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October 29, 2013

Mr. Benjamin Rung
Division of Environmental Remediation
New York State Department of Environmental Conservation
625 Broadway
Albany, NY 12233-7013

RE: Claremont Polychemical Superfund Site (Site # 130015), Step Drawdown Test Results with Groundwater Recovery Rate Recommendations

Dear Mr. Rung:

HRP Engineering P.C. (HRP) has completed extraction well reconfigurations and step tests at the Claremont Polychemical Superfund site (Claremont) in Old Bethpage, New York (Figure 1). The modifications were implemented to achieve the following objectives.

- Optimize the groundwater treatment system (GWTS) operations,
- Contain Claremont contaminant plume(s), and
- Capture portions of a regional plume that originates from up-gradient source(s).

HRP documented evaluation of the GWTS operations in the *Remedial System Optimization (RSO) Report* (August 2012). The RSO determined that capture of the Claremont plume could be achieved at reduced GWTS pumping rates. Based on the results of the RSO, the scope of reconfiguration and flow rate evaluation included:

- Groundwater sampling to determine the vertical contaminant profile in the extraction wells,
- Installation of inflatable packers at EX-1 and EX-2 to optimize pumping well screen lengths,
- Evaluation of optimal well pumping rates using Step Tests, and
- Groundwater modeling to re-assess the degree of plume capture.

The following provides project background and summarizes implementation of the system modifications.

1.0 Project Background

The Claremont Polychemical Corporation (CPC) manufactured pigments for inks and dyes, coated metal flakes (Durogold), coated aluminum powders, and vinyl stabilizers for 14 years between 1966 and 1980. Following several inspections and investigations, EPA placed CPC on the National Priorities List (NPL) in 1986. By 1990, EPA prepared two Records of Decision (RODs) outlining specific remediation tasks and goals. EPA released additional Explanations of Significant Differences (ESDs) by 2003, which expanded the remediation scope.

Collectively, the RODs and ESDs established 8 Operable Units (OUs) that defined the scope of the site remedy. The GWTS was required by OU IV and OU V described in the 1989 ROD. The EPA and Army Corp of Engineers (ACOE) activated and operated the GWTS between 2000 and 2011. In May 2011, EPA relinquished operations to the NYSDEC. HRP completed the 2012 RSO as a multi-tiered approach to improving the efficiency, effectiveness and net environmental benefit of the remedial solution.

The 10-acre CPC site is located in an industrial area characterized by regional groundwater impacts. Four VOC contaminant sources (including trichloroethylene [TCE], Tetrachloroethylene [PCE] and 1,1,1-Trichloroethane [TCA]) have been documented within 2,000-ft of Claremont:

1. Old Bethpage Landfill Superfund Site (OBL)
2. Nassau County Fire Training Center (NCFTC)
3. Aluminum Louvre Corporation (aka. American Louvre Corporation)
4. Trulite Louvre (former Filtron Corporation)

The RSO concluded a groundwater contaminant plume emanating from Aluminum Louvre extended onto and beyond the Claremont site.

Geological Setting

At the Claremont site, the Upper Glacial/Manetto Gravel is absent and the Magothy Formation (Fm) is the surficial deposit. The Magothy Fm is the uppermost water-bearing unit and the sole-source aquifer supplying potable drinking water to the majority of Long Island. It is an unconfined aquifer and the water table is typically encountered between 65 and 95 feet bgs. The saturated thickness is assumed to be 650 to 700 feet.

Site-specific subsurface data obtained from the many historic soil borings and wells drilled on-site also characterize the stratigraphy of the Magothy Fm to a maximum depth of 250 feet below ground surface (bgs). These materials have been described as a well-stratified fine to medium sand with silt lenses, abundant peat laminae, and discontinuous sand layers. Borings in the northern portion of the site also encountered numerous interbedded silt and clay horizons. A comparison of site drill logs with logs for municipal supply wells to the north suggest that Claremont is located within a transitional area between the predominantly sandy portion of the Magothy Fm to the south and an interbedded clayey-sand portion to the north. The Site is located in an unconfined aquifer and the water table is typically encountered between 65 and 95 feet bgs. The saturated thickness is assumed to be 650 to 700 feet. Local water supply wells are typically screened within the intermediate and lower portions of the Magothy Fm to intercept coarse, gravel-rich layers.

2.0 Extraction Well Contaminant Profile

In order to create a vertical profile of the VOC contamination existing in each extraction well a series of 18-inch passive diffusion bags (PDBs) were installed at various depths in each of the extraction wells (EX-1 through EX-3) (Figure 2). On December 6, 2012, the recovery pumps were removed from the

three extraction wells and a series of passive diffusion bags (PDBs) were deployed to pre-determined depths to evaluate the contributing zones of contamination in each extraction well and generate a contaminant profile. This data was used to optimize pump placements, determine packer depth placement, and to identify data gaps.

The PDBs were installed at the following depths in feet below grade (fbg):

- EX-1: 83', 93', 103', 129', 139', 149', 159', 169',
- EX-2: 99', 109', 119', 141', 151', 161', 171', 181', and
- EX-3: 99', 109', 119', 129', 139', 155', 165', 175', 185'.

On December 27, 2012, the PDBs were retrieved and groundwater samples were collected for laboratory analysis for VOCs (EPA method 8260). Analytical results are provided in Attachment 1 and discussed below for each extraction well:

- EX-1 – No VOCs were detected at concentrations exceeding applicable water quality standards. However low level VOC concentrations were detected in the top of the contamination layer.
- EX-2 – TCE (6.0 microgram per liter [ug/L]) and PCE (17.0 ug/L) concentrations exceeded water quality standards in only the shallowest sample (99' below grade). These shallow VOC detections indicate that the source of contamination may be local to EX-2 and may be a result of contamination from the Claremont site.
- EX-3 – TCE was detected at concentrations exceeding the water quality standards in all sampled horizons, with minimum concentrations at 99' (5.3 ug/L) and maximum concentrations detected at the 175' interval (20 ug/L). While this indicates the predominance of an off-site plume, impacts from the Claremont site cannot be ruled out. PCE exceedances were observed in the uppermost three sampling horizons [99' (8.7 ug/L), 109' (7.4 ug/L), 119' (5.9 ug/L)] indicating a potential local release from the Claremont site.

3.0 Packer Installation

The contaminant profiles in recovery wells EX-1 and EX-2 indicated that only shallow groundwater containing concentrations of VOCs requires capture. Both of these wells are constructed with two screened intervals (shallow and deep) separated by unscreened interval (see well construction logs located in Attachment 2). Packers are expandable rubber bladders that are lowered into a well and inflated to the extent of the inner casing in order to prevent the vertical flow of water within a well and allow only water form specific depths to be pumped from the well, effectively shortening the depth of the well.

HRP mobilized to the site in May 2013 in order to install packers in EX-1 and EX-2. Since the groundwater contamination was detected in the uppermost portion of the extraction wells, packers were installed at depths of 115 fbg (feet below grade) and 125 fbg in EX-1 and EX-2, respectively. This isolated the deeper screened section in each of these wells, allowing only the VOC contaminated water from the shallow screened interval to be pumped to the GWTS. Specifications on the typical packer style in EX-1 and EX-2 are included in Attachment 3.

4.0 Step-Drawdown Tests

In order to estimate yield needed to capture the remaining contamination at the Site, HRP conducted a step-drawdown test at each 10-inch diameter extraction well (EX-1, EX-2, EX-3). A step-drawdown test is designed to investigate the performance of a single well under variable pumping conditions. In a step-drawdown test, the discharge rate in the pumping well is increased from an initially low constant pumping rate through a series of pumping intervals (steps) of progressively higher constant pumping rates. The step-drawdown test at Claremont was started at 80 gpm due to the well pumps high capacity pumping range. Each step is typically of equal duration, lasting from approximately 30 minutes to 1 hour this was sufficient duration to allow dissipation of wellbore storage effects.

Prior to the start of each step-drawdown test, the GWTS was shut down for a period of at least 30 minutes. This was sufficient to allow the aquifer to recover and equilibrate to at least 90% of static level. Each step-drawdown test was comprised of 4 pumping rate levels followed by a recovery period. After a review of the step-drawdown test data generated from EX-1 completed on June 26, 2013, it was determined that the extraction wells stabilized within under ten minutes of each new pumping rate, so the duration of each pumping interval was lowered to 30 minutes to in order to minimize testing time. During each test, water levels were recorded automatically using pressure transducers and the existing SCADA system. Monitor wells EW-2A, EW-2B, EW-2C, EW-2D, MW-8A, MW-8B, and MW-8C were also utilized as observation wells during the step-draw down test. However due to the distance from the pumping wells, no drawdown was observed and the information was not used.

The specifics of the test phases for step-draw down test are listed below.

Test Phase	Duration (time on or recovery) (min)	Flow Rate (gpm)	Transducer Logging Interval (sec)
Per-test	60/30	0	15
Step 1	60/30	80	15
Step 2	60/30	95	15
Step 3	60/30	110	15
Step 4	60/30	120	15
Step 4	60/30	135 (or pump max)	15
Recovery	120/60	0	15

The drawdown data, collected with the pressure transducers at each test well (EX-1, EX-2, EX-3) was used to identify aquifer type and estimate hydraulic conductivity, specific capacity, and well efficiency. This information was evaluated to identify a target constant flow rate for each well to achieve Site goals identified in the RSO.

Diagnostic plots of extraction well drawdown data were evaluated to identify the aquifer type and the appropriate method to estimate aquifer constants (hydraulic conductivity, transmissivity). The diagnostic plots indicated an unconfined aquifer and the Hantush curve fitting method was utilized to estimate the aquifer constants tabulated below.

System Optimization Steps

The flow rates were adjusted by opening the individual line globe value manually.

The resultant time-drawdown data was analyzed using the Hantush Method formula. The time-drawdown graphs, calculations of transmissivity values, and supporting information are provided below and in Attachment 4.

Aquifer Constant EW-1	80 gpm	95 gpm	110 gpm	120 gpm	135 gpm	Average
Hydraulic Conductivity (ft/day)	50.58	85.66	85.66	85.66	85.66	85.66
Transmissivity (ft^2/day)	770.9	2,827	2,827	2,827	2,827	2,827

Aquifer Constant EW-2	80 gpm	95 gpm	110 gpm	120 gpm	135 gpm	Average
Hydraulic Conductivity (ft/day)	82.07	85.66	89.4	89.4	89.4	87.9
Transmissivity (ft^2/day)	2,708	2,827	2,950	2,950	2,950	2,901

Aquifer Constant EW-3	80 gpm	95 gpm	110 gpm	120 gpm	135 gpm	Average
Hydraulic Conductivity (ft/day)	29.5	29.5	0	29.5	29.5	29.5
Transmissivity (ft^2/day)	2,950	2,950	0	2,950	2,950	2,950

5.0 Groundwater Model

Two groundwater flow models have been developed and calibrated for Claremont. An initial model was prepared by Science Applications International Corporation (SAIC) in 2003. HRP revised and re-calibrated this model as part of the RSO evaluation in 2012. Following completion of the step tests, the 2012 model was updated with the packer depth and updated hydraulic conductivity values data generated during the June 2013 step-draw down test. This updated model was used to analyze multiple pumping scenarios and corresponding capture zones. The particle tracking function was utilized to evaluate capture of the shortened wells at various pumping rates. Particles that would have only originated from the Claremont property and additional deeper up gradient source were tracked as part of the analysis.

