	0	ft
	717	ft2
	71,700	ft3
	536,353	gal
Deep End Volume	301,838	gal
Total Pool Volume	74,625	ft3
	558,233	gal
Deep End Volume	310,441	gal
Shallow End Volume	247,792	gal
Collectively Both Well's Est. Pumping Rate	517	gpm
Est. Pumping Rate per Well	259	gpm

**** Based on report 10-hr Pool fill time for The Deep End***

Deep Eddy Downstream Well General Schematic



Deep Eddy Upstream Well General Schematic



Appendix B

Texas Water Development Board Water Chemistry Data - WIID Website

http://wiid.twdb.state.tx.us/ims/wwm_drl/viewer.htm?DISCL=1

Upstream Well

No.	STATE WELL NUMBER	MONTH	DAY	YEAR	SAMPLE NUMBER	SAMPLE TIME	TEMPERATURE CELSIUS	TOP OF SAMPLED INTERVAL	BOTTOM OF SAMPLED INTERVAL	SAMPLED INTERVAL AQUIFER CODE	COLLECTION REMARKS	RELIABILITY REMARK	COLLECTING AGENCY	LAB CODE	BALANCED / UNBALANCED	SILICA MG/L	CALCIUM MG/L	MAGNESIUM MG/L	SODIUM MG/L	POTASSIUM MG/L	STRONTIUM MG/L
1	5842904	8	3	1954	1							4	3	2	U						
2	5842904	3	16	2009	1	1045	22				FAW	10	1	23	B	14.4	102	23.7	31.5	2.84	0.73

No.	STATE WELL NUMBER	MONTH	DAY	YEAR	SAMPLE NUMBER	SAMPLE TIME	CARBONATE MG/L	BICARBONATE MG/L	SULFATE MG/L	CHLORIDE MG/L	FLUORIDE MG/L	NITRATE ION MG/L	PH	TDS MG/L	PHENOLPHTHALEIN ALKALINITY	TOTAL ALKALINITY	TOTAL HARDNESS	PERECNT SODIUM	SAR	RSC	SPECIFIC CONDUCTANCE
1	5842904	8	3	1954	1		0	161	39				8.2		0	131.93					420
2	5842904	3	16	2009	1	1045	0	360	44.6	46.5	0.34	6.68	6.96	450	< 0	295	353	16	0.73	0	796

1.52 Nitrate-nitrogen

No.	STATE WELL NUMBER	PUBLISHABLE/ NON-PUBLISHABLE	DEPTH FROM LAND SURFACE	MONTH	DAY	YEAR	MEASUREMENT NUMBER	MEASURING AGENCY	METHOD OF MEASUREMENT	REMARK
1	5842904	P	-16.6	2	19	1941	1			

No.	STATE WELL NUMBER	REMARKS 1	REMARKS 2
1	5842904	Supplies swimming pool. Well H-67	in 1957 Travis County report.

No.	STATE WELL NUMBER	MONTH	DAY	YEAR	SAMPLE NUMBER	STORET CODE*	VALUE	PLUS MINUS
1	5842904	3	16	2009	1	TEMPERATURE, WATER (CELSIUS)	21.6	
2	5842904	3	16	2009	1	NITRITE PLUS NITRATE, DISSOLVED (MG/L AS N)	1.51	
3	5842904	3	16	2009	1	ARSENIC, DISSOLVED (UG/L AS AS)	< 2.04	
4	5842904	3	16	2009	1	BARIUM, DISSOLVED (UG/L AS BA)	112	
5	5842904	3	16	2009	1	BERYLLIUM, DISSOLVED (UG/L AS BE)	< 1.02	
6	5842904	3	16	2009	1	BORON, DISSOLVED (UG/L AS B)	105	
7	5842904	3	16	2009	1	CADMIUM, DISSOLVED (UG/L AS CD)	< 1.02	
8	5842904	3	16	2009	1	CHROMIUM, DISSOLVED (UG/L AS CR)	4.72	
9	5842904	3	16	2009	1	COBALT, DISSOLVED (UG/L AS CO)	< 1.02	
10	5842904	3	16	2009	1	COPPER, DISSOLVED (UG/L AS CU)	5.18	
11	5842904	3	16	2009	1	IRON, DISSOLVED (UG/L AS FE)	< 51	
12	5842904	3	16	2009	1	LEAD, DISSOLVED (UG/L AS PB)	1.53	
13	5842904	3	16	2009	1	MANGANESE, DISSOLVED (UG/L AS MN)	37.1	
14	5842904	3	16	2009	1	THALLIUM, DISSOLVED (UG/L AS TL)	< 1.02	
15	5842904	3	16	2009	1	MOLYBDENUM, DISSOLVED, UG/L	1.70	
16	5842904	3	16	2009	1	SILVER, DISSOLVED (UG/L AS AG)	1.89	
17	5842904	3	16	2009	1	STRONTIUM, DISSOLVED (UG/L AS SR)	727	
18	5842904	3	16	2009	1	VANADIUM, DISSOLVED (UG/L AS V)	3.05	
19	5842904	3	16	2009	1	ZINC, DISSOLVED (UG/L AS ZN)	7.18	
20	5842904	3	16	2009	1	ANTIMONY, DISSOLVED (UG/L AS SB)	< 1.02	
21	5842904	3	16	2009	1	ALUMINUM, DISSOLVED (UG/L AS AL)	< 4.08	
22	5842904	3	16	2009	1	LITHIUM, DISSOLVED (UG/L AS LI)	16.2	
23	5842904	3	16	2009	1	SELENIUM, DISSOLVED (UG/L AS SE)	< 4.08	
24	5842904	3	16	2009	1	ALPHA, DISSOLVED (PC/L)	15	8
25	5842904	3	16	2009	1	URANIUM, NATURAL, DISSOLVED, UG/L	< 1.02	
26	5842904	3	16	2009	1	ALKALINITY, FIELD, DISSOLVED AS CACO3	330	
27	5842904	3	16	2009	1	ANION/CATION RATIO BALANCE	1.85	
28	5842904	3	16	2009	1	BROMIDE, DISSOLVED, (MG/L AS BR)	0.24	
29	5842904	3	16	2009	1	MERCURY, DISSOLVED (UG/L AS HG)	< 0.200	

Downstream Well

No.	STATE WELL NUMBER	PUBLISHABLE/ NON-PUBLISHABLE	DEPTH FROM LAND SURFACE	MONTH	DAY	YEAR	MEASUREMENT NUMBER	MEASURING AGENCY	METHOD OF MEASUREMENT	REMARK
1	5842906	P	-14.1	2	19	1941	1			

No.	STATE WELL NUMBER	REMARKS 1	REMARKS 2
1	5842906	Dug well. Supplies swimming pool.	Well H-66 in 1957 Travis County
2	5842906	report.	

City of Austin -Watershed Protection Department Water Chemistry Data

Upstream Well

REF NO	VISIT DATE	SAMPLE TIME	SAMPLE SITE NO	SITE TYPE	SITE NAME	SAMPLE TYPE	SAMPLE ID	LAB	PARAMETER	Q	RESULT	UNIT	FILTER	METHOD	QC FLAG
17819	15-May-96	1015	759	Well	Deep Eddy Well	Grab	DEW960515	WWW	ALKALINITY (AS CACO3)		150	MG/L	Total	SM 2320 B	S
17483	15-May-96	1015	759	Well	Deep Eddy Well	field measurement	DEW960515	Field	PH		7.08	Standard units	N/A	HORIBA WATER QUALITY METER	U
17819	15-May-96	1015	759	Well	Deep Eddy Well	Grab	DEW960515	WWW	FECAL COLIFORM BACTERIA	<	1	Colonies/100mL	N/A	SM 9222 D	U
17819	15-May-96	1015	759	Well	Deep Eddy Well	Grab	DEW960515	WWW	ORGANIC CARBON	<	1	MG/L	Total	SM 5310 B	U
17483	15-May-96	1015	759	Well	Deep Eddy Well	field measurement	DEW960515	Field	TURBIDITY		0	NTU	N/A	HORIBA WATER QUALITY METER	U
17483	15-May-96	1015	759	Well	Deep Eddy Well	field measurement	DEW960515	Field	WATER TEMPERATURE		21.7	Deg. Celsius	N/A	HORIBA WATER QUALITY METER	U
20478	15-May-96	1015	759	Well	Deep Eddy Well	Grab	DEW960515	NDRC	CALCIUM		90.9	MG/L	Total	EPA 200.7	U
17819	15-May-96	1015	759	Well	Deep Eddy Well	Grab	DEW960515	WWW	CHLORIDE		52.9	MG/L	Total	EPA 300	U
17819	15-May-96	1015	759	Well	Deep Eddy Well	Grab	DEW960515	WWW	FLUORIDE		0.36	MG/L	Total	SM 4500-F	U
20478	15-May-96	1015	759	Well	Deep Eddy Well	Grab	DEW960515	NDRC	MAGNESIUM		21.1	MG/L	Total	EPA 200.7	U
20478	15-May-96	1015	759	Well	Deep Eddy Well	Grab	DEW960515	NDRC	POTASSIUM		2.88	MG/L	Total	EPA 200.7	U
20478	15-May-96	1015	759	Well	Deep Eddy Well	Grab	DEW960515	NDRC	SODIUM		37.4	MG/L	Total	EPA 200.7	U
17819	15-May-96	1015	759	Well	Deep Eddy Well	Grab	DEW960515	WWW	SULFATE		48	MG/L	Total	EPA 300	U
17819	15-May-96	1015	759	Well	Deep Eddy Well	Grab	DEW960515	WWW	ARSENIC	<	5	UG/L	Total	EPA 206.2	U
17819	15-May-96	1015	759	Well	Deep Eddy Well	Grab	DEW960515	WWW	COPPER	<	2	UG/L	Total	EPA 220.2	U
17819	15-May-96	1015	759	Well	Deep Eddy Well	Grab	DEW960515	WWW	IRON		0.053	MG/L	Total	EPA 236.1	U
17819	15-May-96	1015	759	Well	Deep Eddy Well	Grab	DEW960515	WWW	LEAD		1	UG/L	Total	EPA 239.2	U
17819	15-May-96	1015	759	Well	Deep Eddy Well	Grab	DEW960515	WWW	NICKEL	<	0.01	MG/L	Total	EPA 249.1	U
17819	15-May-96	1015	759	Well	Deep Eddy Well	Grab	DEW960515	WWW	AMMONIA AS N	<	0.02	MG/L	Total	SM 4500-NH3 F	U
17819	15-May-96	1015	759	Well	Deep Eddy Well	Grab	DEW960515	WWW	NITRATE/NITRITE AS N		1.54	MG/L	Total	EPA 353.2	U
17819	15-May-96	1015	759	Well	Deep Eddy Well	Grab	DEW960515	WWW	ORTHOPHOSPHORUS AS P		0.03	MG/L	Total	SM 4500-P E	R
17819	15-May-96	1015	759	Well	Deep Eddy Well	Grab	DEW960515	WWW	PHOSPHORUS AS P	<	0.02	MG/L	Total	SM 4500-P BE	R
17819	15-May-96	1015	759	Well	Deep Eddy Well	Grab	DEW960515	WWW	TOTAL KJELDAHL NITROGEN AS N		0.15	MG/L	Total	EPA 351.4	U
17483	15-May-96	1015	759	Well	Deep Eddy Well	field measurement	DEW960515	Field	DISSOLVED OXYGEN		3.6	MG/L	Dissolved	HORIBA WATER QUALITY METER	U
17483	15-May-96	1015	759	Well	Deep Eddy Well	field measurement	DEW960515	Field	CONDUCTIVITY		726	uS/cm	N/A	HORIBA WATER QUALITY METER	U
17819	15-May-96	1015	759	Well	Deep Eddy Well	Grab	DEW960515	WWW	TOTAL SUSPENDED SOLIDS	<	0.5	MG/L	Suspended	SM 2540 D	U

