AS-BUILT REPORT
COVER, EROSION, AND REVEGETATION
TEST PLOT STUDY

TYRONE MINE STOCKPILES

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1.0 INTRODUCTION

Phelps Dodge Tyrone Inc. (Tyrone) operates an open-pit copper mine near Silver City, New Mexico (Figure 1). Tyrone is engaged in mine reclamation and closure activities on selected facilities with the intent of meeting pertinent applicable requirements of the New Mexico Water Quality Control Act (WQA), the Water Quality Control Commission (WQCC) Regulations, and the New Mexico Mining Act (NMMA). The New Mexico Mining and Minerals Division (MMD) regulates Tyrone as an existing mine under Permit No. GR010RE. The New Mexico Environment Department (NMED) issued Discharge Permit 1341 (DP-1341) to Tyrone to regulate closure related activities.

Condition 76 (DP-1341) requires the development and interpretation of cover, erosion, and revegetation test plots. The purpose of the test plots is to "evaluate: net infiltration [drainage] through the store and release cover with differing cover thicknesses; feasibility of construction and construction techniques required during cover placement; erosion rates of covered and uncovered slopes; vegetation success; and the potential for upward migration of acidic solutions from the Tailing Impoundments, Waste Rock Piles and Leach Ore Stockpiles".

1.1 Background

The cover design for the Tyrone Stockpiles is part of a reclamation plan that includes complementary surface and subsurface water control measures and water treatment. Tyrone identified the cover design study as one of several studies supporting the closure/closeout plan (DBS&A, 1997). Through meetings and discussions with the NMED and the MMD during the spring of 1998, Tyrone prepared and submitted a cover design work plan for regulatory review on August 3, 1998. Based upon agency comments, Tyrone submitted a revised work plan on October 23, 1998 and began work on the cover design study in early November 1998.

Implementation of the initial work plan and subsequent work led to the development of the Cover Design Study Status Report (CDSSR) for Tyrone (DBS&A, 1999). The CDSSR presented the results of the materials characterization, soil water balance simulations, and technical reviews of various types of cover systems. Based on this work and subsequent interactions with the NMED and MMD, a store and release cover was selected as the most appropriate for use at Tyrone.

Tyrone submitted a work plan to address Condition 76 in December 2003 (Tetra Tech, 2003). The original designs called for 2.5:1, 3:1, and top surface plots to be constructed with Gila Conglomerate covers on the south side of the No. 1 Stockpile and 2:1 test plots to be built on the No. 1C Stockpile.

Ultimately, alternative designs for reclamation of the No. 1C Stockpile resulted in the abandonment of the 2:1 Gila Conglomerate test plots, and the No. 1 Stockpile test plots were relocated to the west face of the stockpile (Figure 2). The NMED conditionally approved the Tyrone Stockpile Test Plot work plan on February 17, 2005. The MMD officially approved the test plot work plan including provisions associated with compliance with Condition 9.L.1 (Permit GR010RE) in February 2006.

1.2 Test Plots Goals and Objectives

The primary goal of the vadose zone monitoring program is to calibrate the existing soil water balance models (UNSAT-H) for the Chino and Tyrone mines to predict long-term performance of the covers based on the data collected during the cover performance period (Tetra Tech, 2003). Ultimately, modeling is necessary to accommodate the natural variations in climate that characterize this region. The primary objectives proposed as part of the cover, erosion, and revegetation test plot study include the following:

- Determine if the covers described in Supplemental Discharge Plan DP-1341 and/or alternative cover systems will ensure that the requirements of the WQA and WQCC Regulations are met;
- Evaluate infiltration beneath the various cover systems;
- Evaluate the feasibility of limiting infiltration beneath the covers to less than one percent of the mean annual precipitation;
- Evaluate the constructability of cover systems of variable thicknesses on slopes with a range of gradients;
- Calibrate the existing water balance model with data obtained as part of this study and in coordination with other pertinent permit conditions; and
- Verify field performance of the proposed and alternate covers.

1.3 As-Built Report

The various MMD and NMED permit conditions require that Tyrone provide as-built information within 90 days of the completion of the test plots. The test plots are substantively complete from an earthmoving and revegetation perspective, although additional work is required to finalize the test plots. Outstanding issues related to completion of the test plots are discussed at the end of this report.

The intent of this report is to document:

- final configuration of the test plots
- baseline cover and waste rock characterization
- vadose zone monitoring instrument installation, testing, and calibration;
- lysimeter materials, construction, and testing results;
- seed mixture and seeding rates; and
- meteorological station instrumentation testing and calibration.

This report also includes as-built diagrams of the test plots including location, number designation, and size. The actual cover thickness data generated from the sampling of five excavations is included in this report as well as information on borrow sources. Major deviations from the work plans are discussed in appropriate sections of the report. Costs associated with construction of the test plots will be presented once the test plots are finalized and costs are tabulated by Tyrone.

2.0 MATERIALS CHARACTERIZATION

The cover and underlying materials in the test plots were sampled and analyzed to establish a physiochemical baseline for each site. The field and laboratory characterization methods are discussed in Section 2.1. The results of the physical and chemical characterizations are discussed in Sections 2.2, and the hydraulic data are presented in Section 2.3.

2.1 Characterization Methods

2.1.1 Field Methods

Individual waste rock and cover samples were collected for physical and chemical analysis of the fine-earth fraction (particles < 2mm in diameter). The fine-earth samples were 5 to 10 kg in size and the larger rock fragments (> 75 mm) were removed. The samples collected for particle size analyses were placed directly in gallon-size plastic bags, while the samples for soil-hydraulic analyses were placed in 5-gallon airtight plastic buckets. The samples were shipped to the associated analytical laboratories at ambient temperature.

Waste rock samples were collected prior to cover placement. Bulk waste rock samples were collected from the upper two feet of the regraded surface and from various depths near the instrument nests for laboratory analysis.