The installation of the packers in extraction wells EX-1 and EX-2 effectively shortened the well depths, limited upward mobility of groundwater in the wells and concentrated the remedial areas to areas with remaining impact. The packers installed in EX-1 and EX-2 are designed to prevent the migration of contamination from the shallower unconfined layer to deeper layers within each of those particular wells and therefore limiting the off-site migration of contamination deeper in the subsurface.

The recent model scenarios confirm that extraction well pumping rates could be reduced up to 80% of the current state (ie pumping rates for all wells could be reduced by 20% from what they currently are) and still capture all contaminants originating from the Claremont property. Some directly up-gradient contamination would still be captured by Claremont's extraction wells, but the amount would be less than what is currently being captured.

Capture Zone Determination and Scenario

Based on the resulting step drawdown test analysis, the scenarios were identified which are able to maintain a capture zone which spans the site from MW-8a to the EW-4 cluster.

The table below presents the revised pumping rates:

EX-1 Pumping Rate (GPM)	EX-2 Pumping Rate (GPM)	EX-3 Pumping Rate (GPM)	Total Flow (GPM)
110	120	135	365

6.0 Conclusions And Recommendations

The step-down test data was entered into the 2012 model to help determine capture zones based on current site conditions. The placement of the packers in EX-1 and EX-2 effectively shortened the fully penetrating depth of the aquifer, limiting the remediation of clean groundwater.

Based upon the results of the step-draw down test evaluation including modeling the site based on parameters previously determined by HRP, and the installation of the packers to limit vertical movement of water in the recovery wells, the pumping rates are suggested to be reduced in each EX-1 and EX-2 by up to 20% to effectively capture the plume while reducing the capture of clean groundwater. The model suggests that the capture zone with up to a 20% reduction in flow rates contains the Claremont plume. However in order to incorporate factors not accounted by the model or changing conditions on site HRP recommends a 10% percentage reduction in order to reduce overall influent clean groundwater and limit capture from the up-gradient plume/source while maintaining the capture from contamination originating on-site from EX-1 and EX-2. The model was run as steady-state and assumes homogeneous hydraulic conductivities within each specified zone and is used as a tool. For extraction well EX-3, based on the TCE exceedances of water quality standards in all sampled horizons and its proximity to the plume, a decrease in pumping rates is not recommended.

Additionally, the fewer gallons generated under the new pumping rates will produce less volume of water in the equalization tank and treatment train, allowing for longer time periods between extraction well shut off due to equalization tank reaching maximum capacity.

If you have any further questions or comments, please do not hesitate to call HRP at 518.877.7101.

Sincerely,

HRP ENGINERING, P.C.

Jennifer Kotch
Senior Project Geologist

Nancy Garry, P.E.
Project Manager

Attachments

Attachment 1

Laboratory Analytical

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

Job Number: 460-48904-1

Job Description: Site No: 130015 Claremont Polychemical

For:
HRP Associates, Inc.
197 Scott Swamp Road
Farmington, CT 06032

Attention: Jenny Mooney

Jennifer R. Capece

Approved for release.
Jennifer Capece
Project Mgmt. Assistant
1/9/2013 1:37 PM

Designee for
Melissa Haas
Project Manager I
melissa.haas@testamericainc.com
01/09/2013

cc: Mr. Adam G Fox, PE
Ms. Nancy Garry

The test results in this report meet all NELAP requirements unless specified within the case narrative. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory. All questions regarding this report should be directed to the TestAmerica Edison Project Manager.

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TestAmerica Edison 777 New Durham Road, Edison, NJ 08817
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Job Number: 460-48904-1

Job Description: Site No: 130015 Claremont Polychemical

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed within the body of this report. Release of the data contained in this sample data package and in the electronic data deliverable has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Jennifer R. Capece

Approved for release.
Jennifer Capece
Project Mgmt. Assistant
1/9/2013 1:37 PM

Designee for
Melissa Haas

CASE NARRATIVE

Client: HRP Associates, Inc.

Project: Site No: 130015 Claremont Polychemical

Report Number: 460-48904-1

This case narrative is in the form of an exception report, where only the anomalies related to this report, method specific performance and/or QA/QC issues are discussed. If there are no issues to report, this narrative will include a statement that documents that there are no relevant data issues.

It should be noted that samples with elevated Reporting Limits (RLs) as a result of a dilution may not be able to satisfy customer reporting limits in some cases. Such increases in the RLs are unavoidable but acceptable consequence of sample dilution that enables quantification of target analytes or interferences which exceed the calibration range of the instrument.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

The samples were received on 12/27/2012; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 1.4 C.

Except:

One or more containers for the following sample was received broken or leaking: EX2-099-CP-00-122712 (460-48904-9). One of the three vials was broken on receipt.

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2C of the required temperature or method specified range. For samples with a specified temperature of 4C, samples with a temperature ranging from just above freezing temperature of water to 6C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

VOLATILE ORGANIC COMPOUNDS (GC-MS)

Samples 460-48904-1 through 460-48904-28 were analyzed for volatile organic compounds (GC-MS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 01/07/2013 and 01/08/2013.

1,2,3-Trichlorobenzene, 1,2,4-Trichlorobenzene, Isopropylbenzene and Styrene failed the recovery criteria high for the MSD of sample 460-48904-9 in batch 460-142135.

The following trip blank contained a detection for Chloroform above the method detection limit (MDL), and detections for Bromoform and Chlorodibromomethane above the reporting limits (RLs): TB-01-CP-QC-122712 (460-48904-27).

Refer to the QC report for details.

No other difficulties were encountered during the volatiles analyses.

All other quality control parameters were within the acceptance limits.

SAMPLE SUMMARY

Client: HRP Associates, Inc.   Job Number: 460-48904-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
460-48904-1	EX1-083-CP-00-122712	Water	12/27/2012 0734	12/27/2012 1500
460-48904-2	EX1-093-CP-00-122712	Water	12/27/2012 0734	12/27/2012 1500
460-48904-3	EX1-103-CP-00-122712	Water	12/27/2012 0734	12/27/2012 1500
460-48904-4	EX1-129-CP-00-122712	Water	12/27/2012 0734	12/27/2012 1500
460-48904-5	EX1-139-CP-00-122712	Water	12/27/2012 0734	12/27/2012 1500
460-48904-6	EX1-149-CP-00-122712	Water	12/27/2012 0734	12/27/2012 1500
460-48904-7	EX1-159-CP-00-122712	Water	12/27/2012 0734	12/27/2012 1500
460-48904-8	EX1-169-CP-00-122712	Water	12/27/2012 0734	12/27/2012 1500
460-48904-9	EX2-099-CP-00-122712	Water	12/27/2012 0742	12/27/2012 1500
460-48904-10	EX2-109-CP-00-122712	Water	12/27/2012 0742	12/27/2012 1500
460-48904-11	EX2-119-CP-00-122712	Water	12/27/2012 0742	12/27/2012 1500
460-48904-12	EX2-141-CP-00-122712	Water	12/27/2012 0742	12/27/2012 1500
460-48904-13	EX2-151-CP-00-122712	Water	12/27/2012 0742	12/27/2012 1500
460-48904-14	EX2-161-CP-00-122712	Water	12/27/2012 0742	12/27/2012 1500
460-48904-15	EX2-171-CP-00-122712	Water	12/27/2012 0742	12/27/2012 1500
460-48904-16	EX2-181-CP-00-122712	Water	12/27/2012 0742	12/27/2012 1500
460-48904-17	EX3-099-CP-00-122712	Water	12/27/2012 0749	12/27/2012 1500
460-48904-18	EX3-109-CP-00-122712	Water	12/27/2012 0749	12/27/2012 1500
460-48904-19	EX3-119-CP-00-122712	Water	12/27/2012 0749	12/27/2012 1500
460-48904-20	EX3-129-CP-00-122712	Water	12/27/2012 0749	12/27/2012 1500
460-48904-21	EX03-139-CP-00-122712	Water	12/27/2012 0749	12/27/2012 1500
460-48904-22	EX3-155-CP-00-122712	Water	12/27/2012 0749	12/27/2012 1500
460-48904-23	EX3-165-CP-00-122712	Water	12/27/2012 0749	12/27/2012 1500
460-48904-24	EX3-175-CP-00-122712	Water	12/27/2012 0749	12/27/2012 1500
460-48904-25	EX3-185-CP-00-122712	Water	12/27/2012 0749	12/27/2012 1500
460-48904-26	EX2-181-CP-01-122712	Water	12/27/2012 0742	12/27/2012 1500
460-48904-27	TB-01-CP-QC-122712	Water	12/27/2012 0600	12/27/2012 1500
460-48904-28	RB-01-CP-QC-122712	Water	12/27/2012 0905	12/27/2012 1500

EXECUTIVE SUMMARY - Detections

Client: HRP Associates, Inc. Job Number: 460-48904-1

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
460-48904-1	**EX1-083-CP-00-122712**					
Acetone		11		5.0	ug/L	8260B
cis-1,2-Dichloroethene		1.3		1.0	ug/L	8260B
1,1,1-Trichloroethane		0.16	J	1.0	ug/L	8260B
Trichloroethene		1.9		1.0	ug/L	8260B
Tetrachloroethene		0.51	J	1.0	ug/L	8260B
Cyclohexane		0.66	J	1.0	ug/L	8260B
460-48904-2	**EX1-093-CP-00-122712**					
Acetone		12		5.0	ug/L	8260B
cis-1,2-Dichloroethene		1.1		1.0	ug/L	8260B
Trichloroethene		1.6		1.0	ug/L	8260B
Tetrachloroethene		0.53	J	1.0	ug/L	8260B
Cyclohexane		0.65	J	1.0	ug/L	8260B
460-48904-3	**EX1-103-CP-00-122712**					
Acetone		10		5.0	ug/L	8260B
cis-1,2-Dichloroethene		0.92	J	1.0	ug/L	8260B
Trichloroethene		1.8		1.0	ug/L	8260B
Tetrachloroethene		0.56	J	1.0	ug/L	8260B
Cyclohexane		0.52	J	1.0	ug/L	8260B
460-48904-4	**EX1-129-CP-00-122712**					
Acetone		10		5.0	ug/L	8260B
cis-1,2-Dichloroethene		0.55	J	1.0	ug/L	8260B
Trichloroethene		1.1		1.0	ug/L	8260B
Tetrachloroethene		0.29	J	1.0	ug/L	8260B
Cyclohexane		0.51	J	1.0	ug/L	8260B
460-48904-5	**EX1-139-CP-00-122712**					
Acetone		10		5.0	ug/L	8260B
Trichloroethene		0.48	J	1.0	ug/L	8260B
Tetrachloroethene		0.20	J	1.0	ug/L	8260B
Cyclohexane		0.43	J	1.0	ug/L	8260B
460-48904-6	**EX1-149-CP-00-122712**					
Acetone		9.5		5.0	ug/L	8260B
Trichloroethene		0.44	J	1.0	ug/L	8260B
Tetrachloroethene		0.26	J	1.0	ug/L	8260B
Cyclohexane		0.50	J	1.0	ug/L	8260B