Deep Eddy Pool - Deep End

REF NO	VISIT DATE	SAMPLE TIME	SAMPLE SITE NO	SITE TYPE	SITE NAME	SAMPLE TYPE	SAMPLE ID	LAB	PARAMETER	Q	RESULT	UNIT	FILTER	METHOD	QC FLAG
218136	27-Jan-03	1320		Well	Deep Eddy Pool	Grab	Deep End, Pool	DHL	ARSENIC	<	10	UG/L	Total	EPA 6020	U
218136	27-Jan-03	1320		Well	Deep Eddy Pool	Grab	Deep End, Pool	DHL	CADMIUM	<	1	UG/L	Total	EPA 6020	U
218136	27-Jan-03	1320		Well	Deep Eddy Pool	Grab	Deep End, Pool	DHL	COPPER	<	10	UG/L	Total	EPA 6020	U
218136	27-Jan-03	1320		Well	Deep Eddy Pool	Grab	Deep End, Pool	DHL	LEAD	<	3	UG/L	Total	EPA 6020	U
218136	27-Jan-03	1320		Well	Deep Eddy Pool	Grab	Deep End, Pool	DHL	MERCURY	<	0.2	UG/L	Total	EPA 7470A	U
218136	27-Jan-03	1320		Well	Deep Eddy Pool	Grab	Deep End, Pool	DHL	ZINC	<	10	UG/L	Total	EPA 6020	U
218136	27-Jan-03	1320		Well	Deep Eddy Pool	Grab	Deep End, Pool	DHL	ACENAPHTHENE	<	0.2	UG/L	Total	EPA 8270C	U
218136	27-Jan-03	1320		Well	Deep Eddy Pool	Grab	Deep End, Pool	DHL	ACENAPHTHYLENE	<	0.2	UG/L	Total	EPA 8270C	U
218136	27-Jan-03	1320		Well	Deep Eddy Pool	Grab	Deep End, Pool	DHL	ANTHRACENE	<	0.2	UG/L	Total	EPA 8270C	U
218136	27-Jan-03	1320		Well	Deep Eddy Pool	Grab	Deep End, Pool	DHL	BENZO(A)ANTHRACENE	<	0.2	UG/L	Total	EPA 8270C	U
218136	27-Jan-03	1320		Well	Deep Eddy Pool	Grab	Deep End, Pool	DHL	BENZO(A)PYRENE	<	0.2	UG/L	Total	EPA 8270C	U
218136	27-Jan-03	1320		Well	Deep Eddy Pool	Grab	Deep End, Pool	DHL	BENZO(B)FLUORANTHENE	<	0.2	UG/L	Total	EPA 8270C	U
218136	27-Jan-03	1320		Well	Deep Eddy Pool	Grab	Deep End, Pool	DHL	BENZO(GHI)PERYLENE	<	0.2	UG/L	Total	EPA 8270C	U
218136	27-Jan-03	1320		Well	Deep Eddy Pool	Grab	Deep End, Pool	DHL	BENZO(K)FLUORANTHENE	<	0.2	UG/L	Total	EPA 8270C	U
218136	27-Jan-03	1320		Well	Deep Eddy Pool	Grab	Deep End, Pool	DHL	CHRYSENE	<	0.2	UG/L	Total	EPA 8270C	U
218136	27-Jan-03	1320		Well	Deep Eddy Pool	Grab	Deep End, Pool	DHL	DIBENZ(AH)ANTHRACENE	<	0.2	UG/L	Total	EPA 8270C	U
218136	27-Jan-03	1320		Well	Deep Eddy Pool	Grab	Deep End, Pool	DHL	FLUORANTHENE	<	0.2	UG/L	Total	EPA 8270C	U
218136	27-Jan-03	1320		Well	Deep Eddy Pool	Grab	Deep End, Pool	DHL	FLUORENE (9H-FLUORENE)	<	0.2	UG/L	Total	EPA 8270C	U
218136	27-Jan-03	1320		Well	Deep Eddy Pool	Grab	Deep End, Pool	DHL	INDENO(1_2_3-CD)PYRENE	<	0.2	UG/L	Total	EPA 8270C	U
218136	27-Jan-03	1320		Well	Deep Eddy Pool	Grab	Deep End, Pool	DHL	NAPHTHALENE	<	0.2	UG/L	Total	EPA 8270C	U
218136	27-Jan-03	1320		Well	Deep Eddy Pool	Grab	Deep End, Pool	DHL	PAH (POLYCYCLIC AROMATIC HYDROCARBONS)		0.0012	MG/L	N/A	Sediment Quality Guideline PAHs (13	U
218136	27-Jan-03	1320		Well	Deep Eddy Pool	Grab	Deep End, Pool	DHL	PAH (POLYCYCLIC AROMATIC HYDROCARBONS)	<	0.0032	MG/L	N/A	Total PAH by COA Method (16 parame	U
218136	27-Jan-03	1320		Well	Deep Eddy Pool	Grab	Deep End, Pool	DHL	PHENANTHRENE	<	0.2	UG/L	Total	EPA 8270C	U
218136	27-Jan-03	1320		Well	Deep Eddy Pool	Grab	Deep End, Pool	DHL	PYRENE	<	0.2	UG/L	Total	EPA 8270C	U

Appendix C

Final Analysis Report

LCRA Environmental Laboratory Services

Date: *23-Nov-09*

CLIENT: COA WPDR
Lab Order: 0911234
Project: Emergency Investigations
Lab ID: 0911234-001

Client Sample ID: 759-Deep Eddy Well U/S
Collection Date: 11/9/2009 10:40:00 AM
Matrix: GROUNDWATER
Tag No:

Analyses	Result	Qual	MDL	PQL	Units	DF	Date Analyzed
ORGANOPHOSPHORUS PESTICIDES			**SW8141A**		**(SW3520C)**		Analyst: **BC**
Ethyl Parathion	< 0.11		0.11	0.50	µg/L	1	11/12/2009 6:32:11 PM
Methyl parathion	< 0.13		0.13	0.50	µg/L	1	11/12/2009 6:32:11 PM
Azinphosmethyl	< 0.11		0.11	0.50	µg/L	1	11/12/2009 6:32:11 PM
Chloropyrifos	< 0.09		0.09	0.50	µg/L	1	11/12/2009 6:32:11 PM
Demeton, Total	< 0.17		0.17	0.50	µg/L	1	11/12/2009 6:32:11 PM
Demeton-O	< 0.15		0.15	0.50	µg/L	1	11/12/2009 6:32:11 PM
Demeton-S	< 0.13		0.13	0.50	µg/L	1	11/12/2009 6:32:11 PM
Diazinon	< 0.10		0.10	0.50	µg/L	1	11/12/2009 6:32:11 PM
Malathion	< 0.09		0.09	0.50	µg/L	1	11/12/2009 6:32:11 PM
Surr: Phorate	89.8		0	70-130	%REC	1	11/12/2009 6:32:11 PM
Surr: Triphenyl Phosphate	106		0	70-130	%REC	1	11/12/2009 6:32:11 PM
CHLORINATED HERBICIDES			**SW8151A**		**(SW8151A)**		Analyst: **CO**
2,4,5-T	< 0.17		0.17	0.50	µg/L	1	11/18/2009 1:05:30 PM
2,4,5-TP (Silvex)	< 0.19		0.19	0.50	µg/L	1	11/18/2009 1:05:30 PM
2,4-D	< 0.12		0.12	0.50	µg/L	1	11/18/2009 1:05:30 PM
Dalapon	< 0.17		0.17	0.50	µg/L	1	11/18/2009 1:05:30 PM
Dicamba	< 0.16		0.16	0.50	µg/L	1	11/18/2009 1:05:30 PM
Dinoseb	< 0.21		0.21	0.50	µg/L	1	11/18/2009 1:05:30 PM
Pentachlorophenol	< 0.15		0.15	0.50	µg/L	1	11/18/2009 1:05:30 PM
Picloram	< 0.11		0.11	0.50	µg/L	1	11/18/2009 1:05:30 PM
Surr: 2,4-DB	125		0.07	70-130	%REC	1	11/18/2009 1:05:30 PM
TNRCC METHOD 1005-TPH			**TX1005**		**(TX1005)**		Analyst: **SM**
>C12-C28	< 0.5	A	0.5	4.5	mg/L	1	11/19/2009 5:35:37 PM
>C28-C35	0.7	JA	0.1	4.5	mg/L	1	11/19/2009 5:35:37 PM
C6-C12	0.6	JA	0.5	4.5	mg/L	1	11/19/2009 5:35:37 PM
C6-C35	< 0.6		0.6	4.5	mg/L	1	11/19/2009 5:35:37 PM
Surr: a,a,a-Trifluorotoluene	99.7		0	70-130	%REC	1	11/19/2009 5:35:37 PM
Surr: o-Terphenyl	80.6		0	70-130	%REC	1	11/19/2009 5:35:37 PM
ICP METALS, TOTAL RECOVERABLE			**E200.7**				Analyst: **MV**
Calcium	120		0.0260	0.200	mg/L	1	11/16/2009 12:42:22 PM
Iron	0.0205	J	0.00290	0.0500	mg/L	1	11/16/2009 12:42:22 PM
Magnesium	25.1		0.0117	0.200	mg/L	1	11/16/2009 12:42:22 PM
Potassium	3.54		0.0537	0.200	mg/L	1	11/16/2009 12:42:22 PM
Sodium	37.1		0.0200	0.600	mg/L	1	11/16/2009 12:42:22 PM
ICPMS METALS, TOTAL RECOVERABLE			**E200.8**				Analyst: **SW**
Arsenic	1.07	J	0.643	2.00	µg/L	1	11/12/2009 11:26:30 AM

Qualifiers:

A Not Available for Accreditation
E Value Above Quantitation Range
N Not Accredited
X Value Exceeds Maximum Contaminant Level (MCL)
B Analyte Detected in Method Blank
H Holding Time Exceeded
S Spike Recovery Outside Recovery Limits

PQL: Practical Quantitation Limit

LCRA Environmental Laboratory Services

Date: *23-Nov-09*

CLIENT:	COA WPDR	**Client Sample ID:**	759-Deep Eddy Well U/S
Lab Order:	0911234	**Collection Date:**	11/9/2009 10:40:00 AM
Project:	Emergency Investigations	**Matrix:**	GROUNDWATER
Lab ID:	0911234-001	**Tag No:**	

Analyses	Result	Qual	MDL	PQL	Units	DF	Date Analyzed
ICPMS METALS, TOTAL RECOVERABLE			**E200.8**				Analyst: **SW**
Copper	0.668	J	0.086	2.00	µg/L	1	11/12/2009 11:26:30 AM
Lead	< 0.087		0.087	1.00	µg/L	1	11/12/2009 11:26:30 AM
Nickel	3.69		0.122	2.00	µg/L	1	11/12/2009 11:26:30 AM
Strontium	792		0.430	10.0	µg/L	10	11/12/2009 12:29:53 PM
Zinc	< 1.29		1.29	5.00	µg/L	1	11/12/2009 11:26:30 AM
HARDNESS, TOTAL			**SM2340 B**				Analyst: **MV**
Hardness, Calcium/Magnesium (As CaCO3)	404		0.065	1.32	mg/L	1	11/16/2009
ORGANIC COMPOUNDS			**E525.2**		**(E525.2)**		Analyst: **SG**
Bromacil	< 0.0409	A	0.0409	0.208	µg/L	1	11/12/2009 6:09:00 PM
Surr: 1,3-Dimethyl-2-nitrobenzene	95.0		0	70-130	%REC	1	11/12/2009 6:09:00 PM
Surr: Perylene-d12	78.6		0	70-130	%REC	1	11/12/2009 6:09:00 PM
Surr: Pyrene-d10	100		0	70-130	%REC	1	11/12/2009 6:09:00 PM
Surr: Triphenyl Phosphate	104		0	70-130	%REC	1	11/12/2009 6:09:00 PM
SEMIVOLATILE ORGANICS			**SW8270C**		**(SW3520C)**		Analyst: **CO**
1&2-Chloronaphthalene	< 1.27	A	1.27	10.0	µg/L	1	11/13/2009 4:53:00 AM
1,2,4,5-Tetrachlorobenzene	< 0.617		0.617	10.0	µg/L	1	11/13/2009 4:53:00 AM
1,2,4-Trichlorobenzene	< 0.585		0.585	5.00	µg/L	1	11/13/2009 4:53:00 AM
1,2-Dichlorobenzene	< 0.711		0.711	5.00	µg/L	1	11/13/2009 4:53:00 AM
1,2-Diphenylhydrazine	< 0.553		0.553	5.00	µg/L	1	11/13/2009 4:53:00 AM
1,3-Dichlorobenzene	< 0.764		0.764	5.00	µg/L	1	11/13/2009 4:53:00 AM
1,4-Dichlorobenzene	< 0.871		0.871	5.00	µg/L	1	11/13/2009 4:53:00 AM
1-Naphthylamine	< 0.932	A	0.932	10.0	µg/L	1	11/13/2009 4:53:00 AM
2,3,4,6-Tetrachlorophenol	< 1.19		1.19	10.0	µg/L	1	11/13/2009 4:53:00 AM
2,4,5-Trichlorophenol	< 0.861		0.861	6.00	µg/L	1	11/13/2009 4:53:00 AM
2,4,6-Trichlorophenol	< 0.614		0.614	5.00	µg/L	1	11/13/2009 4:53:00 AM
2,4-Dichlorophenol	< 0.768		0.768	5.00	µg/L	1	11/13/2009 4:53:00 AM
2,4-Dimethylphenol	< 0.785		0.785	5.00	µg/L	1	11/13/2009 4:53:00 AM
2,4-Dinitrophenol	< 1.12		1.12	50.0	µg/L	1	11/13/2009 4:53:00 AM
2,4-Dinitrotoluene	< 0.627		0.627	10.0	µg/L	1	11/13/2009 4:53:00 AM
2,6-Dichlorophenol	< 0.492		0.492	5.00	µg/L	1	11/13/2009 4:53:00 AM
2,6-Dinitrotoluene	< 0.712		0.712	5.00	µg/L	1	11/13/2009 4:53:00 AM
2-Chlorophenol	< 0.606		0.606	5.00	µg/L	1	11/13/2009 4:53:00 AM
2-Methylnaphthalene	< 0.542		0.542	5.00	µg/L	1	11/13/2009 4:53:00 AM
2-Methylphenol	< 0.633		0.633	5.00	µg/L	1	11/13/2009 4:53:00 AM
2-Naphthylamine	< 0.562		0.562	5.00	µg/L	1	11/13/2009 4:53:00 AM
2-Nitroaniline	< 0.929		0.929	5.00	µg/L	1	11/13/2009 4:53:00 AM
2-Nitrophenol	< 0.534		0.534	5.00	µg/L	1	11/13/2009 4:53:00 AM
2-Picoline	< 0.766		0.766	5.00	µg/L	1	11/13/2009 4:53:00 AM

Qualifiers:

A Not Available for Accreditation
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N Not Accredited
X Value Exceeds Maximum Contaminant Level (MCL)
B Analyte Detected in Method Blank
H Holding Time Exceeded
S Spike Recovery Outside Recovery Limits

PQL: Practical Quantitation Limit

LCRA Environmental Laboratory Services

Date: *23-Nov-09*

CLIENT: COA WPDR
Lab Order: 0911234
Project: Emergency Investigations
Lab ID: 0911234-001

Client Sample ID: 759-Deep Eddy Well U/S
Collection Date: 11/9/2009 10:40:00 AM
Matrix: GROUNDWATER
Tag No:

Analyses	Result	Qual	MDL	PQL	Units	DF	Date Analyzed
SEMIVOLATILE ORGANICS			**SW8270C**		**(SW3520C)**		Analyst: **CO**
3,3'-Dichlorobenzidine	< 0.886		0.886	5.00	µg/L	1	11/13/2009 4:53:00 AM
3-Methylcholanthrene	< 0.647		0.647	5.00	µg/L	1	11/13/2009 4:53:00 AM
3-Nitroaniline	< 0.640		0.640	5.00	µg/L	1	11/13/2009 4:53:00 AM
4,6-Dinitro-2-methylphenol	< 0.863		0.863	50.0	µg/L	1	11/13/2009 4:53:00 AM
4-Aminobiphenyl	< 0.632		0.632	5.00	µg/L	1	11/13/2009 4:53:00 AM
4-Bromophenyl phenyl ether	< 0.651		0.651	5.00	µg/L	1	11/13/2009 4:53:00 AM
4-Chloro-3-methylphenol	< 0.596		0.596	5.00	µg/L	1	11/13/2009 4:53:00 AM
4-Chloroaniline	< 1.07		1.07	5.00	µg/L	1	11/13/2009 4:53:00 AM
4-Chlorophenyl phenyl ether	< 0.573		0.573	5.00	µg/L	1	11/13/2009 4:53:00 AM
4-Nitroaniline	< 1.52		1.52	15.0	µg/L	1	11/13/2009 4:53:00 AM
4-Nitrophenol	< 1.14		1.14	10.0	µg/L	1	11/13/2009 4:53:00 AM
7,12-Dimethylbenz(a)anthracene	< 0.648		0.648	5.00	µg/L	1	11/13/2009 4:53:00 AM
Acenaphthene	< 0.648		0.648	5.00	µg/L	1	11/13/2009 4:53:00 AM
Acenaphthylene	< 0.725		0.725	5.00	µg/L	1	11/13/2009 4:53:00 AM
Acetophenone	< 0.599		0.599	5.00	µg/L	1	11/13/2009 4:53:00 AM
Aniline	< 1.38		1.38	5.00	µg/L	1	11/13/2009 4:53:00 AM
Anthracene	< 0.926		0.926	5.00	µg/L	1	11/13/2009 4:53:00 AM
Atrazine	< 1.32	N	1.32	5.00	µg/L	1	11/13/2009 4:53:00 AM
Benzidine	< 2.71		2.71	5.00	µg/L	1	11/13/2009 4:53:00 AM
Benzo(a)anthracene	< 0.700		0.700	5.00	µg/L	1	11/13/2009 4:53:00 AM
Benzo(a)pyrene	< 0.801		0.801	5.00	µg/L	1	11/13/2009 4:53:00 AM
Benzo(b)fluoranthene	< 0.886		0.886	5.00	µg/L	1	11/13/2009 4:53:00 AM
Benzo(g,h,i)perylene	< 0.959		0.959	15.0	µg/L	1	11/13/2009 4:53:00 AM
Benzo(k)fluoranthene	< 0.988		0.988	5.00	µg/L	1	11/13/2009 4:53:00 AM
Benzoic acid	< 1.73		1.73	50.0	µg/L	1	11/13/2009 4:53:00 AM
Benzyl alcohol	< 0.594		0.594	10.0	µg/L	1	11/13/2009 4:53:00 AM
Bis(2-chloroethoxy)methane	< 0.775		0.775	5.00	µg/L	1	11/13/2009 4:53:00 AM
Bis(2-chloroethyl)ether	< 0.807		0.807	5.00	µg/L	1	11/13/2009 4:53:00 AM
Bis(2-chloroisopropyl)ether	< 0.652		0.652	5.00	µg/L	1	11/13/2009 4:53:00 AM
Bis(2-ethylhexyl)phthalate	< 0.619		0.619	5.00	µg/L	1	11/13/2009 4:53:00 AM
Butyl benzyl phthalate	< 0.670		0.670	5.00	µg/L	1	11/13/2009 4:53:00 AM
Carbaryl	< 0.567		0.567	5.00	µg/L	1	11/13/2009 4:53:00 AM
Carbazole	< 0.621		0.621	5.00	µg/L	1	11/13/2009 4:53:00 AM
Chrysene	< 0.884		0.884	5.00	µg/L	1	11/13/2009 4:53:00 AM
Cresols, Total	< 1.50	A	1.50	10.0	µg/L	1	11/13/2009 4:53:00 AM
Di-n-butyl phthalate	< 0.594		0.594	5.00	µg/L	1	11/13/2009 4:53:00 AM
Di-n-octyl phthalate	< 0.870		0.870	5.00	µg/L	1	11/13/2009 4:53:00 AM
Dibenz(a,j)acridine	< 0.769		0.769	10.0	µg/L	1	11/13/2009 4:53:00 AM
Dibenz(a,h)anthracene	< 0.567		0.567	10.0	µg/L	1	11/13/2009 4:53:00 AM
Dibenzofuran	< 0.673		0.673	5.00	µg/L	1	11/13/2009 4:53:00 AM

Qualifiers:

A Not Available for Accreditation
E Value Above Quantitation Range
N Not Accredited
X Value Exceeds Maximum Contaminant Level (MCL)
B Analyte Detected in Method Blank
H Holding Time Exceeded
S Spike Recovery Outside Recovery Limits

PQL: Practical Quantitation Limit

LCRA Environmental Laboratory Services

Date: *23-Nov-09*

CLIENT: COA WPDR
Lab Order: 0911234
Project: Emergency Investigations
Lab ID: 0911234-001

Client Sample ID: 759-Deep Eddy Well U/S
Collection Date: 11/9/2009 10:40:00 AM
Matrix: GROUNDWATER
Tag No:

Analyses	Result	Qual	MDL	PQL	Units	DF	Date Analyzed
SEMIVOLATILE ORGANICS			**SW8270C**		**(SW3520C)**		Analyst: **CO**
Diethyl phthalate	< 0.546		0.546	5.00	µg/L	1	11/13/2009 4:53:00 AM
Dimethyl phthalate	< 0.439		0.439	5.00	µg/L	1	11/13/2009 4:53:00 AM
Ethyl methanesulfonate	< 0.628		0.628	5.00	µg/L	1	11/13/2009 4:53:00 AM
Fluoranthene	< 0.719		0.719	5.00	µg/L	1	11/13/2009 4:53:00 AM
Fluorene	< 0.660		0.660	5.00	µg/L	1	11/13/2009 4:53:00 AM
Hexachlorobenzene	< 0.547		0.547	5.00	µg/L	1	11/13/2009 4:53:00 AM
Hexachlorobutadiene	< 0.640		0.640	5.00	µg/L	1	11/13/2009 4:53:00 AM
Hexachlorocyclopentadiene	< 0.628		0.628	10.0	µg/L	1	11/13/2009 4:53:00 AM
Hexachloroethane	< 0.610		0.610	5.00	µg/L	1	11/13/2009 4:53:00 AM
Indeno(1,2,3-cd)pyrene	< 0.760		0.760	10.0	µg/L	1	11/13/2009 4:53:00 AM
Isophorone	< 0.501		0.501	5.00	µg/L	1	11/13/2009 4:53:00 AM
m,p-cresol	< 0.924	A	0.924	10.0	µg/L	1	11/13/2009 4:53:00 AM
Methyl methanesulfonate	< 0.512		0.512	5.00	µg/L	1	11/13/2009 4:53:00 AM
N-Nitroso-di-n-butylamine	< 0.899		0.899	5.00	µg/L	1	11/13/2009 4:53:00 AM
N-Nitrosodi-n-propylamine	< 0.653		0.653	5.00	µg/L	1	11/13/2009 4:53:00 AM
N-Nitrosodiethylamine	< 0.665		0.665	20.0	µg/L	1	11/13/2009 4:53:00 AM
N-Nitrosodimethylamine	< 0.865		0.865	5.00	µg/L	1	11/13/2009 4:53:00 AM
N-Nitrosodiphenylamine	< 0.632		0.632	5.00	µg/L	1	11/13/2009 4:53:00 AM
N-Nitrosopiperidine	< 0.589		0.589	5.00	µg/L	1	11/13/2009 4:53:00 AM
Naphthalene	< 0.654		0.654	5.00	µg/L	1	11/13/2009 4:53:00 AM
Nitrobenzene	< 0.635		0.635	5.00	µg/L	1	11/13/2009 4:53:00 AM
p-Dimethylaminoazobenzene	< 0.546	A	0.546	10.0	µg/L	1	11/13/2009 4:53:00 AM
Pentachlorobenzene	< 0.413		0.413	5.00	µg/L	1	11/13/2009 4:53:00 AM
Pentachloronitrobenzene	< 0.840		0.840	5.00	µg/L	1	11/13/2009 4:53:00 AM
Pentachlorophenol	< 0.731		0.731	6.00	µg/L	1	11/13/2009 4:53:00 AM
Phenacetin	< 0.458		0.458	5.00	µg/L	1	11/13/2009 4:53:00 AM
Phenanthrene	< 0.636		0.636	5.00	µg/L	1	11/13/2009 4:53:00 AM
Phenol	< 0.709		0.709	8.00	µg/L	1	11/13/2009 4:53:00 AM
Pronamide	< 0.644		0.644	5.00	µg/L	1	11/13/2009 4:53:00 AM
Pyrene	< 0.686		0.686	10.0	µg/L	1	11/13/2009 4:53:00 AM
Pyridine	< 0.871		0.871	5.00	µg/L	1	11/13/2009 4:53:00 AM
Surr: 2,4,6-Tribromophenol	60.0		0	30-124	%REC	1	11/13/2009 4:53:00 AM
Surr: 2-Fluorobiphenyl	46.1		0	42-143	%REC	1	11/13/2009 4:53:00 AM
Surr: 2-Fluorophenol	36.9		0	17-121	%REC	1	11/13/2009 4:53:00 AM
Surr: 4-Terphenyl-d14	55.0		0	23-150	%REC	1	11/13/2009 4:53:00 AM
Surr: Nitrobenzene-d5	52.4		0	28-116	%REC	1	11/13/2009 4:53:00 AM
Surr: Phenol-d5	46.4		0	27-112	%REC	1	11/13/2009 4:53:00 AM
VOLATILES BY GC/MS			**SW8260B**				Analyst: **SG**
1,1,1-Trichloroethane	< 0.13		0.13	0.50	µg/L	1	11/11/2009 4:13:00 PM

Qualifiers:

A Not Available for Accreditation
E Value Above Quantitation Range
N Not Accredited
X Value Exceeds Maximum Contaminant Level (MCL)
B Analyte Detected in Method Blank
H Holding Time Exceeded
S Spike Recovery Outside Recovery Limits

PQL: Practical Quantitation Limit

LCRA Environmental Laboratory Services

Date: *23-Nov-09*

CLIENT: COA WPDR
Lab Order: 0911234
Project: Emergency Investigations
Lab ID: 0911234-001

Client Sample ID: 759-Deep Eddy Well U/S
Collection Date: 11/9/2009 10:40:00 AM
Matrix: GROUNDWATER
Tag No:

Analyses	Result	Qual	MDL	PQL	Units	DF	Date Analyzed
VOLATILES BY GC/MS			**SW8260B**				Analyst: **SG**
1,1,2,2-Tetrachloroethane	< 0.06		0.06	1.00	µg/L	1	11/11/2009 4:13:00 PM
1,1,2-Trichloroethane	< 0.10		0.10	0.50	µg/L	1	11/11/2009 4:13:00 PM
1,1-Dichloroethane	< 0.16		0.16	0.50	µg/L	1	11/11/2009 4:13:00 PM
1,1-Dichloroethene	< 0.12		0.12	0.50	µg/L	1	11/11/2009 4:13:00 PM
1,2,3-Trichlorobenzene	< 0.09		0.09	0.50	µg/L	1	11/11/2009 4:13:00 PM
1,2,3-Trichloropropane	< 0.11		0.11	1.00	µg/L	1	11/11/2009 4:13:00 PM
1,2,4-Trichlorobenzene	< 0.08		0.08	0.50	µg/L	1	11/11/2009 4:13:00 PM
1,2-Dibromo-3-chloropropane	< 0.15		0.15	1.00	µg/L	1	11/11/2009 4:13:00 PM
1,2-Dibromoethane	< 0.09		0.09	1.00	µg/L	1	11/11/2009 4:13:00 PM
1,2-Dichlorobenzene	< 0.08		0.08	0.50	µg/L	1	11/11/2009 4:13:00 PM
1,2-Dichloroethane	< 0.15		0.15	0.50	µg/L	1	11/11/2009 4:13:00 PM
1,2-Dichloroethene, Total	< 0.21	A	0.21	0.50	µg/L	1	11/11/2009 4:13:00 PM
1,2-Dichloropropane	< 0.15		0.15	0.50	µg/L	1	11/11/2009 4:13:00 PM
1,3-Dichlorobenzene	< 0.07		0.07	0.50	µg/L	1	11/11/2009 4:13:00 PM
1,4-Dichlorobenzene	< 0.06		0.06	0.50	µg/L	1	11/11/2009 4:13:00 PM
2-Butanone	< 0.36		0.36	5.00	µg/L	1	11/11/2009 4:13:00 PM
2-Chloroethyl vinyl ether	< 0.12		0.12	0.50	µg/L	1	11/11/2009 4:13:00 PM
2-Hexanone	< 0.08		0.08	5.00	µg/L	1	11/11/2009 4:13:00 PM
4-Methyl-2-pentanone	< 0.13		0.13	5.00	µg/L	1	11/11/2009 4:13:00 PM
Acetone	< 0.43		0.43	5.00	µg/L	1	11/11/2009 4:13:00 PM
Acrolein	< 2.83		2.83	10.0	µg/L	1	11/11/2009 4:13:00 PM
Acrylonitrile	< 0.24		0.24	5.00	µg/L	1	11/11/2009 4:13:00 PM
Benzene	< 0.10		0.10	0.50	µg/L	1	11/11/2009 4:13:00 PM
Bromodichloromethane	< 0.13		0.13	0.50	µg/L	1	11/11/2009 4:13:00 PM
Bromoform	< 0.08		0.08	0.50	µg/L	1	11/11/2009 4:13:00 PM
Bromomethane	< 0.41		0.41	1.50	µg/L	1	11/11/2009 4:13:00 PM
Carbon Disulfide	< 0.15		0.15	0.50	µg/L	1	11/11/2009 4:13:00 PM
Carbon Tetrachloride	< 0.14		0.14	0.50	µg/L	1	11/11/2009 4:13:00 PM
Chlorobenzene	< 0.09		0.09	0.50	µg/L	1	11/11/2009 4:13:00 PM
Chloroethane	< 0.17		0.17	1.00	µg/L	1	11/11/2009 4:13:00 PM
Chloroform	0.15	J	0.12	0.50	µg/L	1	11/11/2009 4:13:00 PM
Chloromethane	0.29	J	0.13	0.50	µg/L	1	11/11/2009 4:13:00 PM
cis-1,2-Dichloroethene	< 0.09		0.09	0.50	µg/L	1	11/11/2009 4:13:00 PM
cis-1,3-Dichloropropene	< 0.10		0.10	0.50	µg/L	1	11/11/2009 4:13:00 PM
Dibromochloromethane	< 0.10		0.10	0.50	µg/L	1	11/11/2009 4:13:00 PM
Dibromomethane	< 0.11		0.11	0.50	µg/L	1	11/11/2009 4:13:00 PM
Dichlorodifluoromethane	< 0.17		0.17	1.00	µg/L	1	11/11/2009 4:13:00 PM
Ethyl Methacrylate	< 0.06		0.06	1.00	µg/L	1	11/11/2009 4:13:00 PM
Ethylbenzene	< 0.10		0.10	0.50	µg/L	1	11/11/2009 4:13:00 PM
Iodomethane	< 0.12		0.12	0.50	µg/L	1	11/11/2009 4:13:00 PM