Following cover placement but before seeding, 5 test pits were excavated in the cover in each plot. The entire interval of the exposed profile was described (Soil Survey Division Staff, 1993). The pits were examined with emphasis on determining the spatial and volumetric relationships of the fine-earth and rock fragments. Cover thickness was determined by examining the exposed faces of the pits. Cover material samples were collected from the test pits (5 pits per test plot), and used to determine the final cover thickness; one sample was collected from the surface to a depth of one foot; and the second sample was collected from the one-foot interval above the basal contact with the waste rock.

2.1.2 Chemical and Physical Analysis Methods

The chemical and physical analyses were conducted at Energy Laboratories in Billings, Montana. A total of 40 waste rock and 84 cover samples were collected for chemical and physical analyses. The individual sample locations are presented in Figure 3. The bulk samples were air-dried and passed through a 2 mm sieve at the laboratory. The less than 2 mm soil fraction of the cover materials was analyzed for the parameters listed in Table 1. Similar test were made on the waste rock, except that nitrogen,

phosphorous, and organic carbon were not determined. These analyses were conducted using standard methods that are consistent with the 1996 MMD Draft Closeout Plan Guidelines (MMD, 1996).

2.1.3 Soil Hydraulic Characterization Methods

The goal of the soil hydraulic analyses was to develop an understanding of the range of hydraulic properties of the materials. A total of 8 waste rock and 7 cover samples were collected for soil hydraulic analyses (Figure 3). The samples were analyzed at the Daniel B. Stephens & Associates (DBS&A) Laboratory in Albuquerque, New Mexico. Because the waste rock and cover materials contain rock fragments, the soil-hydraulic analyses were conducted on the less than 2 mm fraction. The fine-earth fraction of the samples was packed to specified bulk densities based on well established soil textural relationships (Soil Survey Division Staff, 1993). The soil hydraulic testing methods are summarized in Table 2.

2.2 Chemical and Physical Characteristics

2.2.1 Cover

Cover materials were derived from a borrow area established for the test plot program (Figure 2). Field descriptions of the cover materials are summarized in Table 3. The chemical and physical properties of the cover materials are summarized in Table 4; the laboratory data are included in Appendix A. The cover materials are moderately-coarse textured, represented mainly by sandy loams and sandy clay loams. The cover samples contain moderate amounts rock fragments (Tables 3 and 4). The majority of the samples were circumneutral ranging from slightly acid to moderately alkaline (pH 6.0 to 7.9). One sample was strongly acid with a pH of 4.8. The cover materials were non- to slightly saline (0.4 to 3.3 deciSiemens per meter [dS/m]) and generally lacked $CaCO_3$. The organic matter, phosphorous, and nitrate contents are relatively low.

2.2.2 Waste Rock

The chemical and physical properties of the waste rock are summarized in Table 5; the laboratory reports are in Appendix B. The characteristics of the waste rock samples were fairly consistent (Table 5). The samples were mainly classified as sandy clay loams and loams with 20 to 27 percent clay. All the samples were extremely acid (pH 2.0 to 3.4) and ranged from slightly- to moderately-saline (5.3 to 11.4 dS/m).

2.3 Soil Hydraulic Characteristics

The soil hydraulic characterization was meant to provide site-specific information as well as to complement the existing database for the Gila Conglomerate at Tyrone (DBS&A, 1999; Golder, 2005). The hydraulic characterization data for the cover materials are summarized in Table 6; the laboratory reports are included in Appendix C. The hydraulic characterization data for the waste rock are summarized in Table 7; the laboratory reports are included in Appendix D. Pertinent data in Tables 6 and 7 were corrected to account for rock fragments contained in the samples submitted to the laboratory; however, it should be noted that the samples were not fully reflective of the field conditions with respect to rock fragments.

3.0 TEST PLOT DESIGN AND CONSTRUCTION

The stockpile test plots were constructed using equipment and techniques representative of the methods that will be applied in the normal course of reclamation at Tyrone. Section 3.1 provides an overview of the construction practices that were applied at the stockpile test plots. The final configuration of the test plots is represented in Section 3.2. Section 3.3 details the calibration and installation of the vadose zone monitoring instruments, including the volumetric lysimeters. The erosion monitoring equipment is detailed in Section 3.4. Finally, Section 3.5 discusses cost information pertinent to the test plots.

3.1 Construction Methods

3.1.1 Subgrade Preparation

The west slope of the No. 1 Stockpile was regraded using a push-down technique to construct the slopes and a wide bench to represent a top surface. The regrading operation was primarily performed with D8R and D11 dozers to build the 2.5:1 and 3:1 slopes. The ultimate configuration of the top surface plot was different than the 2005 preliminary design. The top surface plot was smaller than the original design to accommodate the mass balance of materials from the 3:1 slope and still avoid the power lines at the base of the 2.5:1 slope. The computer aided earthmoving system (CAES) was used to assist in grade control and equipment operations. This process was complemented by conventional GPS surveys.

3.1.2 Drainage Control

A surface drainage channel was constructed at the base of the 3:1 test plots to prevent runon to the top surface plots. The trench was pre-excavated in the stockpile along the centerline of the ditch using an excavator and the trench was backfilled with 3 feet of local borrow materials. Rip rap from the Wind Canyon quarry was placed in the northern section of the channel and Copper Mountain leach cap rip rap was placed in the southern section of the channel. Berms were constructed on the northern, southern, and eastern perimeters to prevent runon from the adjacent uncovered stockpile materials.

3.1.3 Cover Placement

The cover materials were obtained from a local borrow area developed specifically for the test plots. The borrow area was located northeast of the stockpile as shown on Figure 2. The cover materials were spread using either 631 scrapers or staged at the crest and pushed down the slopes using dozers. The final grade on the cover was achieved using a motor grader or dozer equipped with CAES.

Cover thickness was initially assessed by excavating pits and measuring cover thickness during the quality control process. Areas with overbuilt or underbuilt covers were graded to achieve the design thickness. The locations of the 5 cover thickness confirmation test pits required by the MMD are shown on Figure 3. The cover thickness for each test pit is listed in Table 3. Figures 4 through 6 illustrate the mean cover thickness for the test plots. The thickness data indicate that the mean cover thickness treatments are statistically different with 95 percent confidence.