EXECUTIVE SUMMARY - Detections

Client: HRP Associates, Inc. Job Number: 460-48904-1

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
460-48904-7	**EX1-159-CP-00-122712**					
Acetone		13		5.0	ug/L	8260B
2-Butanone		2.5	J	5.0	ug/L	8260B
Trichloroethene		0.45	J	1.0	ug/L	8260B
Tetrachloroethene		0.25	J	1.0	ug/L	8260B
Cyclohexane		0.44	J	1.0	ug/L	8260B
460-48904-8	**EX1-169-CP-00-122712**					
Acetone		11		5.0	ug/L	8260B
Trichloroethene		0.45	J	1.0	ug/L	8260B
Tetrachloroethene		0.21	J	1.0	ug/L	8260B
Cyclohexane		0.60	J	1.0	ug/L	8260B
460-48904-9	**EX2-099-CP-00-122712**					
Acetone		13		5.0	ug/L	8260B
cis-1,2-Dichloroethene		8.2		1.0	ug/L	8260B
Trichloroethene		6.0		1.0	ug/L	8260B
Tetrachloroethene		17		1.0	ug/L	8260B
Cyclohexane		0.64	J	1.0	ug/L	8260B
460-48904-10	**EX2-109-CP-00-122712**					
Acetone		11		5.0	ug/L	8260B
cis-1,2-Dichloroethene		1.6		1.0	ug/L	8260B
Trichloroethene		2.7		1.0	ug/L	8260B
Tetrachloroethene		3.5		1.0	ug/L	8260B
Cyclohexane		0.52	J	1.0	ug/L	8260B
460-48904-11	**EX2-119-CP-00-122712**					
Acetone		13		5.0	ug/L	8260B
cis-1,2-Dichloroethene		1.5		1.0	ug/L	8260B
Trichloroethene		2.6		1.0	ug/L	8260B
Tetrachloroethene		2.8		1.0	ug/L	8260B
Cyclohexane		0.59	J	1.0	ug/L	8260B
460-48904-12	**EX2-141-CP-00-122712**					
Acetone		13		5.0	ug/L	8260B
cis-1,2-Dichloroethene		1.4		1.0	ug/L	8260B
Trichloroethene		2.8		1.0	ug/L	8260B
Tetrachloroethene		1.9		1.0	ug/L	8260B
Cyclohexane		0.55	J	1.0	ug/L	8260B

EXECUTIVE SUMMARY - Detections

Client: HRP Associates, Inc.   Job Number: 460-48904-1

Lab Sample ID Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
460-48904-13	**EX2-151-CP-00-122712**					
Acetone		13		5.0	ug/L	8260B
cis-1,2-Dichloroethene		1.2		1.0	ug/L	8260B
Trichloroethene		2.8		1.0	ug/L	8260B
Tetrachloroethene		1.6		1.0	ug/L	8260B
Cyclohexane		0.53	J	1.0	ug/L	8260B
460-48904-14	**EX2-161-CP-00-122712**					
Acetone		12		5.0	ug/L	8260B
cis-1,2-Dichloroethene		1.2		1.0	ug/L	8260B
Trichloroethene		2.6		1.0	ug/L	8260B
Tetrachloroethene		1.3		1.0	ug/L	8260B
Cyclohexane		0.86	J	1.0	ug/L	8260B
460-48904-15	**EX2-171-CP-00-122712**					
Acetone		13		5.0	ug/L	8260B
cis-1,2-Dichloroethene		1.1		1.0	ug/L	8260B
Trichloroethene		2.5		1.0	ug/L	8260B
Tetrachloroethene		1.4		1.0	ug/L	8260B
Cyclohexane		0.47	J	1.0	ug/L	8260B
460-48904-16	**EX2-181-CP-00-122712**					
Acetone		13		5.0	ug/L	8260B
cis-1,2-Dichloroethene		1.1		1.0	ug/L	8260B
Trichloroethene		2.4		1.0	ug/L	8260B
Tetrachloroethene		1.5		1.0	ug/L	8260B
Cyclohexane		0.35	J	1.0	ug/L	8260B
460-48904-17	**EX3-099-CP-00-122712**					
Acetone		12		5.0	ug/L	8260B
cis-1,2-Dichloroethene		0.41	J	1.0	ug/L	8260B
Chloroform		0.38	J	1.0	ug/L	8260B
1,1,1-Trichloroethane		0.23	J	1.0	ug/L	8260B
Trichloroethene		5.3		1.0	ug/L	8260B
Tetrachloroethene		8.7		1.0	ug/L	8260B
Cyclohexane		0.63	J	1.0	ug/L	8260B

EXECUTIVE SUMMARY - Detections

Client: HRP Associates, Inc. Job Number: 460-48904-1

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
460-48904-18	**EX3-109-CP-00-122712**					
Acetone		10		5.0	ug/L	8260B
Chloroform		0.29	J	1.0	ug/L	8260B
1,1,1-Trichloroethane		0.34	J	1.0	ug/L	8260B
Trichloroethene		5.9		1.0	ug/L	8260B
Tetrachloroethene		7.4		1.0	ug/L	8260B
Cyclohexane		0.45	J	1.0	ug/L	8260B
460-48904-19	**EX3-119-CP-00-122712**					
Acetone		11		5.0	ug/L	8260B
cis-1,2-Dichloroethene		0.56	J	1.0	ug/L	8260B
Chloroform		0.26	J	1.0	ug/L	8260B
1,1,1-Trichloroethane		0.50	J	1.0	ug/L	8260B
Trichloroethene		11		1.0	ug/L	8260B
Tetrachloroethene		5.9		1.0	ug/L	8260B
Cyclohexane		0.64	J	1.0	ug/L	8260B
460-48904-20	**EX3-129-CP-00-122712**					
Acetone		9.6		5.0	ug/L	8260B
cis-1,2-Dichloroethene		0.35	J	1.0	ug/L	8260B
1,1,1-Trichloroethane		0.49	J	1.0	ug/L	8260B
Trichloroethene		8.4		1.0	ug/L	8260B
Tetrachloroethene		3.0		1.0	ug/L	8260B
Cyclohexane		0.55	J	1.0	ug/L	8260B
460-48904-21	**EX03-139-CP-00-122712**					
Acetone		10		5.0	ug/L	8260B
cis-1,2-Dichloroethene		0.42	J	1.0	ug/L	8260B
1,1,1-Trichloroethane		0.65	J	1.0	ug/L	8260B
Trichloroethene		12		1.0	ug/L	8260B
Tetrachloroethene		2.2		1.0	ug/L	8260B
Cyclohexane		0.59	J	1.0	ug/L	8260B
460-48904-22	**EX3-155-CP-00-122712**					
Acetone		11		5.0	ug/L	8260B
cis-1,2-Dichloroethene		0.47	J	1.0	ug/L	8260B
1,1,1-Trichloroethane		0.92	J	1.0	ug/L	8260B
Trichloroethene		18		1.0	ug/L	8260B
Tetrachloroethene		3.0		1.0	ug/L	8260B
Cyclohexane		0.53	J	1.0	ug/L	8260B

EXECUTIVE SUMMARY - Detections

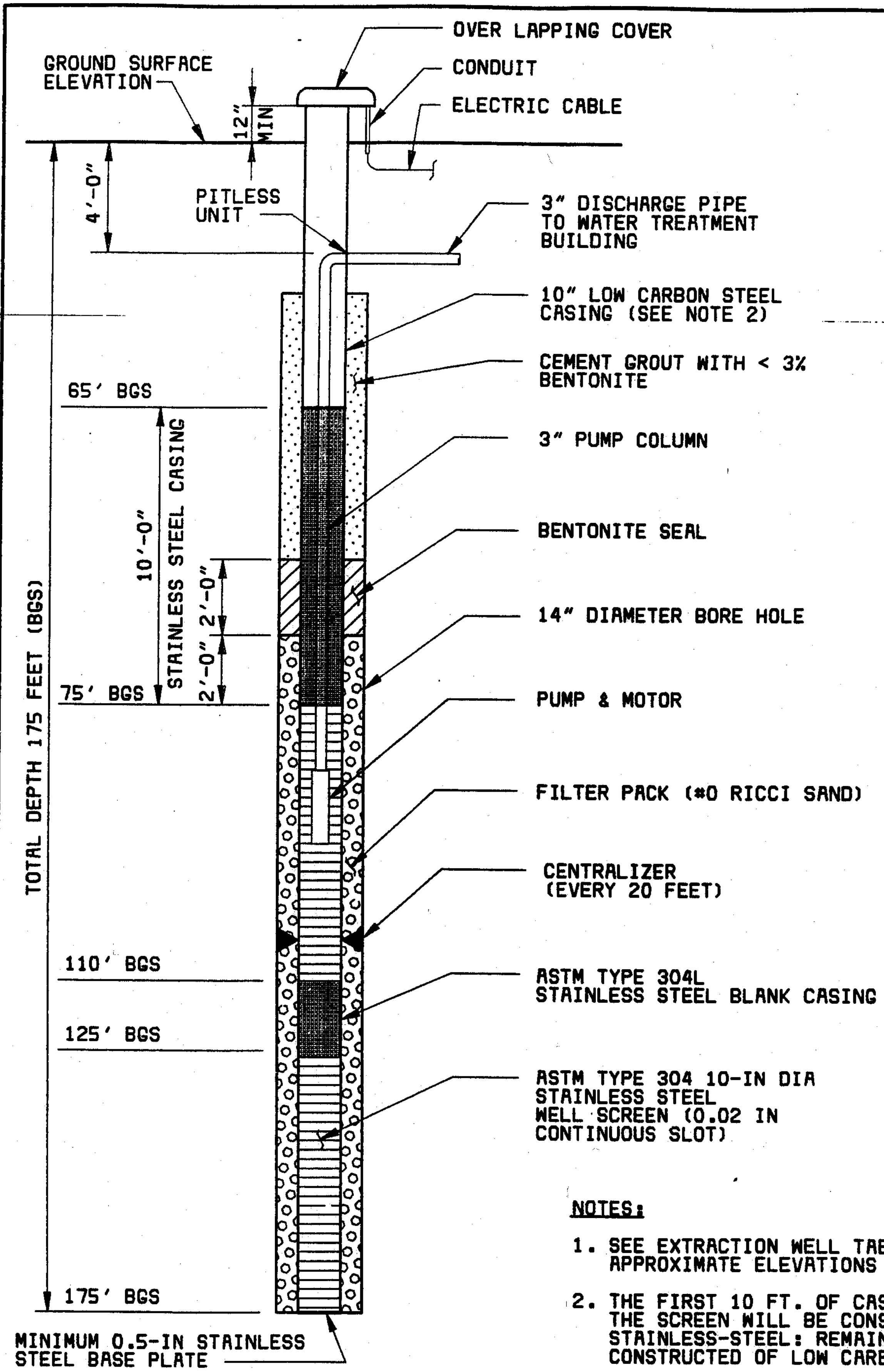
Client: HRP Associates, Inc. Job Number: 460-48904-1