Qualifiers:

A Not Available for Accreditation
E Value Above Quantitation Range
N Not Accredited
X Value Exceeds Maximum Contaminant Level (MCL)
B Analyte Detected in Method Blank
H Holding Time Exceeded
S Spike Recovery Outside Recovery Limits

PQL: Practical Quantitation Limit

LCRA Environmental Laboratory Services

Date: *23-Nov-09*

CLIENT:	COA WPDR	**Client Sample ID:**	759-Deep Eddy Well U/S
Lab Order:	0911234	**Collection Date:**	11/9/2009 10:40:00 AM
Project:	Emergency Investigations	**Matrix:**	GROUNDWATER
Lab ID:	0911234-001	**Tag No:**	

Analyses	Result	Qual	MDL	PQL	Units	DF	Date Analyzed
VOLATILES BY GC/MS			**SW8260B**				Analyst: **SG**
m,p-Xylene	< 0.23		0.23	1.00	µg/L	1	11/11/2009 4:13:00 PM
Methyl tert-butyl ether	< 0.16		0.16	0.50	µg/L	1	11/11/2009 4:13:00 PM
Methylene chloride	< 0.10		0.10	0.50	µg/L	1	11/11/2009 4:13:00 PM
Naphthalene	< 0.06		0.06	0.50	µg/L	1	11/11/2009 4:13:00 PM
o-Xylene	< 0.09		0.09	0.50	µg/L	1	11/11/2009 4:13:00 PM
Styrene	< 0.10		0.10	0.50	µg/L	1	11/11/2009 4:13:00 PM
Tetrachloroethene	0.16	J	0.12	0.50	µg/L	1	11/11/2009 4:13:00 PM
Toluene	< 0.09		0.09	0.50	µg/L	1	11/11/2009 4:13:00 PM
trans-1,2-Dichloroethene	< 0.12		0.12	0.50	µg/L	1	11/11/2009 4:13:00 PM
trans-1,3-Dichloropropene	< 0.09		0.09	0.50	µg/L	1	11/11/2009 4:13:00 PM
trans-1,4-Dichloro-2-butene	< 0.11		0.11	0.50	µg/L	1	11/11/2009 4:13:00 PM
Trichloroethene	< 0.13		0.13	0.50	µg/L	1	11/11/2009 4:13:00 PM
Trichlorofluoromethane	< 0.17		0.17	0.50	µg/L	1	11/11/2009 4:13:00 PM
Vinyl Acetate	< 0.11		0.11	0.50	µg/L	1	11/11/2009 4:13:00 PM
Vinyl chloride	< 0.24		0.24	1.00	µg/L	1	11/11/2009 4:13:00 PM
Xylenes, Total	< 0.21		0.21	0.50	µg/L	1	11/11/2009 4:13:00 PM
Surr: 1,2-Dichloroethane-d4	94.8		0	70-130	%REC	1	11/11/2009 4:13:00 PM
Surr: 4-Bromofluorobenzene	105		0	70-130	%REC	1	11/11/2009 4:13:00 PM
Surr: Toluene-d8	106		0	70-130	%REC	1	11/11/2009 4:13:00 PM
OIL AND GREASE, HEM			**E1664**				Analyst: **MH**
Oil & Grease, Total Recoverable	0.51	J	0.40	2.53	mg/L	1	11/13/2009
ANIONS BY ION CHROMATOGRAPHY			**E300.0**				Analyst: **WR**
Chloride	45.1		0.017	1.00	mg/L	1	11/9/2009 6:21:00 PM
Fluoride	0.304		0.002	0.010	mg/L	1	11/9/2009 6:21:00 PM
Phosphorus, Orthophosphate (As P)	0.028		0.002	0.010	mg/L	1	11/9/2009 6:21:00 PM
Sulfate	46.2		0.015	1.00	mg/L	1	11/9/2009 6:21:00 PM
ALKALINITY			**SM2320 B**				Analyst: **JB**
Alkalinity, Total (As CaCO3)	314		0.1	2	mg/L CaCO3	1	11/11/2009
CHLOROPHYLL AND PHEOPHYTIN			**E445.0**				Analyst: **ZP**
Chlorophyll A	< 0.04		0.04	0.5	µg/L	1	11/11/2009
Pheophytin A	< 0.04		0.04	0.5	µg/L	1	11/11/2009
NITRATE AND NITRITE			**SM4500-NO3-H**				Analyst: **KK**
Nitrogen, Nitrate & Nitrite	1.81		0.004	0.020	mg/L	1	11/16/2009
AMMONIA AS N			**E350.1**				Analyst: **ML**
Nitrogen, Ammonia (As N)	< 0.005		0.005	0.020	mg/L	1	11/16/2009
ORGANIC CARBON, TOTAL			**SM5310D**				Analyst: **CM**

Qualifiers:

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B Analyte Detected in Method Blank
H Holding Time Exceeded
S Spike Recovery Outside Recovery Limits

PQL: Practical Quantitation Limit

LCRA Environmental Laboratory Services

Date: *23-Nov-09*

CLIENT:	COA WPDR	**Client Sample ID:**	759-Deep Eddy Well U/S
Lab Order:	0911234	**Collection Date:**	11/9/2009 10:40:00 AM
Project:	Emergency Investigations	**Matrix:**	GROUNDWATER
Lab ID:	0911234-001	**Tag No:**	

Analyses	Result	Qual	MDL	PQL	Units	DF	Date Analyzed
ORGANIC CARBON, TOTAL			**SM5310D**				Analyst: **CM**
Organic Carbon, Total	0.946		0.025	0.500	mg/L	1	11/12/2009
TOTAL SUSPENDED SOLIDS			**SM2540D**				Analyst: **JB**
Suspended Solids (Residue, Non-Filterable)	1.0		0.5	1.0	mg/L	1	11/10/2009
VOLATILE SUSPENDED SOLIDS			**E160.4**				Analyst: **JB**
Volatile Suspended Solids	0.500	J	0.500	1.00	mg/L	1	11/10/2009

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LCRA Environmental Laboratory Services

Date: *23-Nov-09*

CLIENT:	COA WPDR	**Client Sample ID:**	4522-Deep Eddy Well D/S
Lab Order:	0911234	**Collection Date:**	11/9/2009 9:30:00 AM
Project:	Emergency Investigations	**Matrix:**	GROUNDWATER
Lab ID:	0911234-002	**Tag No:**	

Analyses	Result	Qual	MDL	PQL	Units	DF	Date Analyzed
ORGANOPHOSPHORUS PESTICIDES			**SW8141A**		**(SW3520C)**		Analyst: **BC**
Ethyl Parathion	< 0.11		0.11	0.50	µg/L	1	11/12/2009 6:51:01 PM
Methyl parathion	< 0.13		0.13	0.50	µg/L	1	11/12/2009 6:51:01 PM
Azinphosmethyl	< 0.11		0.11	0.50	µg/L	1	11/12/2009 6:51:01 PM
Chloropyrifos	< 0.09		0.09	0.50	µg/L	1	11/12/2009 6:51:01 PM
Demeton, Total	< 0.17		0.17	0.50	µg/L	1	11/12/2009 6:51:01 PM
Demeton-O	< 0.15		0.15	0.50	µg/L	1	11/12/2009 6:51:01 PM
Demeton-S	< 0.13		0.13	0.50	µg/L	1	11/12/2009 6:51:01 PM
Diazinon	< 0.10		0.10	0.50	µg/L	1	11/12/2009 6:51:01 PM
Malathion	< 0.09		0.09	0.50	µg/L	1	11/12/2009 6:51:01 PM
Surr: Phorate	93.8		0	70-130	%REC	1	11/12/2009 6:51:01 PM
Surr: Triphenyl Phosphate	110		0	70-130	%REC	1	11/12/2009 6:51:01 PM
CHLORINATED HERBICIDES			**SW8151A**		**(SW8151A)**		Analyst: **CO**
2,4,5-T	< 0.17		0.17	0.51	µg/L	1	11/18/2009 1:48:40 PM
2,4,5-TP (Silvex)	< 0.19		0.19	0.51	µg/L	1	11/18/2009 1:48:40 PM
2,4-D	< 0.13		0.13	0.51	µg/L	1	11/18/2009 1:48:40 PM
Dalapon	< 0.17		0.17	0.51	µg/L	1	11/18/2009 1:48:40 PM
Dicamba	< 0.16		0.16	0.51	µg/L	1	11/18/2009 1:48:40 PM
Dinoseb	< 0.21		0.21	0.51	µg/L	1	11/18/2009 1:48:40 PM
Pentachlorophenol	< 0.15		0.15	0.51	µg/L	1	11/18/2009 1:48:40 PM
Picloram	< 0.11		0.11	0.51	µg/L	1	11/18/2009 1:48:40 PM
Surr: 2,4-DB	93.4		0.07	70-130	%REC	1	11/18/2009 1:48:40 PM
TNRCC METHOD 1005-TPH			**TX1005**		**(TX1005)**		Analyst: **SM**
>C12-C28	< 0.5	A	0.5	4.5	mg/L	1	11/19/2009 6:15:51 PM
>C28-C35	0.7	JA	0.1	4.5	mg/L	1	11/19/2009 6:15:51 PM
C6-C12	0.6	JA	0.5	4.5	mg/L	1	11/19/2009 6:15:51 PM
C6-C35	< 0.6		0.6	4.5	mg/L	1	11/19/2009 6:15:51 PM
Surr: a,a,a-Trifluorotoluene	98.0		0	70-130	%REC	1	11/19/2009 6:15:51 PM
Surr: o-Terphenyl	79.5		0	70-130	%REC	1	11/19/2009 6:15:51 PM
ICP METALS, TOTAL RECOVERABLE			**E200.7**				Analyst: **MV**
Calcium	70.7		0.0260	0.200	mg/L	1	11/16/2009 12:50:34 PM
Iron	0.134		0.00290	0.0500	mg/L	1	11/16/2009 12:50:34 PM
Magnesium	23.6		0.0117	0.200	mg/L	1	11/16/2009 12:50:34 PM
Potassium	3.98		0.0537	0.200	mg/L	1	11/16/2009 12:50:34 PM
Sodium	29.0		0.0200	0.600	mg/L	1	11/16/2009 12:50:34 PM
ICPMS METALS, TOTAL RECOVERABLE			**E200.8**				Analyst: **SW**
Arsenic	2.29		0.643	2.00	µg/L	1	11/12/2009 11:32:09 AM
Copper	0.414	J	0.086	2.00	µg/L	1	11/12/2009 11:32:09 AM
Lead	< 0.087		0.087	1.00	µg/L	1	11/12/2009 11:32:09 AM

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LCRA Environmental Laboratory Services

Date: *23-Nov-09*

CLIENT:	COA WPDR	**Client Sample ID:**	4522-Deep Eddy Well D/S
Lab Order:	0911234	**Collection Date:**	11/9/2009 9:30:00 AM
Project:	Emergency Investigations	**Matrix:**	GROUNDWATER
Lab ID:	0911234-002	**Tag No:**	