3.1.4 Revegetation

The test plots were revegetated in a manner consistent with requirements of Appendix C of Permit GR010RE. The revegetation operations were performed by Rocky Mountain Reclamation in early August 2005. Operationally, the revegetation procedures included: 1) scarification and seedbed preparation, 2) seeding, and 3) mulching and crimping. Pertinent details of these operations are discussed below.

3.1.4.1 Seedbed Preparation

During the seeding operation, Rocky Mountain Reclamation scarified to a depth of 8 to 12 inches using tractor mounted steel shanks. These scarification procedures were performed on the contour.

3.1.4.2 Seeding

The seed was drilled and broadcast simultaneously using a modified rangeland drill with depth control bands, packer wheels, agitators and augers, and picker wheels. The light and fluffy seeds were allowed to fall freely behind the drill and were covered using chain drags pulled behind the drill. Compact seeds were drilled to promote proper seed placement. Seeding on the No. 1 Stockpile test plots was completed by the second week in August 2005.

3.1.4.3 Seed Mix

The seed mix applied on the stockpile test plots is listed in Table 8. Seed was procured by Rocky Mountain Reclamation from Granite Seed Company. The seed mix deviated slightly from the primary seed mix (Appendix C of Permit GR010RE) to accommodate requests from the New Mexico Game and Fish Department and the MMD, and because seed availability issues.

3.1.4.4 Mulching and Crimping

Certified weed-free, long-stem, native hay was supplied by Rocky Mountain Reclamation and used to mulch the test plots. The mulch was delivered in cylindrical bales originating from Kansas and Oklahoma. Specially-adapted mulch-spreading equipment pulled behind a 4-wheel drive tractor was used to uniformly spread the mulch at the rate of about 2.0 tons per acre. The mulch was then crimped 3 to 4 inches into the cover using a disc harrow with straight coulter discs spaced approximately 6 to 8 inches apart. The crimping operation was performed on the contour on the 3:1 and top surface test plots. On the 2.5:1 plots, the mulch was not crimped because the equipment was unable to stay on the contour.

3.1.4.5 Chemical Amendments

No chemical amendments were applied to the test plots. Fertilization of a portion of the test plots was proposed in the work plan and this oversight by Golder represents a data gap in the completion of the test plots. A schedule for rectifying this oversight is presented in Section 4.0.

3.2 Test Plot Configurations

Test plots were constructed on the No. 1 Stockpile at the Tyrone Mine in accordance with Condition 76 of DP-1341. A total of 9 large-scale test plots representing different cover thickness treatments (2, 3, and 4 feet) and slopes angles of 2.5:1, 3:1, and nearly level (top surface) were built to emulate the expected construction operations of a full-scale reclamation effort. Plate 1 illustrates the final configuration of the stockpile test plots.

The test plots were constructed on the west face of the No. 1 Stockpile consistent with the design submitted in January 2005. The test plots ranged from 0.96 to 1.8 acres and total about 12 acres. As indicated earlier, the top surface plots are smaller than the original design to accommodate the mass balance of materials from the 3:1 slope and still avoid the power lines at the base of the 2.5:1 slope. Furthermore, because the No. 1 Stockpile is now scheduled for full closure, the angle-of-repose and top surface control plots were not established. An alternative location for the control plots is being evaluated by Tyrone.

Top surface slope gradients averaged 2.5 percent and slope length averaged about 180 feet in length. Slope lengths and gradients for the slope plots generally conformed to the permit requirements: the 2.5:1 slopes are about 175 feet long and the 3:1 slopes have 300-foot slope lengths (Plate 1).

3.3 Vadose Zone Monitoring Instrumentation

Numerous types of instrumentation are commercially available to measure in-situ soil water content, and matric potential. The relative advantages and limitations of soil water potential and water content measuring devices were discussed in the original work plan (Tetra Tech, 2003) and subsequent correspondence. The vadose zone monitoring system installed at the No. 1 Stockpile test plots was designed to evaluate the performance and applicability of instrumentation in measuring soil matric potentials, soil water contents, soil temperatures, and fluid levels in the lysimeter reservoirs with the ultimate objective of evaluating drainage from reclaimed stockpiles. Three replicate vadose zone monitoring nests were installed on the primary test plots, which included the 2- and 4-foot cover thickness treatments for the stockpile top surface test plots. As requested by the NMED, single monitoring nests were installed in the remaining test plots. The vadose zone instruments are all connected to data loggers, which allow for continuous monitoring and storage of data from the various instruments.

Data stored on the loggers are currently being downloaded on a weekly basis and then incorporated into a master database. The vadose-zone monitoring network will be monitored with the automated systems for a period of at least seven years. Volumetric drainage lysimeters were also installed in the 2- and 4-foot cover treatment top surface test plots and the 3-foot cover treatment on the 3:1 slope test plot to accommodate a request from the NMED. The specific number, type, and placement of instruments in the nests are listed in Table 9. The vadose zone monitoring systems for the individual test plots include instrumentation nests consisting of a combination of heat dissipations sensors (HDS) and gypsum blocks (electrical resistance sensors [ERS]) for estimating soil matric potentials, frequency domain reflectometers (FDR) sensors for estimating water content within the cover materials and underlying waste materials. Pressure transducers were installed to measure fluid levels in the lysimeter reservoirs. The HDS also provide measurements of soil temperatures within the covers and underlying waste materials.

3.3.1 Calibration

Soil matric potential is required to determine both the gradient and direction of soil-water movement within the vadose zone. There are a variety of commercially available instruments for measuring soil matric potential, including tensiometers, psychrometers, ERSs, and HDSs. With the exception of tensiometers, all of these instruments measure some geophysical property that is related to the soil water or matric potential through a calibration curve. As such, it is imperative that the instruments selected for monitoring the test plots be carefully calibrated. The development of water retention characteristics for the heat dissipation sensors and test plot materials along with calibration of the FDR sensors to the site

materials will allow for more accurate measurement of the soil water content and matric potential within the test plots.