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
460-48904-23	**EX3-165-CP-00-122712**					
Acetone		11		5.0	ug/L	8260B
cis-1,2-Dichloroethene		0.45	J	1.0	ug/L	8260B
1,1,1-Trichloroethane		0.78	J	1.0	ug/L	8260B
Trichloroethene		16		1.0	ug/L	8260B
Tetrachloroethene		2.4		1.0	ug/L	8260B
Cyclohexane		0.52	J	1.0	ug/L	8260B
460-48904-24	**EX3-175-CP-00-122712**					
Acetone		11		5.0	ug/L	8260B
cis-1,2-Dichloroethene		0.57	J	1.0	ug/L	8260B
1,1,1-Trichloroethane		0.88	J	1.0	ug/L	8260B
Trichloroethene		20		1.0	ug/L	8260B
Tetrachloroethene		3.0		1.0	ug/L	8260B
Cyclohexane		0.51	J	1.0	ug/L	8260B
460-48904-25	**EX3-185-CP-00-122712**					
Acetone		10		5.0	ug/L	8260B
cis-1,2-Dichloroethene		0.37	J	1.0	ug/L	8260B
1,1,1-Trichloroethane		0.79	J	1.0	ug/L	8260B
Trichloroethene		17		1.0	ug/L	8260B
Tetrachloroethene		2.3		1.0	ug/L	8260B
Cyclohexane		0.46	J	1.0	ug/L	8260B
460-48904-26	**EX2-181-CP-01-122712**					
Acetone		14		5.0	ug/L	8260B
cis-1,2-Dichloroethene		1.3		1.0	ug/L	8260B
Trichloroethene		2.8		1.0	ug/L	8260B
Tetrachloroethene		1.7		1.0	ug/L	8260B
Cyclohexane		0.31	J	1.0	ug/L	8260B
460-48904-27	**TB-01-CP-QC-122712**					
Chloroform		0.12	J	1.0	ug/L	8260B
Dibromochloromethane		1.5		1.0	ug/L	8260B
Bromoform		1.6		1.0	ug/L	8260B
460-48904-28	**RB-01-CP-QC-122712**					
Chloroform		0.21	J	1.0	ug/L	8260B
Bromodichloromethane		0.63	J	1.0	ug/L	8260B
Dibromochloromethane		1.6		1.0	ug/L	8260B
Bromoform		1.8		1.0	ug/L	8260B

Attachment 2

Drill Logs

08/21/97 14:16:45 ACD-14.



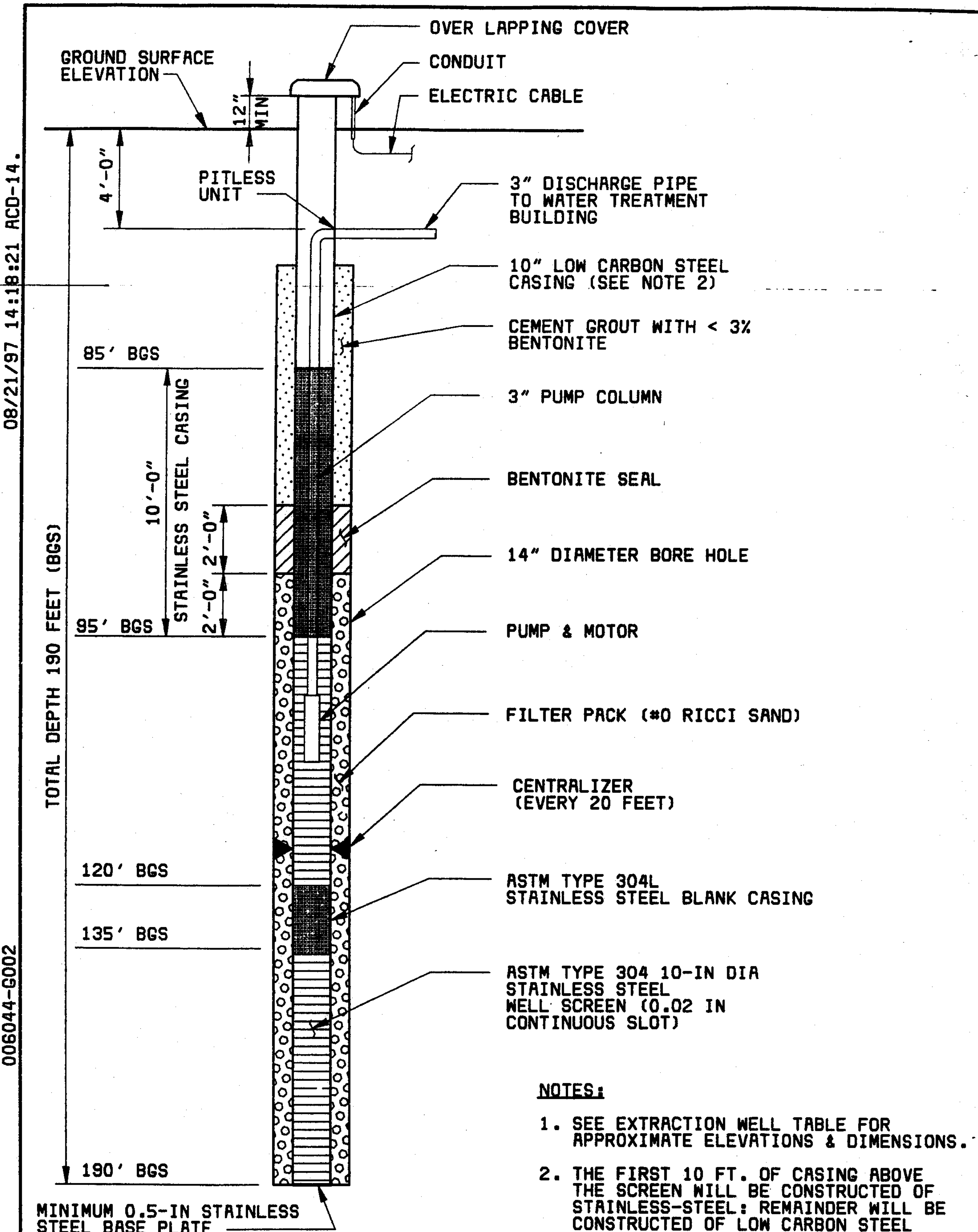
NOTES:

1. SEE EXTRACTION WELL TABLE FOR APPROXIMATE ELEVATIONS & DIMENSIONS.
2. THE FIRST 10 FT. OF CASING ABOVE THE SCREEN WILL BE CONSTRUCTED OF STAINLESS-STEEL; REMAINDER WILL BE CONSTRUCTED OF LOW CARBON STEEL

006044-G001

RADIAN INTERNATIONAL LLC	"EX-1" EXTRACTION WELL CONSTRUCTION		FIGURE 3-2A
	CLAREMONT POLYCHEMICAL	PROJECT NUMBER: 006044	
	SCALE: N.T.S.	DATE: 08/18/97	DELIVERY:

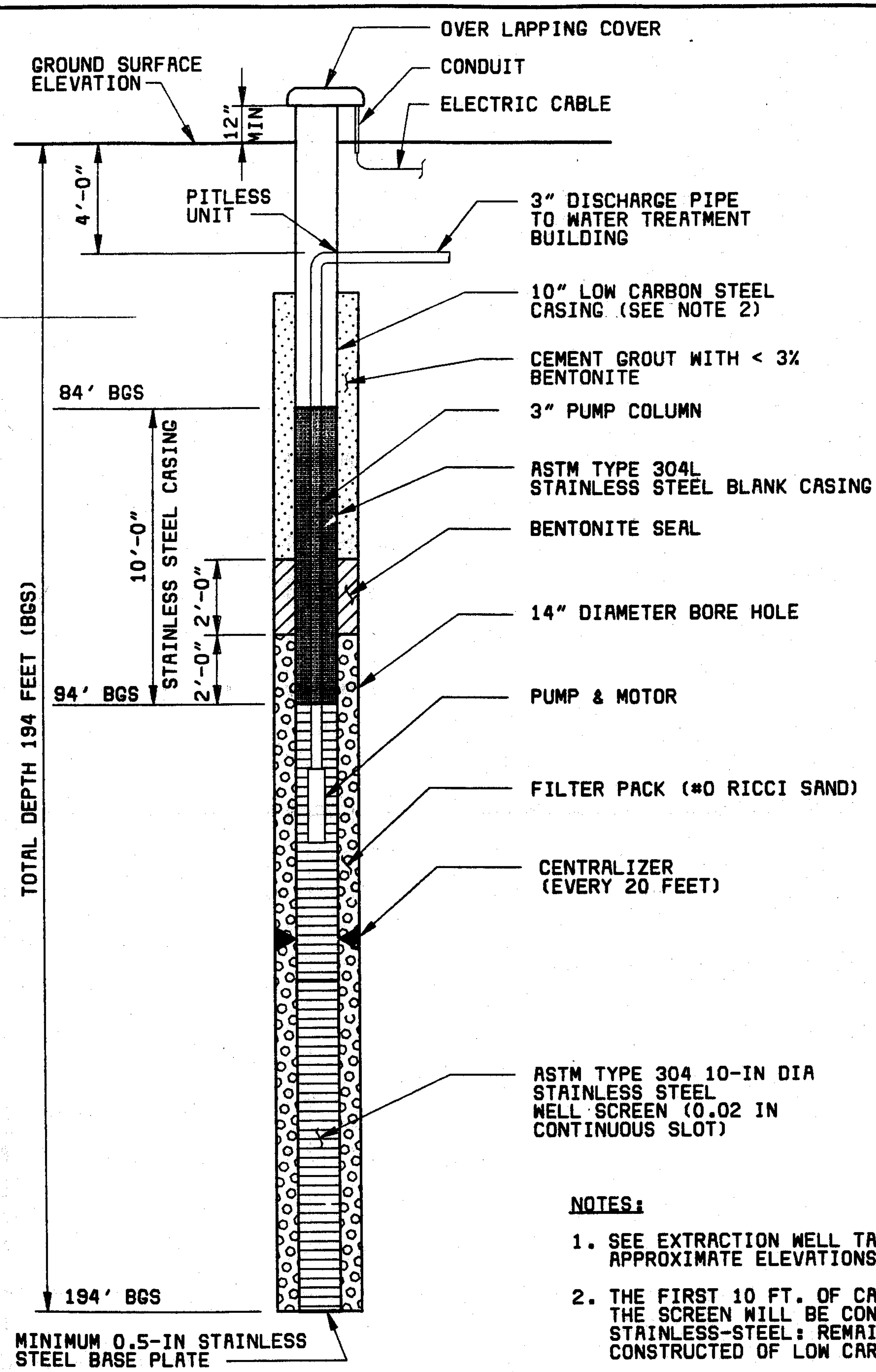
CBA003



NOTES:

1. SEE EXTRACTION WELL TABLE FOR APPROXIMATE ELEVATIONS & DIMENSIONS.
2. THE FIRST 10 FT. OF CASING ABOVE THE SCREEN WILL BE CONSTRUCTED OF STAINLESS-STEEL; REMAINDER WILL BE CONSTRUCTED OF LOW CARBON STEEL

RADIAN INTERNATIONAL LLC	"EX-2" EXTRACTION WELL CONSTRUCTION		FIGURE 3-2B
	CLAREMONT POLYCHEMICAL	PROJECT NUMBER: 006044	
	SCALE: N.T.S.	DATE: 08/18/97	DELIVERY:



NOTES:

1. SEE EXTRACTION WELL TABLE FOR APPROXIMATE ELEVATIONS & DIMENSIONS.
2. THE FIRST 10 FT. OF CASING ABOVE THE SCREEN WILL BE CONSTRUCTED OF STAINLESS-STEEL: REMAINDER WILL BE CONSTRUCTED OF LOW CARBON STEEL

08/21/97 14:20:05 ACD-14.

006044-G003

CBA003

RADIAN INTERNATIONAL LLC

"EX-3" EXTRACTION WELL CONSTRUCTION

CLAREMONT POLYCHEMICAL	PROJECT NUMBER: 006044	
SCALE: N.T.S.	DATE: 08/18/97	DELIVERY:

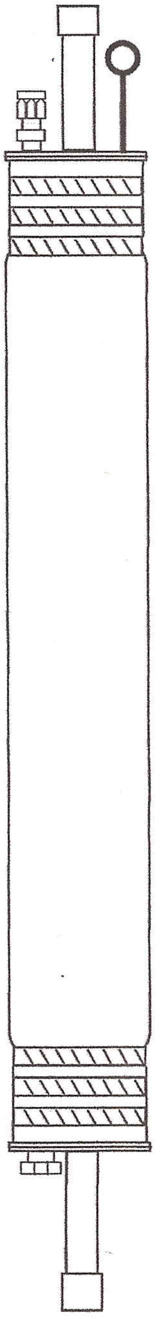
FIGURE 3-2C

Attachment 3

Packer Specifications

Environmental Well Packers

aka Fixed End Packer



APPLICATIONS

> Groundwater monitoring
> Methane gas control or collection in landfills and/or mines
> Monitoring formation pressures
> Vacuum sampling under leachate pads
> Vadose zone sampling and injection

FEATURES

> Constructed of inert materials including Type 304 or Type 316 stainless steel with Neoprene, EPDM, or Viton® rubber gland element
> Can be inflated with either inert gas or water
> Low pressure, fixed-end packer for two-inch or larger size casing
> Can be set at water lever to prevent water intrusion during vacuum sampling
> Can be set up with transducer access tubes or wires
> Can be set up with bladder, electric, piston or airlift sampling pumps to reduce purge time and volume
> Variety of through tubes and threaded end fittings available
> For isolating a specific test zone in a well, multiple packers can be used with a sampling pump
> Custom designed systems for your specific site requirements

ACCESSORIES

> 1/8", 3/16" or 1/4" Nylon inflation tubes
> Stainless steel cable and eye bolts for lowering
> Nitrogen regulators

INSTRUCTIONS TO SET THE PACKER

>>WARNING: Never inflate this packer unless it is confined in a cased well. Maximum internal pressure must not exceed 200 psi.

1. Lower packer into the well and inflate (with either inert gas or water) to the static head above the packer (distance from the packer to the water level x .43).
2. Inflate to 25 psi. This pressure will expand the gland to the well size.
3. Inflate to 20% of the maximum possible differential across the packer.
   Be sure to use an accurate pressure gauge.

Example: The packer is set at 100 feet and the water level is at the top of the well. If you withdraw all the water below the packer, the differential would be 43 psi. In step 3, you would add 9 psi.

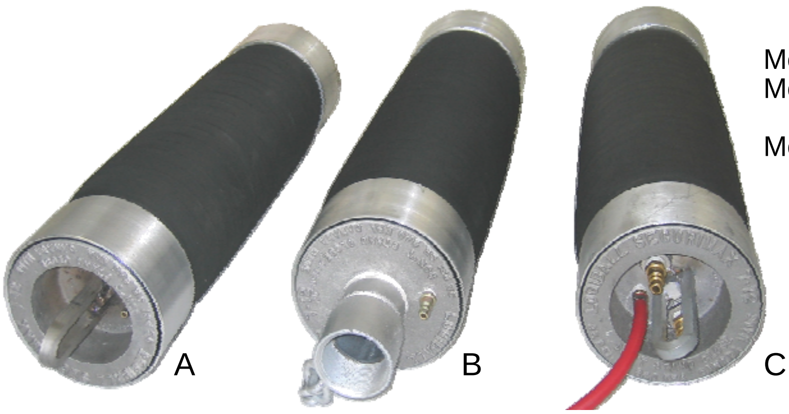
Mark Hartley & Ron Roland, Partners/Owners
Phone: 253-770-0315
Fax: 253-770-0327
Email: info@QSPPackers.com
Web: www.QSPPackers.com

QSP Packers. LLC

LOGIBALL SECURIMAX PLUGS

The SECURIMAX plugs are often referred to as the “Work Horse” plugs. High safety factors such as strong anchoring & end plate retaining devices, premium quality rubber sleeves with two ply cross biased reinforcing cords and manufacturing under strict quality controls have made the Securimax Plugs the field proven choice of professionals for 30 years.

Every plug, identified with a serial number, must pass a severe pressure test and is supplied with a test certificate and a leaflet describing its features and information on its safe use.



Model A: No-flow-thru
Model B: 1/2” flow-thru on the 4-8
2” flow-thru on the 5-10 & up
Model C: Two 1/2” flow-thru hoses

Pipe Size (inches)	Inflation Pressure [1]	Diameter (inches)	Weight (lbs)	Length (inches)	Models Available
4-8	45 psi	3.5	6	17	B
5-10	45 psi	5.0	15	21.5	A, B, C
7-12	35 psi	6.6	26	28.5	A, B, C
9-16	35 psi	8.6	37	30	A, B, C
11-21	35 psi	10.75	50	35.5	A, B, C
13-24	35 psi	12.75	66	39	A, B, C
17-30	25 psi	16.6	160	58	A, B, C
19-36	20 psi	18.75	195	64	A, B, C

1 At these pressures, the plugs will make a tight seal and safely withstand a back pressure of 5 p.s.i. or 12 feet of water in structurally sound and clean pipes.

Eventhough we build our plugs to last a long time, no rubber plug will last forever! Logiball can repair & resleeve all Securimax Plugs.

SERIAL NUMBER: X13111203

LOGIBALL SECURIMAX: 9-16B

INSPECTION REPORT

THE ABOVE PLUG WAS TESTED AND INSPECTED ON: 11 / 13 / 12

TESTED in a 15" pipe AT A PRESSURE OF: 80 P.S.I.

INSPECTION OF ACCESSORIES: ok

LEAK PROOF TEST: ok

INSPECTION OF RUBBER SLEEVE: ok

INFORMATION LEAFLET ENCLOSED: ok

NOTE:

I CERTIFY THAT THE ABOVE PLUG MEETS THE SECURIMAX STANDARDS AND WAS TESTED UNDER A PRESSURE WHICH CREATES STRESSES MORE THAN TWICE AS IMPORTANT AS THE ONES UNDER THE MAXIMUM PIPE SIZE AND INFLATION PRESSURE RECOMMENDED TO THE USERS.

INSPECTOR: GERVAIS VAILLANCOURT

REGISTERED BY: Guy Richard

GUY RICHARD

Logiball inc.

USA: 21 Long Pond Road, Jackman, ME 04945
Tel: (800) 246-5988 Fax: (418) 653-5746
email: logiball@logiball.com

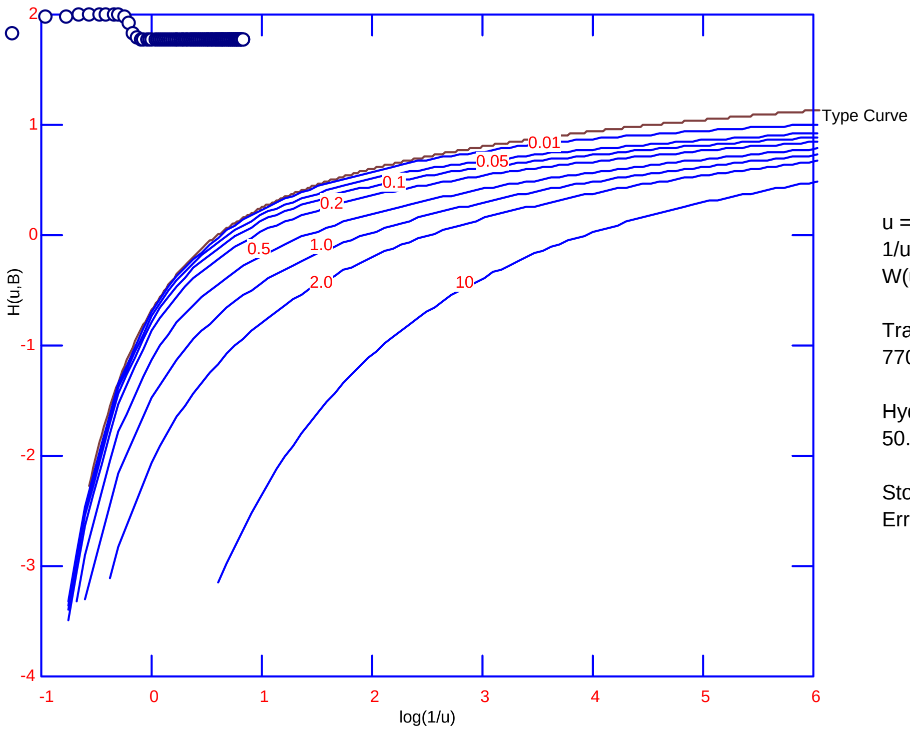
CANADA: 440 Papin, Quebec, QC G1P 3T9
Tel: (418) 656-9767 Fax: (418) 653-5746
email: logiball@logiball.com