Analyses	Result	Qual	MDL	PQL	Units	DF	Date Analyzed
ICPMS METALS, TOTAL RECOVERABLE			**E200.8**				Analyst: **SW**
Nickel	2.69		0.122	2.00	µg/L	1	11/12/2009 11:32:09 AM
Strontium	556		0.430	10.0	µg/L	10	11/12/2009 12:35:32 PM
Zinc	< 1.29		1.29	5.00	µg/L	1	11/12/2009 11:32:09 AM
HARDNESS, TOTAL			**SM2340 B**				Analyst: **MV**
Hardness, Calcium/Magnesium (As CaCO3)	274		0.065	1.32	mg/L	1	11/16/2009
ORGANIC COMPOUNDS			**E525.2**		**(E525.2)**		Analyst: **SG**
Bromacil	< 0.0411	A	0.0411	0.209	µg/L	1	11/12/2009 6:37:00 PM
Surr: 1,3-Dimethyl-2-nitrobenzene	94.4		0	70-130	%REC	1	11/12/2009 6:37:00 PM
Surr: Perylene-d12	77.6		0	70-130	%REC	1	11/12/2009 6:37:00 PM
Surr: Pyrene-d10	101		0	70-130	%REC	1	11/12/2009 6:37:00 PM
Surr: Triphenyl Phosphate	103		0	70-130	%REC	1	11/12/2009 6:37:00 PM
SEMIVOLATILE ORGANICS			**SW8270C**		**(SW3520C)**		Analyst: **CO**
1&2-Chloronaphthalene	< 1.27	A	1.27	10.0	µg/L	1	11/13/2009 5:28:00 AM
1,2,4,5-Tetrachlorobenzene	< 0.617		0.617	10.0	µg/L	1	11/13/2009 5:28:00 AM
1,2,4-Trichlorobenzene	< 0.585		0.585	5.00	µg/L	1	11/13/2009 5:28:00 AM
1,2-Dichlorobenzene	< 0.711		0.711	5.00	µg/L	1	11/13/2009 5:28:00 AM
1,2-Diphenylhydrazine	< 0.553		0.553	5.00	µg/L	1	11/13/2009 5:28:00 AM
1,3-Dichlorobenzene	< 0.764		0.764	5.00	µg/L	1	11/13/2009 5:28:00 AM
1,4-Dichlorobenzene	< 0.871		0.871	5.00	µg/L	1	11/13/2009 5:28:00 AM
1-Naphthylamine	< 0.932	A	0.932	10.0	µg/L	1	11/13/2009 5:28:00 AM
2,3,4,6-Tetrachlorophenol	< 1.19		1.19	10.0	µg/L	1	11/13/2009 5:28:00 AM
2,4,5-Trichlorophenol	< 0.861		0.861	6.00	µg/L	1	11/13/2009 5:28:00 AM
2,4,6-Trichlorophenol	< 0.614		0.614	5.00	µg/L	1	11/13/2009 5:28:00 AM
2,4-Dichlorophenol	< 0.768		0.768	5.00	µg/L	1	11/13/2009 5:28:00 AM
2,4-Dimethylphenol	< 0.785		0.785	5.00	µg/L	1	11/13/2009 5:28:00 AM
2,4-Dinitrophenol	< 1.12		1.12	50.0	µg/L	1	11/13/2009 5:28:00 AM
2,4-Dinitrotoluene	< 0.627		0.627	10.0	µg/L	1	11/13/2009 5:28:00 AM
2,6-Dichlorophenol	< 0.492		0.492	5.00	µg/L	1	11/13/2009 5:28:00 AM
2,6-Dinitrotoluene	< 0.712		0.712	5.00	µg/L	1	11/13/2009 5:28:00 AM
2-Chlorophenol	< 0.606		0.606	5.00	µg/L	1	11/13/2009 5:28:00 AM
2-Methylnaphthalene	< 0.542		0.542	5.00	µg/L	1	11/13/2009 5:28:00 AM
2-Methylphenol	< 0.633		0.633	5.00	µg/L	1	11/13/2009 5:28:00 AM
2-Naphthylamine	< 0.562		0.562	5.00	µg/L	1	11/13/2009 5:28:00 AM
2-Nitroaniline	< 0.929		0.929	5.00	µg/L	1	11/13/2009 5:28:00 AM
2-Nitrophenol	< 0.534		0.534	5.00	µg/L	1	11/13/2009 5:28:00 AM
2-Picoline	< 0.766		0.766	5.00	µg/L	1	11/13/2009 5:28:00 AM
3,3´-Dichlorobenzidine	< 0.886		0.886	5.00	µg/L	1	11/13/2009 5:28:00 AM
3-Methylcholanthrene	< 0.647		0.647	5.00	µg/L	1	11/13/2009 5:28:00 AM

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LCRA Environmental Laboratory Services

Date: *23-Nov-09*

CLIENT: COA WPDR
Lab Order: 0911234
Project: Emergency Investigations
Lab ID: 0911234-002

Client Sample ID: 4522-Deep Eddy Well D/S
Collection Date: 11/9/2009 9:30:00 AM
Matrix: GROUNDWATER
Tag No:

Analyses	Result	Qual	MDL	PQL	Units	DF	Date Analyzed
SEMIVOLATILE ORGANICS			**SW8270C**		**(SW3520C)**		Analyst: **CO**
3-Nitroaniline	< 0.640		0.640	5.00	µg/L	1	11/13/2009 5:28:00 AM
4,6-Dinitro-2-methylphenol	< 0.863		0.863	50.0	µg/L	1	11/13/2009 5:28:00 AM
4-Aminobiphenyl	< 0.632		0.632	5.00	µg/L	1	11/13/2009 5:28:00 AM
4-Bromophenyl phenyl ether	< 0.651		0.651	5.00	µg/L	1	11/13/2009 5:28:00 AM
4-Chloro-3-methylphenol	< 0.596		0.596	5.00	µg/L	1	11/13/2009 5:28:00 AM
4-Chloroaniline	< 1.07		1.07	5.00	µg/L	1	11/13/2009 5:28:00 AM
4-Chlorophenyl phenyl ether	< 0.573		0.573	5.00	µg/L	1	11/13/2009 5:28:00 AM
4-Nitroaniline	< 1.52		1.52	15.0	µg/L	1	11/13/2009 5:28:00 AM
4-Nitrophenol	< 1.14		1.14	10.0	µg/L	1	11/13/2009 5:28:00 AM
7,12-Dimethylbenz(a)anthracene	< 0.648		0.648	5.00	µg/L	1	11/13/2009 5:28:00 AM
Acenaphthene	< 0.648		0.648	5.00	µg/L	1	11/13/2009 5:28:00 AM
Acenaphthylene	< 0.725		0.725	5.00	µg/L	1	11/13/2009 5:28:00 AM
Acetophenone	< 0.599		0.599	5.00	µg/L	1	11/13/2009 5:28:00 AM
Aniline	< 1.38		1.38	5.00	µg/L	1	11/13/2009 5:28:00 AM
Anthracene	< 0.926		0.926	5.00	µg/L	1	11/13/2009 5:28:00 AM
Atrazine	< 1.32	N	1.32	5.00	µg/L	1	11/13/2009 5:28:00 AM
Benzidine	< 2.71		2.71	5.00	µg/L	1	11/13/2009 5:28:00 AM
Benzo(a)anthracene	< 0.700		0.700	5.00	µg/L	1	11/13/2009 5:28:00 AM
Benzo(a)pyrene	< 0.801		0.801	5.00	µg/L	1	11/13/2009 5:28:00 AM
Benzo(b)fluoranthene	< 0.886		0.886	5.00	µg/L	1	11/13/2009 5:28:00 AM
Benzo(g,h,i)perylene	< 0.959		0.959	15.0	µg/L	1	11/13/2009 5:28:00 AM
Benzo(k)fluoranthene	< 0.988		0.988	5.00	µg/L	1	11/13/2009 5:28:00 AM
Benzoic acid	< 1.73		1.73	50.0	µg/L	1	11/13/2009 5:28:00 AM
Benzyl alcohol	< 0.594		0.594	10.0	µg/L	1	11/13/2009 5:28:00 AM
Bis(2-chloroethoxy)methane	< 0.775		0.775	5.00	µg/L	1	11/13/2009 5:28:00 AM
Bis(2-chloroethyl)ether	< 0.807		0.807	5.00	µg/L	1	11/13/2009 5:28:00 AM
Bis(2-chloroisopropyl)ether	< 0.652		0.652	5.00	µg/L	1	11/13/2009 5:28:00 AM
Bis(2-ethylhexyl)phthalate	12.8		0.619	5.00	µg/L	1	11/13/2009 5:28:00 AM
Butyl benzyl phthalate	< 0.670		0.670	5.00	µg/L	1	11/13/2009 5:28:00 AM
Carbaryl	< 0.567		0.567	5.00	µg/L	1	11/13/2009 5:28:00 AM
Carbazole	< 0.621		0.621	5.00	µg/L	1	11/13/2009 5:28:00 AM
Chrysene	< 0.884		0.884	5.00	µg/L	1	11/13/2009 5:28:00 AM
Cresols, Total	< 1.50	A	1.50	10.0	µg/L	1	11/13/2009 5:28:00 AM
Di-n-butyl phthalate	< 0.594		0.594	5.00	µg/L	1	11/13/2009 5:28:00 AM
Di-n-octyl phthalate	< 0.870		0.870	5.00	µg/L	1	11/13/2009 5:28:00 AM
Dibenz(a,j)acridine	< 0.769		0.769	10.0	µg/L	1	11/13/2009 5:28:00 AM
Dibenz(a,h)anthracene	< 0.567		0.567	10.0	µg/L	1	11/13/2009 5:28:00 AM
Dibenzofuran	< 0.673		0.673	5.00	µg/L	1	11/13/2009 5:28:00 AM
Diethyl phthalate	< 0.546		0.546	5.00	µg/L	1	11/13/2009 5:28:00 AM
Dimethyl phthalate	< 0.439		0.439	5.00	µg/L	1	11/13/2009 5:28:00 AM

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LCRA Environmental Laboratory Services

Date: *23-Nov-09*

CLIENT:	COA WPDR	**Client Sample ID:**	4522-Deep Eddy Well D/S
Lab Order:	0911234	**Collection Date:**	11/9/2009 9:30:00 AM
Project:	Emergency Investigations	**Matrix:**	GROUNDWATER
Lab ID:	0911234-002	**Tag No:**	

Analyses	Result	Qual	MDL	PQL	Units	DF	Date Analyzed
SEMIVOLATILE ORGANICS			**SW8270C**		**(SW3520C)**		Analyst: **CO**
Ethyl methanesulfonate	< 0.628		0.628	5.00	µg/L	1	11/13/2009 5:28:00 AM
Fluoranthene	< 0.719		0.719	5.00	µg/L	1	11/13/2009 5:28:00 AM
Fluorene	< 0.660		0.660	5.00	µg/L	1	11/13/2009 5:28:00 AM
Hexachlorobenzene	< 0.547		0.547	5.00	µg/L	1	11/13/2009 5:28:00 AM
Hexachlorobutadiene	< 0.640		0.640	5.00	µg/L	1	11/13/2009 5:28:00 AM
Hexachlorocyclopentadiene	< 0.628		0.628	10.0	µg/L	1	11/13/2009 5:28:00 AM
Hexachloroethane	< 0.610		0.610	5.00	µg/L	1	11/13/2009 5:28:00 AM
Indeno(1,2,3-cd)pyrene	< 0.760		0.760	10.0	µg/L	1	11/13/2009 5:28:00 AM
Isophorone	< 0.501		0.501	5.00	µg/L	1	11/13/2009 5:28:00 AM
m,p-cresol	< 0.924	A	0.924	10.0	µg/L	1	11/13/2009 5:28:00 AM
Methyl methanesulfonate	< 0.512		0.512	5.00	µg/L	1	11/13/2009 5:28:00 AM
N-Nitroso-di-n-butylamine	< 0.899		0.899	5.00	µg/L	1	11/13/2009 5:28:00 AM
N-Nitrosodi-n-propylamine	< 0.653		0.653	5.00	µg/L	1	11/13/2009 5:28:00 AM
N-Nitrosodiethylamine	< 0.665		0.665	20.0	µg/L	1	11/13/2009 5:28:00 AM
N-Nitrosodimethylamine	< 0.865		0.865	5.00	µg/L	1	11/13/2009 5:28:00 AM
N-Nitrosodiphenylamine	< 0.632		0.632	5.00	µg/L	1	11/13/2009 5:28:00 AM
N-Nitrosopiperidine	< 0.589		0.589	5.00	µg/L	1	11/13/2009 5:28:00 AM
Naphthalene	< 0.654		0.654	5.00	µg/L	1	11/13/2009 5:28:00 AM
Nitrobenzene	< 0.635		0.635	5.00	µg/L	1	11/13/2009 5:28:00 AM
p-Dimethylaminoazobenzene	< 0.546	A	0.546	10.0	µg/L	1	11/13/2009 5:28:00 AM
Pentachlorobenzene	< 0.413		0.413	5.00	µg/L	1	11/13/2009 5:28:00 AM
Pentachloronitrobenzene	< 0.840		0.840	5.00	µg/L	1	11/13/2009 5:28:00 AM
Pentachlorophenol	< 0.731		0.731	6.00	µg/L	1	11/13/2009 5:28:00 AM
Phenacetin	< 0.458		0.458	5.00	µg/L	1	11/13/2009 5:28:00 AM
Phenanthrene	< 0.636		0.636	5.00	µg/L	1	11/13/2009 5:28:00 AM
Phenol	< 0.709		0.709	8.00	µg/L	1	11/13/2009 5:28:00 AM
Pronamide	< 0.644		0.644	5.00	µg/L	1	11/13/2009 5:28:00 AM
Pyrene	< 0.686		0.686	10.0	µg/L	1	11/13/2009 5:28:00 AM
Pyridine	< 0.871		0.871	5.00	µg/L	1	11/13/2009 5:28:00 AM
Surr: 2,4,6-Tribromophenol	56.7		0	30-124	%REC	1	11/13/2009 5:28:00 AM
Surr: 2-Fluorobiphenyl	46.8		0	42-143	%REC	1	11/13/2009 5:28:00 AM
Surr: 2-Fluorophenol	25.4		0	17-121	%REC	1	11/13/2009 5:28:00 AM
Surr: 4-Terphenyl-d14	66.2		0	23-150	%REC	1	11/13/2009 5:28:00 AM
Surr: Nitrobenzene-d5	54.0		0	28-116	%REC	1	11/13/2009 5:28:00 AM
Surr: Phenol-d5	39.3		0	27-112	%REC	1	11/13/2009 5:28:00 AM
VOLATILES BY GC/MS			**SW8260B**				Analyst: **SG**
1,1,1-Trichloroethane	< 0.13		0.13	0.50	µg/L	1	11/11/2009 5:51:00 PM
1,1,2,2-Tetrachloroethane	< 0.06		0.06	1.00	µg/L	1	11/11/2009 5:51:00 PM
1,1,2-Trichloroethane	< 0.10		0.10	0.50	µg/L	1	11/11/2009 5:51:00 PM

Qualifiers:

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B Analyte Detected in Method Blank
H Holding Time Exceeded
S Spike Recovery Outside Recovery Limits

PQL: Practical Quantitation Limit

LCRA Environmental Laboratory Services

Date: *23-Nov-09*

CLIENT:	COA WPDR	**Client Sample ID:**	4522-Deep Eddy Well D/S
Lab Order:	0911234	**Collection Date:**	11/9/2009 9:30:00 AM
Project:	Emergency Investigations	**Matrix:**	GROUNDWATER
Lab ID:	0911234-002	**Tag No:**	