The HDS were calibrated in the laboratory according to the standards methods developed by Scanlon et al. (2002) including compensation for ambient temperature variations (Flint et al., 2002). The HDS calibrations included five point HDS measurements at varying suctions for each sensor. Individual water characteristic curves were subsequently developed for each sensor (van Genuchten, 1980). The van Genuchten coefficients for the individual sensors installed at the stockpile test plots are summarized in Table 10 and the laboratory calibration reports provided by DBS&A are included in Appendix E.

Delmhorst model 227 ERSs were also installed in selected instrumentation nests for measurement of soil matric potentials. The manufacturer's standard polynomial equation for converting sensor resistance to soil matric potential has been applied to the individual ERS as part of the test plot study.

FDR sensor calibrations were performed in the Golder laboratory using samples of representative cover and waste rock samples obtained from the No. 1 Stockpile. Work published by Whalley (1993) and White, et al. (1994) show an almost linear correlation between the square root of the soil dielectric constant (related to the DC voltage measured with the FDR sensors) and soil volumetric moisture content. The material-specific calibrations were conducted in accordance with the manufacturer's specifications (Dynamax, 1999). Specifically, the calibrations were developed by measuring the soil dielectric constant (from the FDR sensors) at varying water contents (determined gravimetrically at the DBS&A laboratory). Calibration equations for each material type were then developed that relate the DC voltage from the FDR sensors with in-situ soil volumetric moisture content. The individual calibration equations and calibration plots associated with the cover and waste rock are presented in Appendix F.

Manufacturer's calibration curves relating neutron counts to soil water content are supplied with neutron probes. However, it is important to develop site-specific calibrations to account for the type of access tube (PVC, aluminum, or steel pipe) and the material being monitored. Neutron probes are considered among the most accurate methods for measuring soil water content when properly calibrated. Special licensing, operator training, handling, shipping, and storage procedures are required because of the potential radiation safety hazards associated with neutron probes. The permits for this equipment have not been finalized and the calibrations for this equipment are still outstanding (see Section 4.0).

Factory calibrations were provided for each of the Druck model CS-420 pressure transducers installed within the lysimeter reservoirs at the No. 1 Stockpile test plots. These calibration certificates are provided in Appendix H.

3.3.2 Installation

The HDS, ERS, and FDR sensors were installed using a downhole emplacement and profile reconstruction method developed for this project. This method resulted in the installation of instruments with minimal disturbance of the cover. Specifically, this method involved installing a 4-inch diameter, schedule 40, PVC pipe vertically in the waste rock material following grading. The pipe was installed so that the terminal depth was about 220 cm in a covered condition. Following cover placement and seeding operations, the vadose zone instruments were lowered into the PVC pipe annulus to the target depths in a step wise manner. A section of the pipe was then lifted out of the hole and the void space was backfilled with either waste rock or cover as appropriate depending on the depth of the instrument, and the material was then compacted. At completion the entire length of pipe was removed. The waste rock and cover soil used as backfill was tamped using a closed end 1-inch PVC pipe to ensure good contact with the instruments. The waste rock and cover soils were screened (-1/4 inch) to eliminate the potential for bridging around the instruments.

The ERSs were installed at about 10 inches (25 cm) bgs directly in the pit or auger hole walls. The soils in the immediate vicinity of the block was saturated to improve the soil-instrument block contact. The holes were then backfilled with cover materials and lightly compacted.

The instrument cables were then routed through 1.5-inch diameter schedule 40 PVC pipes to the tripods used to secure and house the data loggers and solar panels. These pipes were then buried to protect the PVC from solar degradation.

3.3.3 Volumetric Lysimeters

At the request of the NMED, volumetric lysimeters were installed in 3 test plots at the No. 1 Stockpile (Plate 1). The lysimeters will allow measurement of cumulative drainage and provide confirmation of the drainage estimates obtained from the vadose zone monitoring nests. Lysimeters were installed in the 2- and 4-foot cover treatment top surface test plots and the 3-foot cover treatment on the 3:1 slope test plot.

The lysimeters consist of polyethylene cone bottom tanks (84-inch diameter and 48-inch height) with a 2-inch diameter Schedule 80 HDPE discharge pipe connected to the bottom of the tank. The as-built designs for the top surface and side slope lysimeters are presented in Plate 2.

Prior to commencing construction, each lysimeter location was surveyed using GPS survey equipment. A track hoe was used to excavate the waste rock to create an opening for placement of the lysimeter tank and discharge reservoir. The overall slopes of the excavation were maintained at gradients flatter than

about 2.5:1 to provide a safe working environment. During construction the excavation was benched in 2-foot cuts. Selected locations on these benches were cleared and leveled by hand using a shovel. Soil density was measured at a minimum of 3 locations using a nuclear density gauge. All density measurements were completed by a licensed technician provide by Summit Technical of Hurley, New Mexico. The soil density data are summarized in Table 11 and the laboratory reports are summarized in Appendix G.

The excavated waste rock was segregated by discrete depth increments and stored in piles adjacent to the excavation. In general, the piles represented materials from distinct 2-foot increments. As the excavation was advanced, each pile of material was covered with a plastic sheet to reduce the loss of moisture from the materials. The intent of the segregation and covering was to allow backfilling of the excavation with materials similar to those excavated.

Upon reaching the terminal depth of the excavation for the lysimeter tank, the base depth was measured. The depth of the excavation was determined by the cover thickness for the given test plot, such that the top of the lysimeter would be approximately 7 to 8 feet below the final cover grade. The area for the base of the lysimeter tank was compacted and molded to the conical geometry of the lysimeter base. The lysimeter tank was then set into place and leveled. Native materials were pushed into the open space between the lysimeter and the ground surface and compacted. A small trench was excavated for the discharge pipe and the lysimeter was set into place. Final leveling of the lysimeter was then performed.