Attachment 4

Pump Test Evaluation

Hantush Type Curve EW-1 80 GPM 6/26/2013

Distance to Obs Well:
0. Meters



u = 5.9e-003
1/u = 169.5
W(u) = 19.97

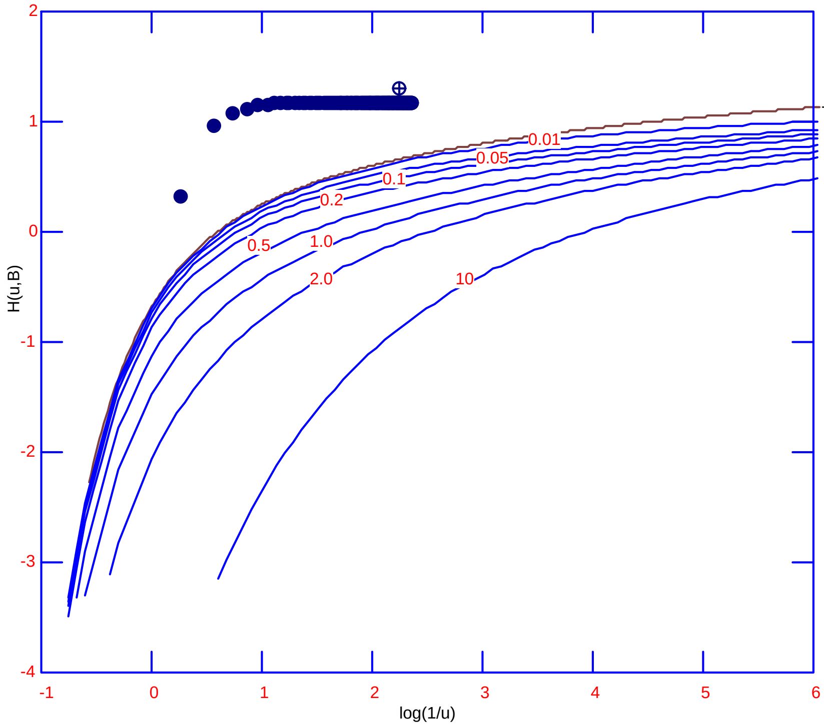
Transmissivity
770.9 m2/day

Hydraulic Conductivity
50.58 meters/day

Storativity
Error: Insufficient Radius Data

EXT-1: Step 1
Analyzed by Starpoint Software

Hantush Type Curve EW-1 110 gpm 6/26/2013



Distance to Obs Well: EW-1
0.1524 Meters

u = 5.9e-003
1/u = 169.5
W(u) = 19.97

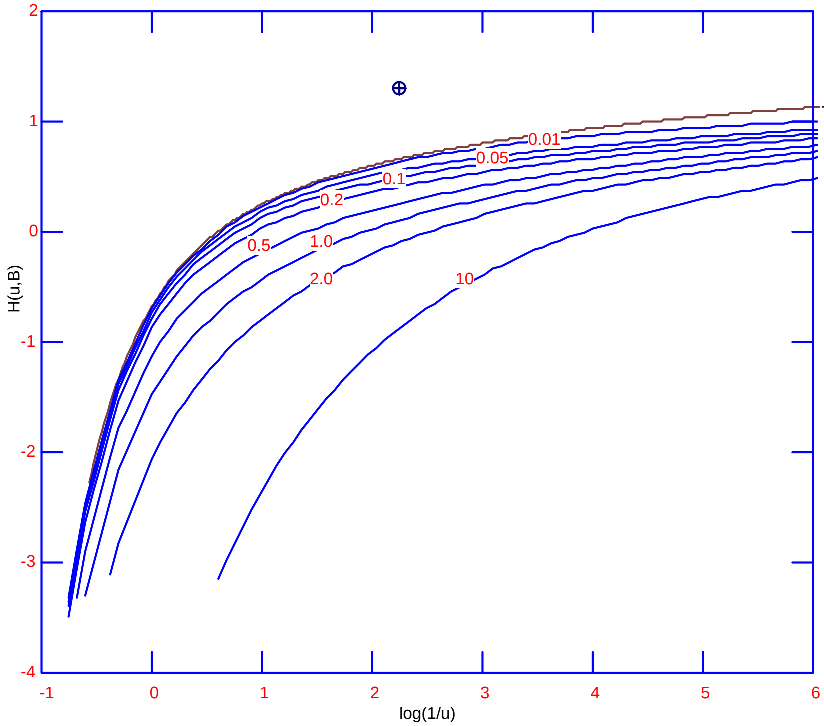
Transmissivity
2827 m2/day

Hydraulic Conductivity
85.66 meters/day

Storativity
2872

Claremont Polychemical Corp. 505 Winding Road, Old Bethpage NY
Project Number: NEW9625.om for NYSDEC
Analyzed by Starpoint Software
EW-1 110 gpm 6/26/2013

Hantush Type Curve EW-1 120 gpm 6/26/2013



Distance to Obs Well: EW-1
0. Meters

u = 5.9e-003
1/u = 169.5
W(u) = 19.97

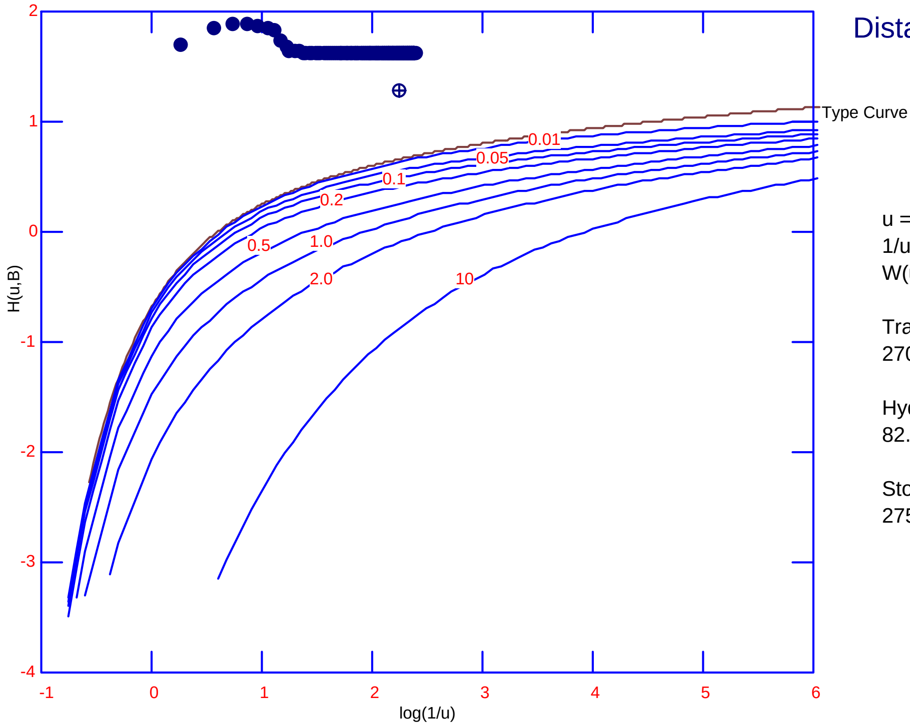
Transmissivity
2827 m2/day

Hydraulic Conductivity
85.66 meters/day

Storativity
Error: Insufficient Radius Data

Claremont Polychemical Corp. 505 Winding Road, Old Bethpage NY
Project Number: NEW9625.om for NYSDEC
Analyzed by Starpoint Software
EW-1 120 gpm 6/26/2013

Hantush Type Curve EW-2 80 gpm 6/26/2013



Distance to Obs Well: EW-2
0.1524 Meters

u = 5.9e-003
1/u = 169.5
W(u) = 19.13

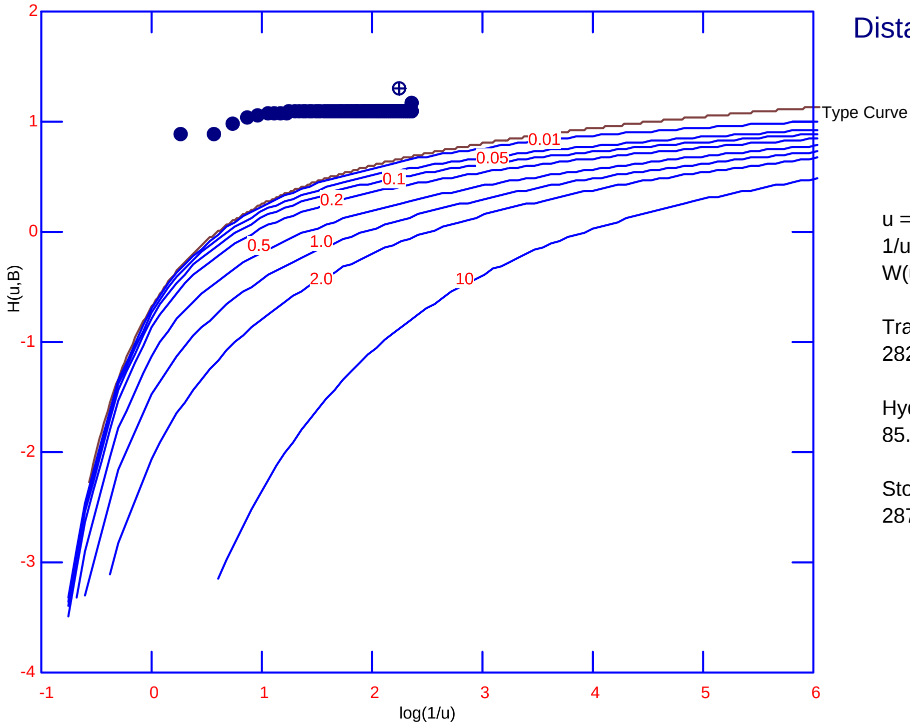
Transmissivity
2708 m2/day

Hydraulic Conductivity
82.07 meters/day

Storativity
2752

Claremont Polychemical Corp. 505 Winding Road, Old Bethpage NY
Project Number: NEW9625.om for NYSDEC
Analyzed by Starpoint Software
EW-2 80 gpm 6/26/2013