Analyses	Result	Qual	MDL	PQL	Units	DF	Date Analyzed
VOLATILES BY GC/MS			**SW8260B**				Analyst: **SG**
1,1-Dichloroethane	< 0.16		0.16	0.50	µg/L	1	11/11/2009 5:51:00 PM
1,1-Dichloroethene	< 0.12		0.12	0.50	µg/L	1	11/11/2009 5:51:00 PM
1,2,3-Trichlorobenzene	< 0.09		0.09	0.50	µg/L	1	11/11/2009 5:51:00 PM
1,2,3-Trichloropropane	< 0.11		0.11	1.00	µg/L	1	11/11/2009 5:51:00 PM
1,2,4-Trichlorobenzene	< 0.08		0.08	0.50	µg/L	1	11/11/2009 5:51:00 PM
1,2-Dibromo-3-chloropropane	< 0.15		0.15	1.00	µg/L	1	11/11/2009 5:51:00 PM
1,2-Dibromoethane	< 0.09		0.09	1.00	µg/L	1	11/11/2009 5:51:00 PM
1,2-Dichlorobenzene	< 0.08		0.08	0.50	µg/L	1	11/11/2009 5:51:00 PM
1,2-Dichloroethane	< 0.15		0.15	0.50	µg/L	1	11/11/2009 5:51:00 PM
1,2-Dichloroethene, Total	< 0.21	A	0.21	0.50	µg/L	1	11/11/2009 5:51:00 PM
1,2-Dichloropropane	< 0.15		0.15	0.50	µg/L	1	11/11/2009 5:51:00 PM
1,3-Dichlorobenzene	< 0.07		0.07	0.50	µg/L	1	11/11/2009 5:51:00 PM
1,4-Dichlorobenzene	< 0.06		0.06	0.50	µg/L	1	11/11/2009 5:51:00 PM
2-Butanone	< 0.36		0.36	5.00	µg/L	1	11/11/2009 5:51:00 PM
2-Chloroethyl vinyl ether	< 0.12		0.12	0.50	µg/L	1	11/11/2009 5:51:00 PM
2-Hexanone	< 0.08		0.08	5.00	µg/L	1	11/11/2009 5:51:00 PM
4-Methyl-2-pentanone	< 0.13		0.13	5.00	µg/L	1	11/11/2009 5:51:00 PM
Acetone	< 0.43		0.43	5.00	µg/L	1	11/11/2009 5:51:00 PM
Acrolein	< 2.83		2.83	10.0	µg/L	1	11/11/2009 5:51:00 PM
Acrylonitrile	< 0.24		0.24	5.00	µg/L	1	11/11/2009 5:51:00 PM
Benzene	< 0.10		0.10	0.50	µg/L	1	11/11/2009 5:51:00 PM
Bromodichloromethane	< 0.13		0.13	0.50	µg/L	1	11/11/2009 5:51:00 PM
Bromoform	< 0.08		0.08	0.50	µg/L	1	11/11/2009 5:51:00 PM
Bromomethane	< 0.41		0.41	1.50	µg/L	1	11/11/2009 5:51:00 PM
Carbon Disulfide	< 0.15		0.15	0.50	µg/L	1	11/11/2009 5:51:00 PM
Carbon Tetrachloride	< 0.14		0.14	0.50	µg/L	1	11/11/2009 5:51:00 PM
Chlorobenzene	< 0.09		0.09	0.50	µg/L	1	11/11/2009 5:51:00 PM
Chloroethane	< 0.17		0.17	1.00	µg/L	1	11/11/2009 5:51:00 PM
Chloroform	0.22	J	0.12	0.50	µg/L	1	11/11/2009 5:51:00 PM
Chloromethane	0.21	J	0.13	0.50	µg/L	1	11/11/2009 5:51:00 PM
cis-1,2-Dichloroethene	< 0.09		0.09	0.50	µg/L	1	11/11/2009 5:51:00 PM
cis-1,3-Dichloropropene	< 0.10		0.10	0.50	µg/L	1	11/11/2009 5:51:00 PM
Dibromochloromethane	< 0.10		0.10	0.50	µg/L	1	11/11/2009 5:51:00 PM
Dibromomethane	< 0.11		0.11	0.50	µg/L	1	11/11/2009 5:51:00 PM
Dichlorodifluoromethane	< 0.17		0.17	1.00	µg/L	1	11/11/2009 5:51:00 PM
Ethyl Methacrylate	< 0.06		0.06	1.00	µg/L	1	11/11/2009 5:51:00 PM
Ethylbenzene	< 0.10		0.10	0.50	µg/L	1	11/11/2009 5:51:00 PM
Iodomethane	< 0.12		0.12	0.50	µg/L	1	11/11/2009 5:51:00 PM
m,p-Xylene	< 0.23		0.23	1.00	µg/L	1	11/11/2009 5:51:00 PM
Methyl tert-butyl ether	< 0.16		0.16	0.50	µg/L	1	11/11/2009 5:51:00 PM

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LCRA Environmental Laboratory Services

Date: *23-Nov-09*

CLIENT:	COA WPDR	**Client Sample ID:**	4522-Deep Eddy Well D/S
Lab Order:	0911234	**Collection Date:**	11/9/2009 9:30:00 AM
Project:	Emergency Investigations	**Matrix:**	GROUNDWATER
Lab ID:	0911234-002	**Tag No:**	

Analyses	Result	Qual	MDL	PQL	Units	DF	Date Analyzed
VOLATILES BY GC/MS			**SW8260B**				Analyst: **SG**
Methylene chloride	< 0.10		0.10	0.50	µg/L	1	11/11/2009 5:51:00 PM
Naphthalene	< 0.06		0.06	0.50	µg/L	1	11/11/2009 5:51:00 PM
o-Xylene	< 0.09		0.09	0.50	µg/L	1	11/11/2009 5:51:00 PM
Styrene	< 0.10		0.10	0.50	µg/L	1	11/11/2009 5:51:00 PM
Tetrachloroethene	< 0.12		0.12	0.50	µg/L	1	11/11/2009 5:51:00 PM
Toluene	< 0.09		0.09	0.50	µg/L	1	11/11/2009 5:51:00 PM
trans-1,2-Dichloroethene	< 0.12		0.12	0.50	µg/L	1	11/11/2009 5:51:00 PM
trans-1,3-Dichloropropene	< 0.09		0.09	0.50	µg/L	1	11/11/2009 5:51:00 PM
trans-1,4-Dichloro-2-butene	< 0.11		0.11	0.50	µg/L	1	11/11/2009 5:51:00 PM
Trichloroethene	< 0.13		0.13	0.50	µg/L	1	11/11/2009 5:51:00 PM
Trichlorofluoromethane	< 0.17		0.17	0.50	µg/L	1	11/11/2009 5:51:00 PM
Vinyl Acetate	< 0.11		0.11	0.50	µg/L	1	11/11/2009 5:51:00 PM
Vinyl chloride	< 0.24		0.24	1.00	µg/L	1	11/11/2009 5:51:00 PM
Xylenes, Total	< 0.21		0.21	0.50	µg/L	1	11/11/2009 5:51:00 PM
Surr: 1,2-Dichloroethane-d4	98.4		0	70-130	%REC	1	11/11/2009 5:51:00 PM
Surr: 4-Bromofluorobenzene	103		0	70-130	%REC	1	11/11/2009 5:51:00 PM
Surr: Toluene-d8	102		0	70-130	%REC	1	11/11/2009 5:51:00 PM
OIL AND GREASE, HEM			**E1664**				Analyst: **MH**
Oil & Grease, Total Recoverable	0.50	J	0.40	2.52	mg/L	1	11/13/2009
ANIONS BY ION CHROMATOGRAPHY			**E300.0**				Analyst: **WR**
Chloride	41.7		0.017	1.00	mg/L	1	11/9/2009 6:35:00 PM
Fluoride	0.251		0.002	0.010	mg/L	1	11/9/2009 6:35:00 PM
Phosphorus, Orthophosphate (As P)	0.040		0.002	0.010	mg/L	1	11/9/2009 6:35:00 PM
Sulfate	36.2		0.015	1.00	mg/L	1	11/9/2009 6:35:00 PM
ALKALINITY			**SM2320 B**				Analyst: **JB**
Alkalinity, Total (As CaCO3)	232		0.1	2	mg/L CaCO3	1	11/11/2009
CHLOROPHYLL AND PHEOPHYTIN			**E445.0**				Analyst: **ZP**
Chlorophyll A	< 0.04		0.04	0.5	µg/L	1	11/11/2009
Pheophytin A	< 0.04		0.04	0.5	µg/L	1	11/11/2009
NITRATE AND NITRITE			**SM4500-NO3-H**				Analyst: **KK**
Nitrogen, Nitrate & Nitrite	0.308		0.004	0.020	mg/L	1	11/16/2009
AMMONIA AS N			**E350.1**				Analyst: **ML**
Nitrogen, Ammonia (As N)	0.060		0.005	0.020	mg/L	1	11/16/2009
ORGANIC CARBON, TOTAL			**SM5310D**				Analyst: **CM**
Organic Carbon, Total	1.67		0.025	0.500	mg/L	1	11/12/2009

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LCRA Environmental Laboratory Services

Date: *23-Nov-09*

CLIENT:	COA WPDR	**Client Sample ID:**	4522-Deep Eddy Well D/S
Lab Order:	0911234	**Collection Date:**	11/9/2009 9:30:00 AM
Project:	Emergency Investigations	**Matrix:**	GROUNDWATER
Lab ID:	0911234-002	**Tag No:**	

Analyses	Result	Qual	MDL	PQL	Units	DF	Date Analyzed
TOTAL SUSPENDED SOLIDS			**SM2540D**				Analyst: **JB**
Suspended Solids (Residue, Non-Filterable)	< 1.0		1.0	2.0	mg/L	2	11/10/2009
VOLATILE SUSPENDED SOLIDS			**E160.4**				Analyst: **JB**
Volatile Suspended Solids	< 1.00		1.00	2.00	mg/L	2	11/10/2009

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LCRA Environmental Laboratory Services

Date: *23-Nov-09*

CLIENT:	COA WPDR	**Client Sample ID:**	4524-Deep Eddy Pool
Lab Order:	0911234	**Collection Date:**	11/9/2009 10:15:00 AM
Project:	Emergency Investigations	**Matrix:**	GROUNDWATER
Lab ID:	0911234-003	**Tag No:**	

Analyses	Result	Qual	MDL	PQL	Units	DF	Date Analyzed
CHLOROPHYLL AND PHEOPHYTIN			**E445.0**				Analyst: **ZP**
Chlorophyll A	< 0.04		0.04	0.5	µg/L	1	11/11/2009
Pheophytin A	< 0.04		0.04	0.5	µg/L	1	11/11/2009

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H Holding Time Exceeded
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LCRA Environmental Laboratory Services

Date: *23-Nov-09*

CLIENT:	COA WPDR	**Client Sample ID:**	10-Town Lake @ Deep Eddy
Lab Order:	0911234	**Collection Date:**	11/9/2009 10:25:00 AM
Project:	Emergency Investigations	**Matrix:**	GROUNDWATER
Lab ID:	0911234-004	**Tag No:**	

Analyses	Result	Qual	MDL	PQL	Units	DF	Date Analyzed
CHLOROPHYLL AND PHEOPHYTIN			**E445.0**				Analyst: **ZP**
Chlorophyll A	12.3	X	0.04	0.5	µg/L	1	11/11/2009
Pheophytin A	2.1	X	0.04	0.5	µg/L	1	11/11/2009

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CASE NARRATIVE

Reporting Comments:
On 11/12/09, a Preliminary Report was provided on samples 0911234-001 and 0911234-002 for the following parameters only: Volatiles (SW8260B), Anions (E300) and TSS (SM2540D).

Final Analysis Report

LCRA Environmental Laboratory Services

Date: *23-Nov-09*

CLIENT: COA WPDR
Lab Order: 0911254
Project: Emergency Investigations
Lab ID: 0911254-001

Client Sample ID: 759-Deep Eddy Well U/S
Collection Date: 11/10/2009 11:00:00 AM
Matrix: GROUNDWATER
Tag No:

Analyses	Result	Qual	MDL	PQL	Units	DF	Date Analyzed
ORGANOPHOSPHORUS PESTICIDES			**SW8141A**		**(SW3520C)**		Analyst: **BC**
Ethyl Parathion	< 0.11		0.11	0.50	µg/L	1	11/12/2009 7:28:42 PM
Methyl parathion	< 0.13		0.13	0.50	µg/L	1	11/12/2009 7:28:42 PM
Azinphosmethyl	< 0.11		0.11	0.50	µg/L	1	11/12/2009 7:28:42 PM
Chloropyrifos	< 0.09		0.09	0.50	µg/L	1	11/12/2009 7:28:42 PM
Demeton, Total	< 0.17		0.17	0.50	µg/L	1	11/12/2009 7:28:42 PM
Demeton-O	< 0.15		0.15	0.50	µg/L	1	11/12/2009 7:28:42 PM
Demeton-S	< 0.13		0.13	0.50	µg/L	1	11/12/2009 7:28:42 PM
Diazinon	< 0.10		0.10	0.50	µg/L	1	11/12/2009 7:28:42 PM
Malathion	< 0.09		0.09	0.50	µg/L	1	11/12/2009 7:28:42 PM
Surr: Phorate	96.6		0	70-130	%REC	1	11/12/2009 7:28:42 PM
Surr: Triphenyl Phosphate	110		0	70-130	%REC	1	11/12/2009 7:28:42 PM
CHLORINATED HERBICIDES			**SW8151A**		**(SW8151A)**		Analyst: **CO**
2,4,5-T	< 0.17		0.17	0.52	µg/L	1	11/18/2009 2:10:08 PM
2,4,5-TP (Silvex)	< 0.19		0.19	0.52	µg/L	1	11/18/2009 2:10:08 PM
2,4-D	< 0.13		0.13	0.52	µg/L	1	11/18/2009 2:10:08 PM
Dalapon	< 0.17		0.17	0.52	µg/L	1	11/18/2009 2:10:08 PM
Dicamba	< 0.16		0.16	0.52	µg/L	1	11/18/2009 2:10:08 PM
Dinoseb	< 0.21		0.21	0.52	µg/L	1	11/18/2009 2:10:08 PM
Pentachlorophenol	< 0.15		0.15	0.52	µg/L	1	11/18/2009 2:10:08 PM
Picloram	< 0.11		0.11	0.52	µg/L	1	11/18/2009 2:10:08 PM
Surr: 2,4-DB	96.9		0.07	70-130	%REC	1	11/18/2009 2:10:08 PM
TNRCC METHOD 1005-TPH			**TX1005**		**(TX1005)**		Analyst: **SM**
>C12-C28	< 0.5	A	0.5	4.5	mg/L	1	11/19/2009 6:56:27 PM
>C28-C35	0.6	JA	0.1	4.5	mg/L	1	11/19/2009 6:56:27 PM
C6-C12	0.7	JA	0.5	4.5	mg/L	1	11/19/2009 6:56:27 PM
C6-C35	< 0.6		0.6	4.5	mg/L	1	11/19/2009 6:56:27 PM
Surr: a,a,a-Trifluorotoluene	103		0	70-130	%REC	1	11/19/2009 6:56:27 PM
Surr: o-Terphenyl	82.7		0	70-130	%REC	1	11/19/2009 6:56:27 PM
ICP METALS, TOTAL RECOVERABLE			**E200.7**				Analyst: **MV**
Calcium	109		0.0260	0.200	mg/L	1	11/16/2009 1:06:08 PM
Iron	0.0845		0.00290	0.0500	mg/L	1	11/16/2009 1:06:08 PM
Magnesium	24.4		0.0117	0.200	mg/L	1	11/16/2009 1:06:08 PM
Potassium	3.24		0.0537	0.200	mg/L	1	11/16/2009 1:06:08 PM
Sodium	34.4		0.0200	0.600	mg/L	1	11/16/2009 1:06:08 PM
ICPMS METALS, TOTAL RECOVERABLE			**E200.8**				Analyst: **SW**
Arsenic	1.36	J	0.643	2.00	µg/L	1	11/12/2009 11:37:48 AM