A 55-gallon closed-top polyethylene drum was installed at the end of the trench in an excavation completed by the track hoe. The material beneath the drum was compacted and the drum was placed such that the grade on the discharge pipe between the lysimeter tank and the drum (storage reservoir) was at least 4 percent. The 55-gal drum, piping, and the lysimeter were backfilled until level with the 1-ft mark above the base of the lysimeter. Filter fabric and 10/20 silica sand (700 lbs) were placed into the lysimeter and spread out such that a level top surface was formed. Backfilling of the excavation was then completed in 2-foot lifts using materials from the depth appropriate stockpiles. As each sequential lift was completed, three in-situ density measurements were collected on the backfilled material. If the measurements indicated that further compaction was necessary to be within 10 percent of the average bulk density for the lift measured during excavation, additional compaction was completed using a hand tamper and/or the track hoe bucket. If the measurements indicated that the material was within 10 percent of the original measurements or greater than the original average density, no additional compacting of the materials was conducted. Material samples were collected at the midpoint and the top of the lysimeter for laboratory analysis.

Upon completion of the backfilling, the site was regraded using a grader to the extent practical without damaging the underlying or exposed pipes. Final grade at the center of the lysimeter was surveyed using GPS equipment.

3.3.4 Meteorological Station

A fully automated meteorological (met) station was assembled and installed at the No. 1 Stockpile (Plate 1). The met station consists of a tipping bucket rain gage (Texas Electronic model TE525); relative humidity/air temperature probe (Vaisala model HMP45AC); wind speed and direction sensor (R.M. Young model 05103); and silicon pyranometer for measuring solar radiation (Kipp & Zonen SP-LITE). The sensors are mounted on a 10-foot tripod anchored in place. The sensors and gauges are connected to a Campbell Scientific, Inc. CR-1000 data logger that is powered by an 86 amp-hour battery and charged by a 40W solar panel. Calibration certificates for the met station instruments are included in Appendix H.

3.4 Soil Erosion Monitoring

Soil erosion will be measured in the field using a portable erosionometer. Fabrication of the erosionometer was recently completed; however, the field measuring stations have not been constructed. Ground conditions associated with above normal precipitation in late August and early September prevented construction of the monitoring points. The erosion monitoring stations will be finalized in the fall as ground conditions permit (see Section 4).

3.5 Test Plot Costs

Costs associated with the construction and instrumentation of the test plots will be presented when the test plots are finalized and all costs are tabulated by Tyrone.

4.0 SCHEDULE FOR FUTURE WORK

The stockpile test plots were constructed and seeded in the summer of 2005. Subsequent work involved the installation of the vadose zone monitoring instruments. Outstanding items that need to be finalized prior to completion of the test plots include:

1) Selection of control plots,

2) Installation of the erosion monitoring points,

3) Fertilization of a section of the top surface plots,

4) Acquisition of the neutron probe certifications and licenses,

5) Neutron probe calibration, and

6) Cost summary.

Recent plans for the No.1 Stockpile, which involve complete reclamation of the facility, have eliminated the option of using this area for an uncovered control plot. An alternative site must be located for the uncovered control plots for the stockpiles. Tyrone is currently evaluating options with respect to the reclamation planning for the entire mine. The erosion transect locations for the stockpile test plots have not been approved. These features will be constructed in the fall of 2006 when the ground conditions are acceptable to avoid undo disturbance of the test plots. Fertilization of the plots will be completed in the early spring prior to the on-set of plant growth. Acquisition of a neutron probe license should be completed within the next 60 days. The probe will be calibrated within 120 days. Cost information will be finalized by Tyrone pending the installation of the erosion equipment and neutron access probe calibrations, but no later than December 15, 2006.

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TABLES

TABLE 1
CHEMICAL AND PHYSICAL CHARACTERIZATION METHODS

Analysis	Source-Method
Saturated Paste pH	SLS 1954 - Method 2 and 21a
Electrical Conductivity	SLS 1954 - Method 3a and 4b
Saturation Percentage	SLS 1954 - Method 2, 3a, 27a, & 27b
Particle Size Distribution	Gee and Bauder (1986)
Rock Fragment	Dry sieve/gravimetric
Organic Carbon	Walkley-Black Method (Dichromate oxidation)
Nitrate	1:2 - Cd reduction (Agron 9, 1982; Method 10-2.3.2)
Phosphorous	Sodium Bicarbonate (Agron 9, 1982; Method 24-5.4)

TABLE 2
SOIL-HYDRAULIC CHARACTERIZATION METHODS

Analysis	Method
Saturated hydraulic conductivity (K_{sat})	ASTM 2434-68
Moisture retention curves	ASTM D2325-68 (94)
Antecedent water content	Gardner (1986)
van Genuchten parameters (RETC4)	van Genuchten et al. (1997)
Rock fragment content	ASTM D2487-90
Particle density	Blake and Hartge (1986)