Hantush Type Curve EW-2 95 gpm 6/27/2013



Distance to Obs Well: EW-2
0.1524 Meters

u = 5.9e-003
1/u = 169.5
W(u) = 19.97

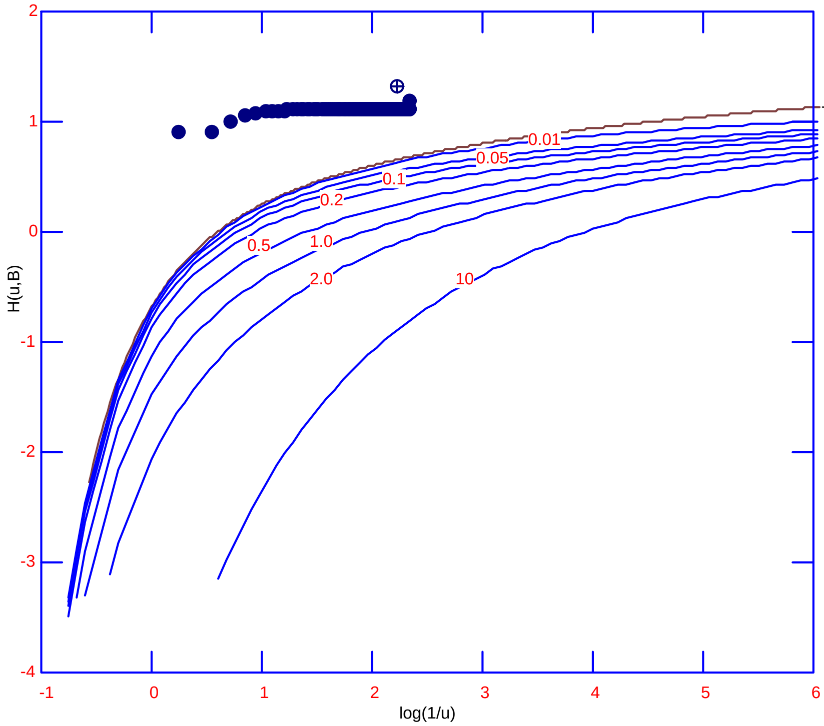
Transmissivity
2827 m2/day

Hydraulic Conductivity
85.66 meters/day

Storativity
2872

Claremont Polychemical Corp. 505 Winding Road, Old Bethpage NY
Project Number: NEW9625.om for NYSDEC
Analyzed by Starpoint Software
EW-2 95 gpm 6/27/2013

Hantush Type Curve EW-2 110 gpm 6/27/2013



Distance to Obs Well: EW-2
0.1524 Meters

u = 6.158e-003
1/u = 162.4
W(u) = 20.84

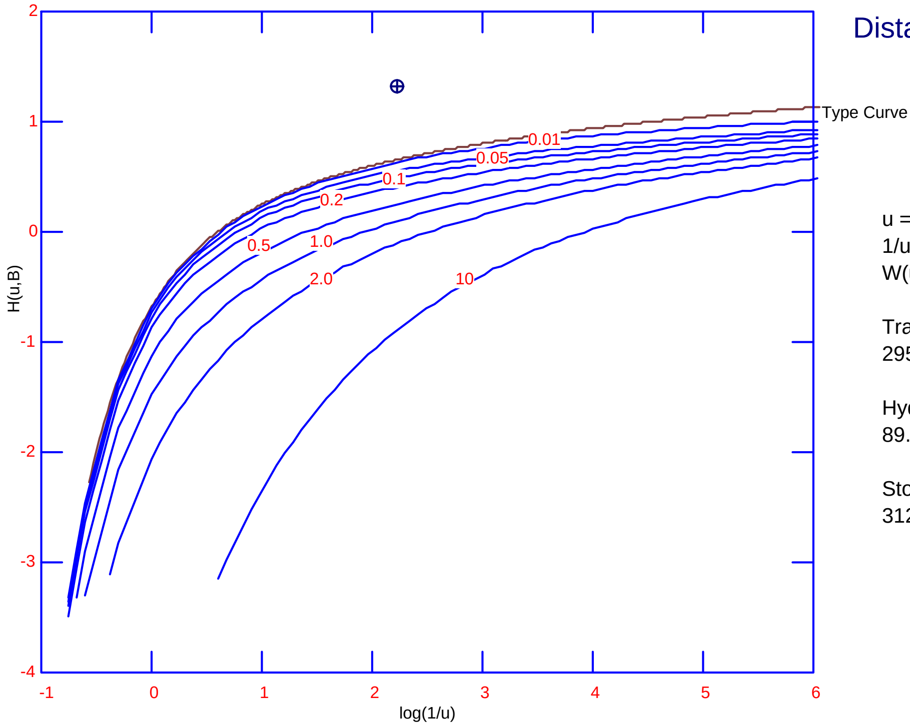
Transmissivity
2950 m2/day

Hydraulic Conductivity
89.4 meters/day

Storativity
3129

Claremont Polychemical Corp. 505 Winding Road, Old Bethpage NY
Project Number: NEW9625.om for NYSDEC
Analyzed by Starpoint Software
EW-2 110 gpm 6/27/2013

Hantush Type Curve EW-2 120 gpm 6/27/2013



Distance to Obs Well: EW-2
0.1524 Meters

u = 6.158e-003
1/u = 162.4
W(u) = 20.84

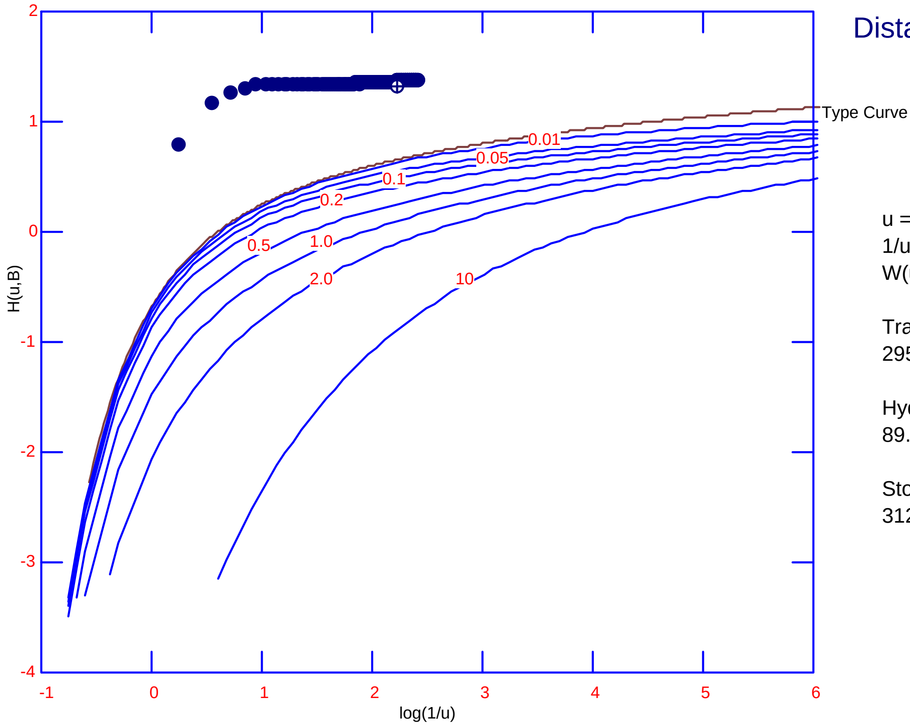
Transmissivity
2950 m2/day

Hydraulic Conductivity
89.4 meters/day

Storativity
3129

Claremont Polychemical Corp. 505 Winding Road, Old Bethpage NY
Project Number: NEW9625.om for NYSDEC
Analyzed by Starpoint Software
EW-2 120 gpm 6/27/2013

Hantush Type Curve EW-2 135 gpm 6/27/2013



Distance to Obs Well: EW-2
0.1524 Meters

u = 6.158e-003
1/u = 162.4
W(u) = 20.84

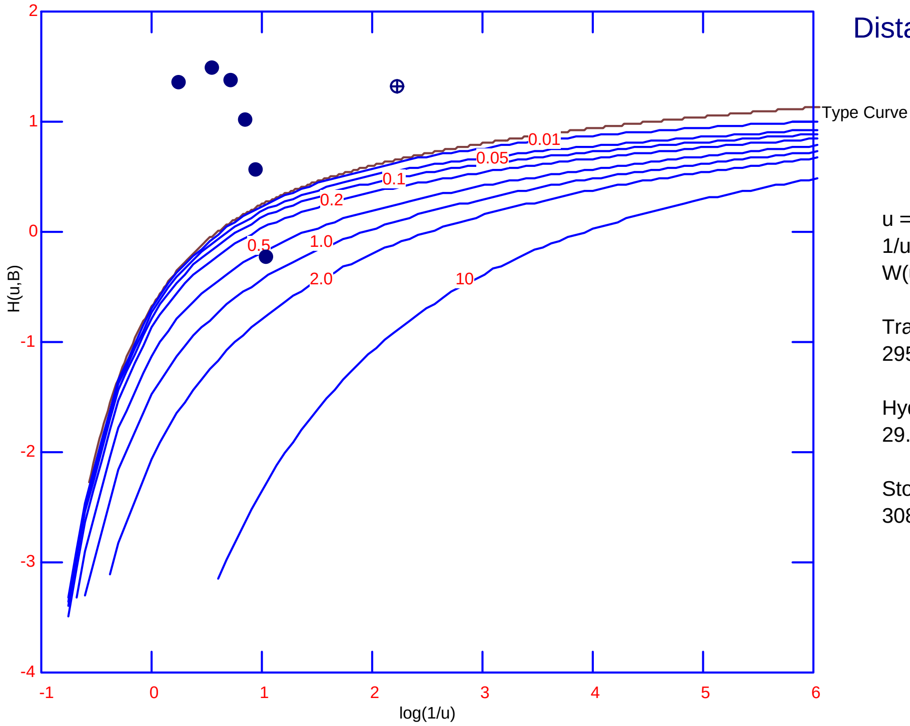
Transmissivity
2950 m2/day

Hydraulic Conductivity
89.4 meters/day

Storativity
3129

Claremont Polychemical Corp. 505 Winding Road, Old Bethpage NY
Project Number: NEW9625.om for NYSDEC
Analyzed by Starpoint Software
EW-2 135 gpm 6/27/2013