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LCRA Environmental Laboratory Services

Date: *23-Nov-09*

CLIENT:	COA WPDR	**Client Sample ID:**	759-Deep Eddy Well U/S
Lab Order:	0911254	**Collection Date:**	11/10/2009 11:00:00 AM
Project:	Emergency Investigations	**Matrix:**	GROUNDWATER
Lab ID:	0911254-001	**Tag No:**	

Analyses	Result	Qual	MDL	PQL	Units	DF	Date Analyzed
ICPMS METALS, TOTAL RECOVERABLE			**E200.8**				Analyst: **SW**
Copper	0.927	J	0.086	2.00	µg/L	1	11/12/2009 11:37:48 AM
Lead	< 0.087		0.087	1.00	µg/L	1	11/12/2009 11:37:48 AM
Nickel	3.66		0.122	2.00	µg/L	1	11/12/2009 11:37:48 AM
Strontium	796		0.430	10.0	µg/L	10	11/12/2009 12:41:12 PM
Zinc	4.60	J	1.29	5.00	µg/L	1	11/12/2009 11:37:48 AM
HARDNESS, TOTAL			**SM2340 B**				Analyst: **MV**
Hardness, Calcium/Magnesium (As CaCO3)	371		0.065	1.32	mg/L	1	11/16/2009
ORGANIC COMPOUNDS			**E525.2**		**(E525.2)**		Analyst: **SG**
Bromacil	< 0.0421	A	0.0421	0.214	µg/L	1	11/12/2009 8:01:00 PM
Surr: 1,3-Dimethyl-2-nitrobenzene	93.0		0	70-130	%REC	1	11/12/2009 8:01:00 PM
Surr: Perylene-d12	81.4		0	70-130	%REC	1	11/12/2009 8:01:00 PM
Surr: Pyrene-d10	101		0	70-130	%REC	1	11/12/2009 8:01:00 PM
Surr: Triphenyl Phosphate	108		0	70-130	%REC	1	11/12/2009 8:01:00 PM
SEMIVOLATILE ORGANICS			**SW8270C**		**(SW3520C)**		Analyst: **CO**
1&2-Chloronaphthalene	< 1.27	A	1.27	10.0	µg/L	1	11/20/2009 5:15:00 PM
1,2,4,5-Tetrachlorobenzene	< 0.617		0.617	10.0	µg/L	1	11/20/2009 5:15:00 PM
1,2,4-Trichlorobenzene	< 0.585		0.585	5.00	µg/L	1	11/20/2009 5:15:00 PM
1,2-Dichlorobenzene	< 0.711		0.711	5.00	µg/L	1	11/20/2009 5:15:00 PM
1,2-Diphenylhydrazine	< 0.553		0.553	5.00	µg/L	1	11/20/2009 5:15:00 PM
1,3-Dichlorobenzene	< 0.764		0.764	5.00	µg/L	1	11/20/2009 5:15:00 PM
1,4-Dichlorobenzene	< 0.871		0.871	5.00	µg/L	1	11/20/2009 5:15:00 PM
1-Naphthylamine	< 0.932	A	0.932	10.0	µg/L	1	11/20/2009 5:15:00 PM
2,3,4,6-Tetrachlorophenol	< 1.19		1.19	10.0	µg/L	1	11/20/2009 5:15:00 PM
2,4,5-Trichlorophenol	< 0.861		0.861	6.00	µg/L	1	11/20/2009 5:15:00 PM
2,4,6-Trichlorophenol	< 0.614		0.614	5.00	µg/L	1	11/20/2009 5:15:00 PM
2,4-Dichlorophenol	< 0.768		0.768	5.00	µg/L	1	11/20/2009 5:15:00 PM
2,4-Dimethylphenol	< 0.785		0.785	5.00	µg/L	1	11/20/2009 5:15:00 PM
2,4-Dinitrophenol	< 1.12		1.12	50.0	µg/L	1	11/20/2009 5:15:00 PM
2,4-Dinitrotoluene	< 0.627		0.627	10.0	µg/L	1	11/20/2009 5:15:00 PM
2,6-Dichlorophenol	< 0.492		0.492	5.00	µg/L	1	11/20/2009 5:15:00 PM
2,6-Dinitrotoluene	< 0.712		0.712	5.00	µg/L	1	11/20/2009 5:15:00 PM
2-Chlorophenol	< 0.606		0.606	5.00	µg/L	1	11/20/2009 5:15:00 PM
2-Methylnaphthalene	< 0.542		0.542	5.00	µg/L	1	11/20/2009 5:15:00 PM
2-Methylphenol	< 0.633		0.633	5.00	µg/L	1	11/20/2009 5:15:00 PM
2-Naphthylamine	< 0.562		0.562	5.00	µg/L	1	11/20/2009 5:15:00 PM
2-Nitroaniline	< 0.929		0.929	5.00	µg/L	1	11/20/2009 5:15:00 PM
2-Nitrophenol	< 0.534		0.534	5.00	µg/L	1	11/20/2009 5:15:00 PM
2-Picoline	< 0.766		0.766	5.00	µg/L	1	11/20/2009 5:15:00 PM

Qualifiers:

A Not Available for Accreditation
E Value Above Quantitation Range
J Analyte Detected Below Quantitation Limits
S Spike Recovery Outside Recovery Limits
B Analyte Detected in Method Blank
H Holding Time Exceeded
N Not Accredited
X Value Exceeds Maximum Contaminant Level (MCL)

PQL: Practical Quantitation Limit

LCRA Environmental Laboratory Services

Date: *23-Nov-09*

CLIENT: COA WPDR
Lab Order: 0911254
Project: Emergency Investigations
Lab ID: 0911254-001

Client Sample ID: 759-Deep Eddy Well U/S
Collection Date: 11/10/2009 11:00:00 AM
Matrix: GROUNDWATER
Tag No:

Analyses	Result	Qual	MDL	PQL	Units	DF	Date Analyzed
SEMIVOLATILE ORGANICS			**SW8270C**		**(SW3520C)**		Analyst: **CO**
3,3'-Dichlorobenzidine	< 0.886		0.886	5.00	µg/L	1	11/20/2009 5:15:00 PM
3-Methylcholanthrene	< 0.647		0.647	5.00	µg/L	1	11/20/2009 5:15:00 PM
3-Nitroaniline	< 0.640		0.640	5.00	µg/L	1	11/20/2009 5:15:00 PM
4,6-Dinitro-2-methylphenol	< 0.863		0.863	50.0	µg/L	1	11/20/2009 5:15:00 PM
4-Aminobiphenyl	< 0.632		0.632	5.00	µg/L	1	11/20/2009 5:15:00 PM
4-Bromophenyl phenyl ether	< 0.651		0.651	5.00	µg/L	1	11/20/2009 5:15:00 PM
4-Chloro-3-methylphenol	< 0.596		0.596	5.00	µg/L	1	11/20/2009 5:15:00 PM
4-Chloroaniline	< 1.07		1.07	5.00	µg/L	1	11/20/2009 5:15:00 PM
4-Chlorophenyl phenyl ether	< 0.573		0.573	5.00	µg/L	1	11/20/2009 5:15:00 PM
4-Nitroaniline	< 1.52		1.52	15.0	µg/L	1	11/20/2009 5:15:00 PM
4-Nitrophenol	< 1.14		1.14	10.0	µg/L	1	11/20/2009 5:15:00 PM
7,12-Dimethylbenz(a)anthracene	< 0.648		0.648	5.00	µg/L	1	11/20/2009 5:15:00 PM
Acenaphthene	< 0.648		0.648	5.00	µg/L	1	11/20/2009 5:15:00 PM
Acenaphthylene	< 0.725		0.725	5.00	µg/L	1	11/20/2009 5:15:00 PM
Acetophenone	< 0.599		0.599	5.00	µg/L	1	11/20/2009 5:15:00 PM
Aniline	< 1.38		1.38	5.00	µg/L	1	11/20/2009 5:15:00 PM
Anthracene	< 0.926		0.926	5.00	µg/L	1	11/20/2009 5:15:00 PM
Atrazine	< 1.32	N	1.32	5.00	µg/L	1	11/20/2009 5:15:00 PM
Benzidine	< 2.71		2.71	5.00	µg/L	1	11/20/2009 5:15:00 PM
Benzo(a)anthracene	< 0.700		0.700	5.00	µg/L	1	11/20/2009 5:15:00 PM
Benzo(a)pyrene	< 0.801		0.801	5.00	µg/L	1	11/20/2009 5:15:00 PM
Benzo(b)fluoranthene	< 0.886		0.886	5.00	µg/L	1	11/20/2009 5:15:00 PM
Benzo(g,h,i)perylene	< 0.959		0.959	15.0	µg/L	1	11/20/2009 5:15:00 PM
Benzo(k)fluoranthene	< 0.988		0.988	5.00	µg/L	1	11/20/2009 5:15:00 PM
Benzoic acid	< 1.73		1.73	50.0	µg/L	1	11/20/2009 5:15:00 PM
Benzyl alcohol	< 0.594		0.594	10.0	µg/L	1	11/20/2009 5:15:00 PM
Bis(2-chloroethoxy)methane	< 0.775		0.775	5.00	µg/L	1	11/20/2009 5:15:00 PM
Bis(2-chloroethyl)ether	< 0.807		0.807	5.00	µg/L	1	11/20/2009 5:15:00 PM
Bis(2-chloroisopropyl)ether	< 0.652		0.652	5.00	µg/L	1	11/20/2009 5:15:00 PM
Bis(2-ethylhexyl)phthalate	< 0.619		0.619	5.00	µg/L	1	11/20/2009 5:15:00 PM
Butyl benzyl phthalate	< 0.670		0.670	5.00	µg/L	1	11/20/2009 5:15:00 PM
Carbaryl	< 0.567		0.567	5.00	µg/L	1	11/20/2009 5:15:00 PM
Carbazole	< 0.621		0.621	5.00	µg/L	1	11/20/2009 5:15:00 PM
Chrysene	< 0.884		0.884	5.00	µg/L	1	11/20/2009 5:15:00 PM
Cresols, Total	< 1.50	A	1.50	10.0	µg/L	1	11/20/2009 5:15:00 PM
Di-n-butyl phthalate	< 0.594		0.594	5.00	µg/L	1	11/20/2009 5:15:00 PM
Di-n-octyl phthalate	< 0.870		0.870	5.00	µg/L	1	11/20/2009 5:15:00 PM
Dibenz(a,j)acridine	< 0.769		0.769	10.0	µg/L	1	11/20/2009 5:15:00 PM
Dibenz(a,h)anthracene	< 0.567		0.567	10.0	µg/L	1	11/20/2009 5:15:00 PM
Dibenzofuran	< 0.673		0.673	5.00	µg/L	1	11/20/2009 5:15:00 PM

Qualifiers:

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H Holding Time Exceeded
N Not Accredited
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LCRA Environmental Laboratory Services

Date: *23-Nov-09*

CLIENT: COA WPDR
Lab Order: 0911254
Project: Emergency Investigations
Lab ID: 0911254-001

Client Sample ID: 759-Deep Eddy Well U/S
Collection Date: 11/10/2009 11:00:00 AM
Matrix: GROUNDWATER
Tag No:

Analyses	Result	Qual	MDL	PQL	Units	DF	Date Analyzed
SEMIVOLATILE ORGANICS			**SW8270C**		**(SW3520C)**		Analyst: **CO**
Diethyl phthalate	< 0.546		0.546	5.00	µg/L	1	11/20/2009 5:15:00 PM
Dimethyl phthalate	< 0.439		0.439	5.00	µg/L	1	11/20/2009 5:15:00 PM
Ethyl methanesulfonate	< 0.628		0.628	5.00	µg/L	1	11/20/2009 5:15:00 PM
Fluoranthene	< 0.719		0.719	5.00	µg/L	1	11/20/2009 5:15:00 PM
Fluorene	< 0.660		0.660	5.00	µg/L	1	11/20/2009 5:15:00 PM
Hexachlorobenzene	< 0.547		0.547	5.00	µg/L	1	11/20/2009 5:15:00 PM
Hexachlorobutadiene	< 0.640		0.640	5.00	µg/L	1	11/20/2009 5:15:00 PM
Hexachlorocyclopentadiene	< 0.628		0.628	10.0	µg/L	1	11/20/2009 5:15:00 PM
Hexachloroethane	< 0.610		0.610	5.00	µg/L	1	11/20/2009 5:15:00 PM
Indeno(1,2,3-cd)pyrene	< 0.760		0.760	10.0	µg/L	1	11/20/2009 5:15:00 PM
Isophorone	< 0.501		0.501	5.00	µg/L	1	11/20/2009 5:15:00 PM
m,p-cresol	< 0.924	A	0.924	10.0	µg/L	1	11/20/2009 5:15:00 PM
Methyl methanesulfonate	< 0.512		0.512	5.00	µg/L	1	11/20/2009 5:15:00 PM
N-Nitroso-di-n-butylamine	< 0.899		0.899	5.00	µg/L	1	11/20/2009 5:15:00 PM
N-Nitrosodi-n-propylamine	< 0.653		0.653	5.00	µg/L	1	11/20/2009 5:15:00 PM
N-Nitrosodiethylamine	< 0.665		0.665	20.0	µg/L	1	11/20/2009 5:15:00 PM
N-Nitrosodimethylamine	< 0.865		0.865	5.00	µg/L	1	11/20/2009 5:15:00 PM
N-Nitrosodiphenylamine	< 0.632		0.632	5.00	µg/L	1	11/20/2009 5:15:00 PM
N-Nitrosopiperidine	< 0.589		0.589	5.00	µg/L	1	11/20/2009 5:15:00 PM
Naphthalene	< 0.654		0.654	5.00	µg/L	1	11/20/2009 5:15:00 PM
Nitrobenzene	< 0.635		0.635	5.00	µg/L	1	11/20/2009 5:15:00 PM
p-Dimethylaminoazobenzene	< 0.546	A	0.546	10.0	µg/L	1	11/20/2009 5:15:00 PM
Pentachlorobenzene	< 0.413		0.413	5.00	µg/L	1	11/20/2009 5:15:00 PM
Pentachloronitrobenzene	< 0.840		0.840	5.00	µg/L	1	11/20/2009 5:15:00 PM
Pentachlorophenol	< 0.731		0.731	6.00	µg/L	1	11/20/2009 5:15:00 PM
Phenacetin	< 0.458		0.458	5.00	µg/L	1	11/20/2009 5:15:00 PM
Phenanthrene	< 0.636		0.636	5.00	µg/L	1	11/20/2009 5:15:00 PM
Phenol	< 0.709		0.709	8.00	µg/L	1	11/20/2009 5:15:00 PM
Pronamide	< 0.644		0.644	5.00	µg/L	1	11/20/2009 5:15:00 PM
Pyrene	< 0.686		0.686	10.0	µg/L	1	11/20/2009 5:15:00 PM
Pyridine	< 0.871		0.871	5.00	µg/L	1	11/20/2009 5:15:00 PM
Surr: 2,4,6-Tribromophenol	55.2		0	30-124	%REC	1	11/20/2009 5:15:00 PM
Surr: 2-Fluorobiphenyl	44.0		0	42-143	%REC	1	11/20/2009 5:15:00 PM
Surr: 2-Fluorophenol	39.9		0	17-121	%REC	1	11/20/2009 5:15:00 PM
Surr: 4-Terphenyl-d14	66.5		0	23-150	%REC	1	11/20/2009 5:15:00 PM
Surr: Nitrobenzene-d5	51.3		0	28-116	%REC	1	11/20/2009 5:15:00 PM
Surr: Phenol-d5	47.4		0	27-112	%REC	1	11/20/2009 5:15:00 PM
VOLATILES BY GC/MS			**SW8260B**				Analyst: **SG**
1,1,1-Trichloroethane	< 0.13		0.13	0.50	µg/L	1	11/11/2009 6:24:00 PM

Qualifiers:

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E Value Above Quantitation Range
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B Analyte Detected in Method Blank
H Holding Time Exceeded
N Not Accredited
X Value Exceeds Maximum Contaminant Level (MCL)

PQL: Practical Quantitation Limit

LCRA Environmental Laboratory Services

Date: *23-Nov-09*

CLIENT: COA WPDR
Lab Order: 0911254
Project: Emergency Investigations
Lab ID: 0911254-001

Client Sample ID: 759-Deep Eddy Well U/S
Collection Date: 11/10/2009 11:00:00 AM
Matrix: GROUNDWATER
Tag No:

Analyses	Result	Qual	MDL	PQL	Units	DF	Date Analyzed
VOLATILES BY GC/MS			**SW8260B**				Analyst: **SG**
1,1,2,2-Tetrachloroethane	< 0.06		0.06	1.00	µg/L	1	11/11/2009 6:24:00 PM
1,1,2-Trichloroethane	< 0.10		0.10	0.50	µg/L	1	11/11/2009 6:24:00 PM
1,1-Dichloroethane	< 0.16		0.16	0.50	µg/L	1	11/11/2009 6:24:00 PM
1,1-Dichloroethene	< 0.12		0.12	0.50	µg/L	1	11/11/2009 6:24:00 PM
1,2,3-Trichlorobenzene	< 0.09		0.09	0.50	µg/L	1	11/11/2009 6:24:00 PM
1,2,3-Trichloropropane	< 0.11		0.11	1.00	µg/L	1	11/11/2009 6:24:00 PM
1,2,4-Trichlorobenzene	< 0.08		0.08	0.50	µg/L	1	11/11/2009 6:24:00 PM
1,2-Dibromo-3-chloropropane	< 0.15		0.15	1.00	µg/L	1	11/11/2009 6:24:00 PM
1,2-Dibromoethane	< 0.09		0.09	1.00	µg/L	1	11/11/2009 6:24:00 PM
1,2-Dichlorobenzene	< 0.08		0.08	0.50	µg/L	1	11/11/2009 6:24:00 PM
1,2-Dichloroethane	< 0.15		0.15	0.50	µg/L	1	11/11/2009 6:24:00 PM
1,2-Dichloroethene, Total	< 0.21	A	0.21	0.50	µg/L	1	11/11/2009 6:24:00 PM
1,2-Dichloropropane	< 0.15		0.15	0.50	µg/L	1	11/11/2009 6:24:00 PM
1,3-Dichlorobenzene	< 0.07		0.07	0.50	µg/L	1	11/11/2009 6:24:00 PM
1,4-Dichlorobenzene	< 0.06		0.06	0.50	µg/L	1	11/11/2009 6:24:00 PM
2-Butanone	< 0.36		0.36	5.00	µg/L	1	11/11/2009 6:24:00 PM
2-Chloroethyl vinyl ether	< 0.12		0.12	0.50	µg/L	1	11/11/2009 6:24:00 PM
2-Hexanone	< 0.08		0.08	5.00	µg/L	1	11/11/2009 6:24:00 PM
4-Methyl-2-pentanone	< 0.13		0.13	5.00	µg/L	1	11/11/2009 6:24:00 PM
Acetone	< 0.43		0.43	5.00	µg/L	1	11/11/2009 6:24:00 PM
Acrolein	< 2.83		2.83	10.0	µg/L	1	11/11/2009 6:24:00 PM
Acrylonitrile	< 0.24		0.24	5.00	µg/L	1	11/11/2009 6:24:00 PM
Benzene	< 0.10		0.10	0.50	µg/L	1	11/11/2009 6:24:00 PM
Bromodichloromethane	< 0.13		0.13	0.50	µg/L	1	11/11/2009 6:24:00 PM
Bromoform	< 0.08		0.08	0.50	µg/L	1	11/11/2009 6:24:00 PM
Bromomethane	< 0.41		0.41	1.50	µg/L	1	11/11/2009 6:24:00 PM
Carbon Disulfide	< 0.15		0.15	0.50	µg/L	1	11/11/2009 6:24:00 PM
Carbon Tetrachloride	< 0.14		0.14	0.50	µg/L	1	11/11/2009 6:24:00 PM
Chlorobenzene	< 0.09		0.09	0.50	µg/L	1	11/11/2009 6:24:00 PM
Chloroethane	< 0.17		0.17	1.00	µg/L	1	11/11/2009 6:24:00 PM
Chloroform	< 0.12		0.12	0.50	µg/L	1	11/11/2009 6:24:00 PM
Chloromethane	< 0.13		0.13	0.50	µg/L	1	11/11/2009 6:24:00 PM
cis-1,2-Dichloroethene	< 0.09		0.09	0.50	µg/L	1	11/11/2009 6:24:00 PM
cis-1,3-Dichloropropene	< 0.10		0.10	0.50	µg/L	1	11/11/2009 6:24:00 PM
Dibromochloromethane	< 0.10		0.10	0.50	µg/L	1	11/11/2009 6:24:00 PM
Dibromomethane	< 0.11		0.11	0.50	µg/L	1	11/11/2009 6:24:00 PM
Dichlorodifluoromethane	< 0.17		0.17	1.00	µg/L	1	11/11/2009 6:24:00 PM
Ethyl Methacrylate	< 0.06		0.06	1.00	µg/L	1	11/11/2009 6:24:00 PM
Ethylbenzene	< 0.10		0.10	0.50	µg/L	1	11/11/2009 6:24:00 PM
Iodomethane	< 0.12		0.12	0.50	µg/L	1	11/11/2009 6:24:00 PM

Qualifiers:

A Not Available for Accreditation
E Value Above Quantitation Range
J Analyte Detected Below Quantitation Limits
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H Holding Time Exceeded
N Not Accredited
X Value Exceeds Maximum Contaminant Level (MCL)

PQL: Practical Quantitation Limit

LCRA Environmental Laboratory Services

Date: *23-Nov-09*

CLIENT: COA WPDR
Lab Order: 0911254
Project: Emergency Investigations
Lab ID: 0911254-001

Client Sample ID: 759-Deep Eddy Well U/S
Collection Date: 11/10/2009 11:00:00 AM
Matrix: GROUNDWATER
Tag No:

Analyses	Result	Qual	MDL	PQL	Units	DF	Date Analyzed
VOLATILES BY GC/MS			**SW8260B**				Analyst: **SG**
m,p-Xylene	< 0.23		0.23	1.00	µg/L	1	11/11/2009 6:24:00 PM
Methyl tert-butyl ether	< 0.16		0.16	0.50	µg/L	1	11/11/2009 6:24:00 PM
Methylene chloride	< 0.10		0.10	0.50	µg/L	1	11/11/2009 6:24:00 PM
Naphthalene	< 0.06		0.06	0.50	µg/L	1	11/11/2009 6:24:00 PM
o-Xylene	< 0.09		0.09	0.50	µg/L	1	11/11/2009 6:24:00 PM
Styrene	< 0.10		0.10	0.50	µg/L	1	11/11/2009 6:24:00 PM
Tetrachloroethene	0.23	J	0.12	0.50	µg/L	1	11/11/2009 6:24:00 PM
Toluene	< 0.09		0.09	0.50	µg/L	1	11/11/2009 6:24:00 PM
trans-1,2-Dichloroethene	< 0.12		0.12	0.50	µg/L	1	11/11/2009 6:24:00 PM
trans-1,3-Dichloropropene	< 0.09		0.09	0.50	µg/L	1	11/11/2009 6:24:00 PM
trans-1,4-Dichloro-2-butene	< 0.11		0.11	0.50	µg/L	1	11/11/2009 6:24:00 PM
Trichloroethene	< 0.13		0.13	0.50	µg/L	1	11/11/2009 6:24:00 PM
Trichlorofluoromethane	< 0.17		0.17	0.50	µg/L	1	11/11/2009 6:24:00 PM
Vinyl Acetate	< 0.11		0.11	0.50	µg/L	1	11/11/2009 6:24:00 PM
Vinyl chloride	< 0.24		0.24	1.00	µg/L	1	11/11/2009 6:24:00 PM
Xylenes, Total	< 0.21		0.21	0.50	µg/L	1	11/11/2009 6:24:00 PM
Surr: 1,2-Dichloroethane-d4	102		0	70-130	%REC	1	11/11/2009 6:24:00 PM
Surr: 4-Bromofluorobenzene	102		0	70-130	%REC	1	11/11/2009 6:24:00 PM
Surr: Toluene-d8	101		0	70-130	%REC	1	11/11/2009 6:24:00 PM
OIL AND GREASE, HEM			**E1664**				Analyst: **MH**
Oil & Grease, Total Recoverable	< 0.40		0.40	2.52	mg/L	1	11/13/2009
ANIONS BY ION CHROMATOGRAPHY			**E300.0**				Analyst: **WR**
Chloride	44.4		0.017	1.00	mg/L	1	11/11/2009 3:05:00 PM
Fluoride	0.294		0.002	0.010	mg/L	1	11/11/2009 3:05:00 PM
Phosphorus, Orthophosphate (As P)	0.032		0.002	0.010	mg/L	1	11/11/2009 3:05:00 PM
Sulfate	44.1		0.015	1.00	mg/L	1	11/11/2009 3:05:00 PM
ALKALINITY			**SM2320 B**				Analyst: **JB**
Alkalinity, Total (As CaCO3)	305		0.1	2	mg/L CaCO3	1	11/11/2009
NITRATE AND NITRITE			**SM4500-NO3-H**				Analyst: **KK**
Nitrogen, Nitrate & Nitrite	1.41		0.004	0.020	mg/L	1	11/12/2009
AMMONIA AS N			**E350.1**				Analyst: **ML**
Nitrogen, Ammonia (As N)	< 0.005		0.005	0.020	mg/L	1	11/16/2009
ORGANIC CARBON, TOTAL			**SM5310D**				Analyst: **CM**
Organic Carbon, Total	0.860		0.025	0.500	mg/L	1	11/12/2009
TOTAL SUSPENDED SOLIDS			**SM2540D**				Analyst: **JB**

Qualifiers:

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E Value Above Quantitation Range
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H Holding Time Exceeded
N Not Accredited
X Value Exceeds Maximum Contaminant Level (MCL)

PQL: Practical Quantitation Limit

LCRA Environmental Laboratory Services

Date: *23-Nov-09*

CLIENT:	COA WPDR	**Client Sample ID:**	759-Deep Eddy Well U/S
Lab Order:	0911254	**Collection Date:**	11/10/2009 11:00:00 AM
Project:	Emergency Investigations	**Matrix:**	GROUNDWATER
Lab ID:	0911254-001	**Tag No:**	

Analyses	Result	Qual	MDL	PQL	Units	DF	Date Analyzed
TOTAL SUSPENDED SOLIDS			**SM2540D**				Analyst: **JB**
Suspended Solids (Residue, Non-Filterable)	1.2		0.5	1.0	mg/L	1	11/16/2009
VOLATILE SUSPENDED SOLIDS			**E160.4**				Analyst: **JB**
Volatile Suspended Solids	< 0.500		0.500	1.00	mg/L	1	11/16/2009

Qualifiers:

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