TABLE 3
DESCRIPTIVE SUMMARY OF COVER MATERIALS

Test Pit ID	Thickness (inches)	Surface Foot		Basal Foot		Notes
		Gravel	Cobble	Gravel	Cobble	
		% vol				
Test Plot 1 - 24" Top Surface Cover						
1A	30	50%	5%	25%	trace	stones 1% in 0-1' interval
1B	24	60%	5%	40%	5%	stones 2% in 0-1' interval
1C	28	50%	5%	25%	trace	stones 1% in 0-1' interval
1D	27	60%	5%	30%	2%	
1E	21	50%	5%	55%	5%	stones 1% in whole pit
Test Plot 2 - 36" Top Surface Cover						
2A	42	50%	5%	20%	-	
2B	37	50%	2%	50%	-	
2C	42	45%	1%	20%	-	stones-trace in 0-1' interval
2D	35	55%	5%	20%	-	stones-trace in 0-1' interval
2E	42	55%	<2%	45%	-	
Test Plot 3 - 48" Top Surface Cover						
3A	54	55%	1%	20%	-	
3B	48	50%	2%	40%	-	
3C	52	50%	5%	40%	trace	
3D	55	45%	trace	15%	-	
3E	51	50%	27%	50%	trace	
Test Plot 4 - 2.5:1 Slope 24" cover						
4A	33	45%	-	50%	-	
4Bi	19	35%	-	45%	trace	
4C	27	55%	-	55%	trace	
4D	20	45%	-	50%	-	
4E	22	55%	-	45%	-	
Test Plot 5 - 2.5:1 Slope 36" cover						
5A	46	50%	-	50%	trace	
5Bi	41	55%	-	55%	2%	
5C	34	45%	-	50%	-	
5D	39	50%	-	50%	2%	
5E	32	45%	-	55%	trace	
Test Plot 6 - 2.5:1 Slope 48" Cover						
6A	49	45%	-	45%	trace	
6B	51	50%	trace	50%	20%	
6C	56	50%	2%	50%	5%	
6D	50	50%	-	55%	-	
6E	58	45%	trace	45%	trace	
Test Plot 7 - 3:1 Slope 24" Cover						
7A	29	40%	1%	-	-	
7B	25	45%	1%	40%	-	
7C	28	55%	2%	35%	1%	
7D	27	45%	1%	55%	1%	
7E	24	55%	2%	45%	5%	
Test Plot 8 - 3:1 Slope 36" Cover						
8A	38	55%	-	45%	2%	
8B	37	45%	trace	55%	15%	
8C	47	55%	trace	50%	-	
8D	37	40%	trace	40%	-	
8E	39	50%	-	40%	-	4" layer of gravel @ 1.5'
Test Plot 9 - 3:1 Slope 48" Cover						
9A	55	45%	2%	55%	5%	
9B	51	50%	2%	50%	trace	
9C	51	50%	-	50%	20%	
9D	59	55%	trace	50%	2%	
9E	46	45%	2%	50%	10%	

Notes:
% vol = percent by volume
ND = not determined

TABLE 4
CHEMICAL AND PHYSICAL PROPERTIES OF COVER MATERIALS

Sample ID	Particle Size Distribution (%)			Rock Fragments (wt%)	Saturation Percentage (% water)	USDA Texture[a]	Saturated Paste		Organic Carbon (wt%)	Phosphorus	Nitrate
	Sand	Silt	Clay				pH	EC (dS/m)		mg/kg	
No. 1A-1, (0-12")	73	16	11	56	19.7	SL	7.1	0.66	0.07	5	<1
No. 1 1A-2, (17-29")	69	12	19	29	26.7	SL	7.4	1.76	0.17	3	3
No. 1 1B-1, (0-12")	79	8	13	49	19.8	SL	6.9	0.58	0.04	5	<1
No. 1 1B-2, (13-25")	79	10	11	59	21.5	SL	7.2	0.59	0.04	4	<1
No. 1 1C-1, (0-12")	71	14	15	52	22.9	SL	7.2	0.92	0.17	4	<1
No. 1 1C-2, (15-27")	65	12	23	24	27.7	SCL	7.3	2.29	0.20	3	1
No. 1 1D-1, (0-12")	75	13	12	59	21.1	SL	7.2	0.86	0.06	4	<1
No. 1 1D-2, (15-27")	67	12	21	31	27.0	SCL	7.4	2.65	0.14	4	2
No. 1 1E-1, (0-12")	69	16	15	61	26.0	SL	4.8	3.34	0.17	5	<1
No. 1 1E-2, (12-23")	75	10	15	64	24.4	SL	7.0	0.68	0.07	4	<1
No. 1 2A-1, (0-12")	70	15	15	58	24.1	SL	7.1	0.80	0.15	5	<1
No. 1 2A-2, (30-42")	67	13	20	30	26.9	SCL	7.2	1.82	0.18	3	7
No. 1 2B-1, (0-12")	75	13	12	60	22.9	SL	7.7	0.84	0.05	4	<1
No. 1 2B-2, (25-37")	75	12	13	61	21.5	SL	7.3	0.95	0.08	4	<1
No. 1 2C-1, (0-12")	71	14	15	59	24.2	SL	7.0	1.50	0.17	4	<1
No. 1 2C-2, (31-43")	55	16	29	22	29.4	SCL	7.2	1.60	0.31	3	2
No. 1 2D-1, (0-12")	67	12	21	27	23.2	SCL	7.0	2.50	0.17	4	17
No. 1 2D-2, (26-38")	70	15	15	60	22.9	SL	6.2	0.78	0.15	4	<1
No. 1 2E-1, (0-12")	73	12	15	51	22.5	SL	7.1	1.41	0.11	4	<1
No. 1 2E-2, (30-42")	75	16	9	56	20.0	SL	6.9	0.65	0.06	4	<1
No. 1 3A-1, (0-12")	72	17	11	62	20.9	SL	7.2	0.83	0.10	4	<1
No. 1 3A-2, (43-55")	73	9	18	35	19.0	SL	7.4	2.58	0.08	3	1
No. 1 3B-1, (0-12")	71	15	14	60	26.5	SL	7.1	1.34	0.21	4	<1
No. 1 3B-2, (36-48")	70	16	14	51	26.4	SL	7.3	1.36	0.19	4	<1
No. 1 3C-1, (0-12")	73	13	14	60	22.0	SL	7.4	1.24	0.09	4	<1
No. 1 3C-2, (41-53")	68	16	16	46	28.6	SL	7.4	1.83	0.16	3	<1
No. 1 3D-1, (0-12")	77	11	12	60	23.2	SL	7.2	1.38	0.12	4	<1
No. 1 3D-2, (39-51")	35	23	42	41	50.5	C	6.1	2.16	0.66	3	100
No. 1 3E-1, (0-12")	72	16	12	61	22.7	SL	7.3	1.29	0.16	4	1
No. 1 3E-2, (40-52")	78	12	10	54	20.7	SL	7.1	0.42	0.08	4	<1
No. 1 4A-1 (0-12")	70	17	13	47	25.5	SL	7.4	1.52	0.19	4	<1
No. 1 4A-2, (21-33")	77	11	12	49	21.8	SL	7.6	1.04	0.10	4	<1
No. 1 4B-1, (0-12")	74	10	16	47	26.5	SL	7.5	2.31	0.18	4	1
No. 1 4B-2, (7-19")	72	10	18	50	27.9	SL	7.2	3.11	0.13	4	<1
No. 1 4C-1, (0-12")	76	13	11	60	22.2	SL	7.6	0.98	0.07	4	<1
No. 1 4C-2, (15-27")	76	13	11	61	20.9	SL	7.5	0.65	0.05	4	<1