Hantush Type Curve EW-3 80 gpm 6/27/2013



Distance to Obs Well: EW-3
0.1534 Meters

u = 6.158e-003
1/u = 162.4
W(u) = 20.84

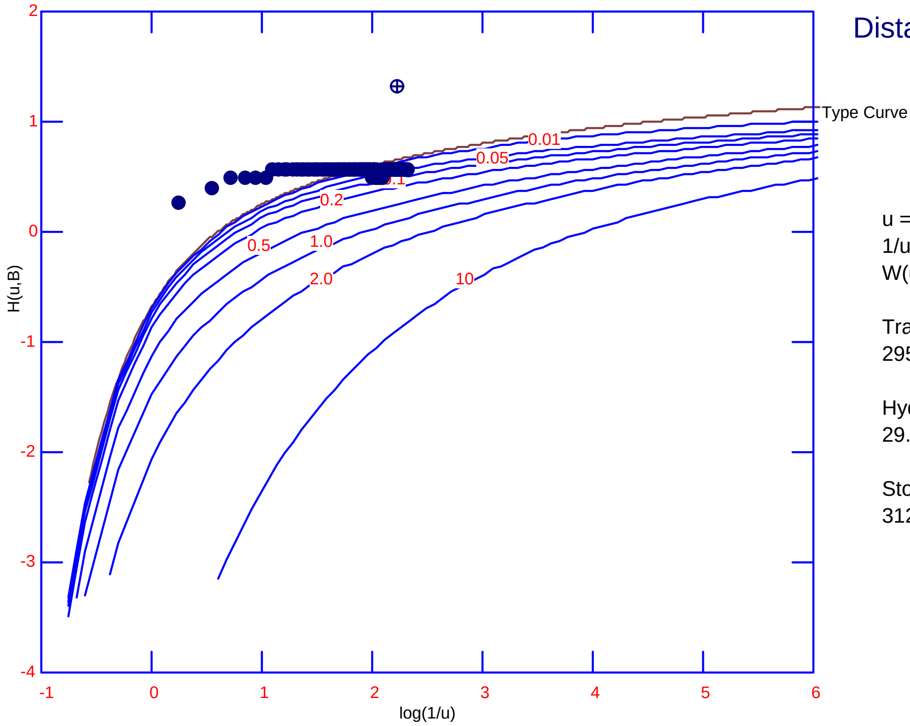
Transmissivity
2950 m2/day

Hydraulic Conductivity
29.5 meters/day

Storativity
3088

Claremont Polychemical Corp. 505 Winding Road, Old Bethpage NY
Project Number: NEW9625.om for NYSDEC
Analyzed by Starpoint Software
EW-3 80 gpm 6/27/2013

Hantush Type Curve EW-3 95 gpm 6/27/2013



Distance to Obs Well: EW-3
0.1524 Meters

u = 6.158e-003
1/u = 162.4
W(u) = 20.84

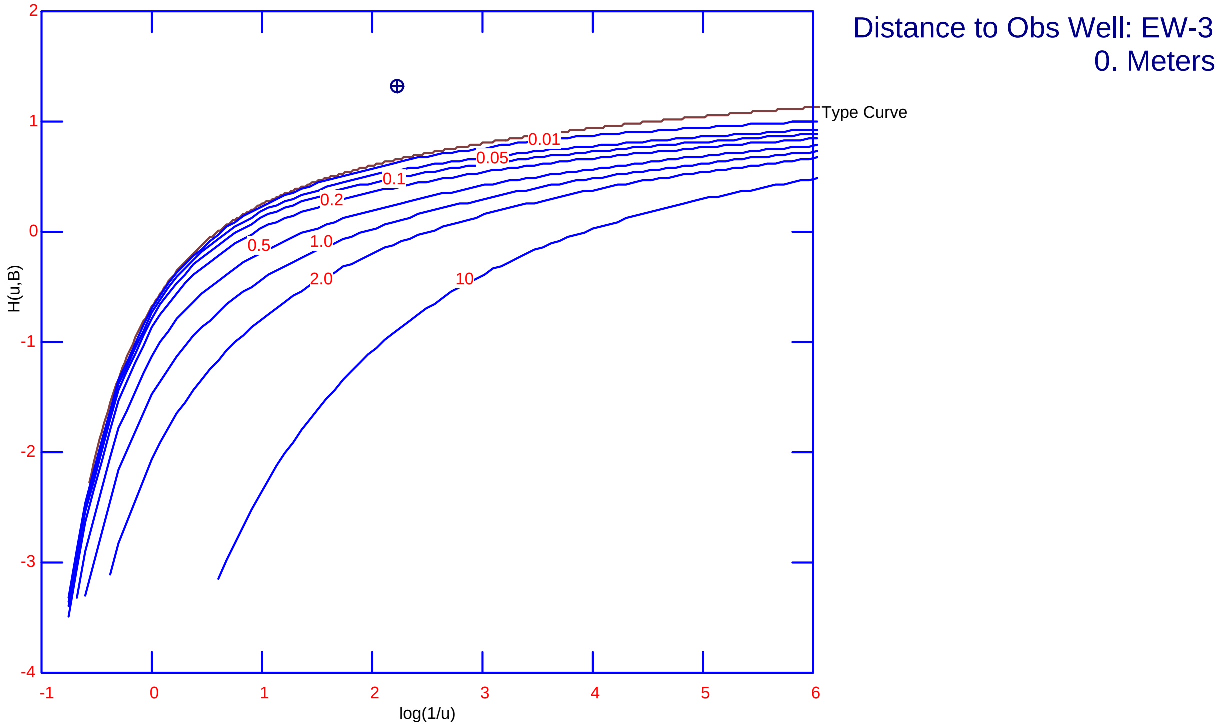
Transmissivity
2950 m2/day

Hydraulic Conductivity
29.5 meters/day

Storativity
3129

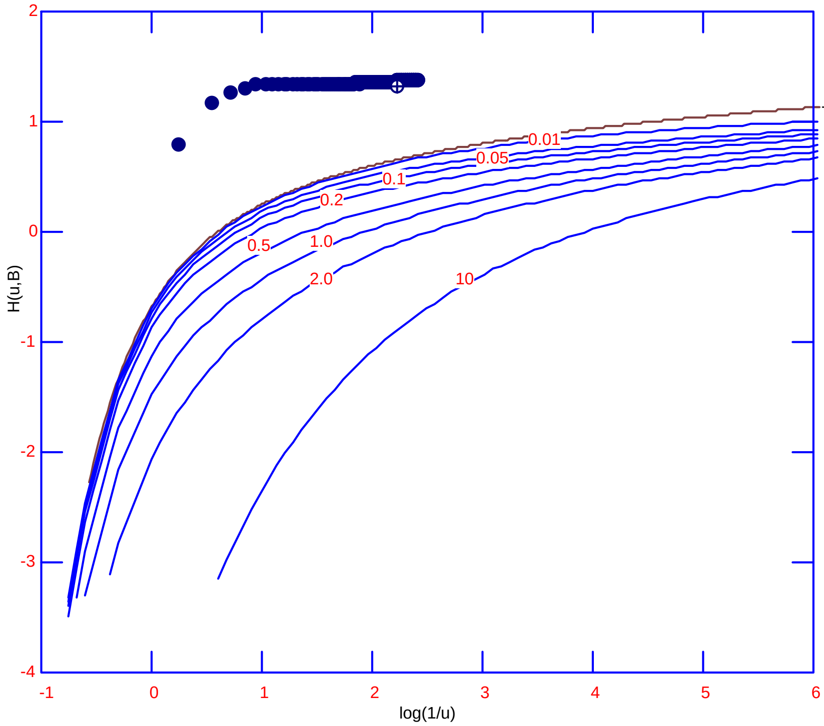
Claremont Polychemical Corp. 505 Winding Road, Old Bethpage NY
Project Number: NEW9625.om for NYSDEC
Analyzed by Starpoint Software
EW-3 95 gpm 6/27/2013

Hantush Type Curve EW-3 110 gpm 6/27/2013



Claremont Polychemical Corp. 505 Winding Road, Old Bethpage NY
Project Number: NEW9625.om for NYSDEC
Analyzed by Starpoint Software
EW-3 110 gpm 6/27/2013

Hantush Type Curve EW-3 120 gpm 6/27/2013



Distance to Obs Well: EW-3
0.1524 Meters

u = 6.158e-003
1/u = 162.4
W(u) = 20.84

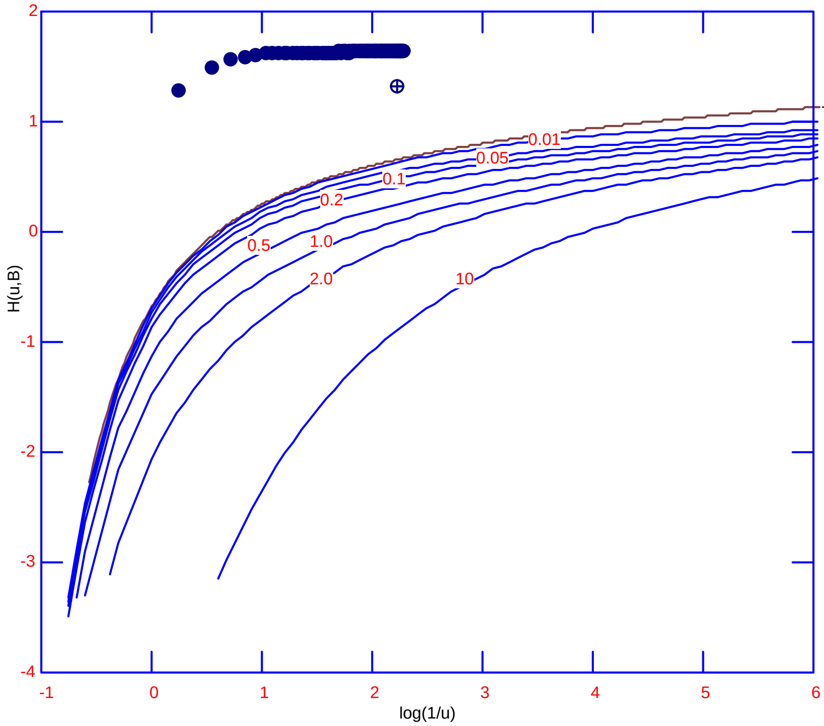
Transmissivity
2950 m2/day

Hydraulic Conductivity
29.5 meters/day

Storativity
3129

Claremont Polychemical Corp. 505 Winding Road, Old Bethpage NY
Project Number: NEW9625.om for NYSDEC
Analyzed by Starpoint Software
EW-3 120 gpm 6/27/2013

Hantush Type Curve EW-3 135 gpm 6/27/2013



Distance to Obs Well: EW-3
0. Meters

u = 6.158e-003
1/u = 162.4
W(u) = 20.84

Transmissivity
2950 m2/day

Hydraulic Conductivity
29.5 meters/day

Storativity
Error: Insufficient Radius Data

Claremont Polychemical Corp. 505 Winding Road, Old Bethpage NY
Project Number: NEW9625.om for NYSDEC
Analyzed by Starpoint Software
EW-3 135 gpm 6/27/2013