TABLE 4
CHEMICAL AND PHYSICAL PROPERTIES OF COVER MATERIALS

Sample ID	Particle Size Distribution (%)			Rock Fragments (wt%)	Saturation Percentage (% water)	USDA Texture[a]	Saturated Paste		Organic Carbon (wt%)	Phosphorus	Nitrate
	Sand	Silt	Clay				pH	EC (dS/m)		mg/kg	
No. 1 4D-1, (0-12")	76	11	13	55	24.1	SL	7.6	1.04	0.11	5	1
No. 1 4D-2, (8-20")	76	10	14	54	22.7	SL	7.5	1.68	0.09	4	1
No. 1 4E-1, (0-12")	70	17	13	55	24.6	SL	7.4	1.26	0.24	4	1
No. 1 4E-2, (10-22")	68	14	18	53	27.0	SL	7.3	1.96	0.15	3	1
No. 1 5A-1, (0-12")	72	12	16	53	24.9	SL	7.5	1.54	0.12	4	1
No. 1 5A-2, (34-46")	70	14	16	53	23.9	SL	7.5	1.31	0.16	5	1
No. 1 5B-1, (0-12")	72	14	14	53	23.1	SL	7.5	1.21	0.12	4	1
No. 1 5B-2, (29-41")	72	11	17	38	26.1	SL	7.3	1.81	0.16	4	2
No. 1 5C-1, (0-12")	74	12	14	55	25.1	SL	7.4	1.32	0.14	4	1
No. 1 5C-2, (22-34")	68	18	14	51	25.7	SL	7.4	1.42	0.15	4	1
No. 1 5D-1, (0-12")	72	15	13	55	23.2	SL	7.4	1.45	0.16	5	<1
No. 1 5D-2, (27-39")	72	14	14	53	24.0	SL	7.4	1.18	0.15	4	1
No. 1 5E-1, (0-12")	74	14	12	54	23.3	SL	7.3	1.34	0.15	4	<1
No. 1 5E-2 (20-32")	72	16	12	56	23.3	SL	7.8	1.21	0.13	4	<1
No. 1 6A-1, (0-12")	74	15	11	53	23.4	SL	7.5	1.24	0.15	4	<1
No. 1 6A-2, (37-49")	75	13	12	49	24.4	SL	7.7	1.54	0.11	4	<1
No. 1 6B-1, (0-12")	73	15	12	54	22.2	SL	7.6	1.12	0.20	4	1
No. 1 6B-2	76	14	10	62	21.4	SL	7.1	0.86	0.07	4	<1
No. 1 6C-1, (0-12")	68	16	16	53	27.6	SL	7.4	1.26	0.31	3	2
No. 1 6C-2, (44-56")	72	15	13	53	25.1	SL	7.6	1.87	0.13	4	<1
No. 1 6D-1, (0-12")	70	17	13	51	24.1	SL	7.8	1.58	0.12	4	<1
No. 1 6D-2, (38-50")	74	14	12	50	22.8	SL	7.7	1.43	0.06	4	1
No. 1 6E-1, (0-12")	70	16	14	49	22.6	SL	7.6	1.59	0.20	4	<1
No. 1 6E-2, (46-58")	74	9	17	33	25.5	SL	7.5	2.34	0.15	4	3
No. 1 7A-1, (0-12")	68	18	14	50	25.2	SL	7.5	1.36	0.32	4	2
No. 1 7A-2, (17-29")	72	14	14	49	26.0	SL	6.7	1.18	0.24	3	1
No. 1 7B-1, (0-12")	69	17	14	55	24.3	SL	7.4	2.19	0.22	4	<1
No. 1 7B-2, (13-25")	70	15	15	49	27.0	SL	7.5	1.02	0.19	3	2
No. 1 7C-1, (0-12")	70	16	14	55	24.4	SL	7.5	1.48	0.21	4	1
No. 1 7C-2, (16-28")	70	16	14	53	23.9	SL	7.7	0.90	0.13	4	1
No. 1 7D-1, (0-12")	72	16	12	56	23.0	SL	7.5	1.25	0.10	4	1
No. 1 7D-2, (15-27")	76	12	12	63	22.1	SL	7.7	1.07	0.05	4	<1
No. 1 7E-1, (0-12")	70	16	14	51	23.0	SL	6.0	0.70	0.25	4	<1
No. 1 7E-2, (12-24")	74	14	12	54	23.8	SL	6.7	1.02	0.15	4	1
No. 1 8A-1, (0-12")	70	18	12	50	25.2	SL	7.7	1.08	0.15	4	2
No. 1 8A-2, (26-38")	72	15	13	45	22.7	SL	7.6	1.29	0.14	4	2

TABLE 4
CHEMICAL AND PHYSICAL PROPERTIES OF COVER MATERIALS

Sample ID	Particle Size Distribution (%)			Rock Fragments (wt%)	Saturation Percentage (% water)	USDA Texture[a]	Saturated Paste		Organic Carbon (wt%)	Phosphorus	Nitrate
	Sand	Silt	Clay				pH	EC (dS/m)		mg/kg	
No. 1 8B-1, (0-12")	72	17	11	54	22.6	SL	7.8	1.42	0.09	4	2
No. 1 8B-2, (25-37")	72	17	11	58	23.0	SL	7.9	1.20	0.12	4	2
No. 1 8C-1, (0-12")	70	19	11	59	26.6	SL	7.8	1.42	0.16	4	3
No. 1 8C-2, (35-47")	74	14	12	59	24.2	SL	7.9	1.08	0.15	4	2
No. 1 9A-2, (26-38")	70	17	13	60	25.7	SL	7.6	1.35	0.20	4	2
No. 1 9B-1, (0-12")	72	16	12	62	26.8	SL	7.7	1.50	0.16	4	2
No. 1 9C-1, (0-12")	70	18	12	61	23.8	SL	7.7	1.04	0.17	4	2
No. 1 9C-2, (35-47")	74	14	12	64	24.1	SL	7.8	1.20	0.17	3	2
No. 1 9D-1, (0-12")	73	12	15	58	25.2	SL	7.8	1.02	0.14	4	2
No. 1 9D-2, (35-47")	74	13	13	61	25.7	SL	7.8	1.38	0.11	4	1
No. 1 9E-1, (0-12")	69	15	16	65	25.2	SL	7.9	1.07	0.12	4	2
No. 1 9E-2, (42-54")	70	15	15	59	24.5	SL	7.8	1.08	0.21	4	2

Notes:
a) USDA Texture = texture class according to Soil Survey Division Staff (1993)
wt % = percent by weight
dS/m = deciSiemens per meter
mg/kg = milligrams per kilogram

TABLE 5
CHEMICAL AND PHYSICAL PROPERTIES OF WASTE ROCK SAMPLES

Sample ID	Particle Size Distribution (%)			Rock Fragments (%wt)[a]	USDA Texture[b]	Saturated Paste		Saturation Percentage (% water)
	Sand	Silt	Clay			pH	EC (dS/m)	
No.1 Lys 3-A, 0-2'	50	27	23	34	SCL	2.9	6.50	40.1
No. 1 Lys-3A, 2-3'	50	27	23	45	SCL	2.9	6.43	38.6
No. 1 8-A Lys Top, 6' bgs	52	25	23	51	SCL	2.5	6.32	36.7
No. 1 8-A Lys Mid 8' bgs	50	27	23	58	SCL	2.7	5.55	36.0
No. 1 TP-8, 4' bgs	52	25	23	46	SCL	2.7	5.75	35.9
No. 1 TP-8, 6' bgs	51	26	23	44	SCL	2.8	5.45	36.3
No. 1 TP-8, 8' bgs	51	26	23	52	SCL	2.8	5.27	35.2
No. 1 1-B, 0-2'	48	29	23	41	L	3.4	7.06	39.3
No. 1 1-B, 2-3'	50	27	23	51	SCL	3.4	7.35	39.5
No. 1 1-B, 4-5'	48	30	22	42	L	3.6	7.28	39.0
No. 1 1-C, 0-2'	48	30	22	42	L	2.9	6.02	40.8
No. 1 1-C, 2-3'	50	28	22	35	L	2.8	5.74	40.9
No. 1 1-C, 4-5'	42	34	24	32	L	2.9	5.43	42.8
No. 1 2-A, (0-2')	50	28	22	42	L	3.1	7.80	41.4
No. 1 2-A, (3-4')	50	28	22	49	L	3.0	8.17	38.7
No. 1 3-B, (0-2')	54	25	21	37	SCL	2.5	6.53	33.7
No. 1 3-B, (2-3')	48	29	23	45	L	2.7	6.01	32.8
No. 1 3-C, (0-2')	47	31	22	53	L	3.1	8.56	37.9
No. 1 3-C, (2-3')	50	25	25	52	SCL	3.2	8.44	39.2
No. 1 4-A, 0-2'	46	28	26	41	L	2.6	7.21	40.1
No. 1 4-A, 2-3'	46	29	25	36	L	2.5	7.21	39.4
No. 1 4-A, 4-5'	46	27	27	37	SCL	2.7	7.12	41.4
No. 1 5-A, 0-2'	47	27	26	47	SCL	2.8	5.75	42.3
No. 1 5-A, 3-4'	47	27	26	51	SCL	2.4	7.77	40.3
No. 1 6-A, 0-2'	47	28	25	45	L	2.8	6.30	40.3
No. 1 6-A, 2-3'	46	29	25	47	L	2.8	5.45	39.9
No. 1 7-A, 0-2'	52	25	23	51	SCL	2.0	9.41	30.8
No. 1 7-A, 2-3'	50	24	26	49	SCL	2.2	7.94	34.8
No. 1 7-A, 4-5'	50	24	26	53	SCL	2.4	6.86	34.6
No. 1 8-A, 0-2'	48	28	24	52	L	2.7	5.32	37.0
No. 1 8-A, 3-4'	46	29	25	46	L	2.8	5.74	39.6
No. 1 9-A, 0-2'	51	25	24	58	SCL	2.1	11.40	31.8
No. 1 9-A, 2-3'	58	22	20	60	SCL	3.2	10.30	27.7
No. 1 10-A, 0-2'	46	28	26	49	L	3.0	6.28	44.0
No. 1 10-A, 3-4'	48	28	24	47	L	2.9	6.70	43.2
No. 1 10-A, 4-5'	46	28	26	43	L	2.8	7.10	41.6
No. 1 10-A, 6-7'	51	27	22	46	SCL	2.8	6.51	40.5
No. 1 Lys 1-A, 0-2'	50	24	26	50	SCL	2.6	9.39	42.2
No. 1 Lys 1-A, 2-3'	50	24	26	41	SCL	2.5	10.80	41.1
No. 1 Lys 1-A, 4-5'	46	27	27	47	SCL	2.7	10.60	42.0

Notes:
a) Rock fragments based on laboratory measurements.
b) USDA Texture = texture class according to Soil Survey Division Staff (1993)
bgs = below ground surface
wt % = percent by weight
dS/m = deciSiemens per meter

TABLE 6
SOIL HYDRAULIC PROPERTIES OF COVER MATERIALS

Sample ID	Rock Fragments[a] (vol %)	Particle Density (g/cm^3)	Saturated Hydraulic Conductivity (cm/s)		Volumetric Water Content (cm^3/cm^3)				van Genuchten Coefficients	
					θ_r		θ_s		α	N
			<2mm	whole soil	<2mm	whole soil	<2mm	whole soil	1/cm	dimensionless
No1-1-1	61.69	2.64	1.3E-02	3.3E-03	0.00	0.00	37.94	14.53	0.0632	1.2258
No1-1-2	44.79	2.65	3.5E-02	1.4E-02	0.00	0.00	44.45	24.54	0.1454	1.2114
No1-2-1	50.12	2.62	5.0E-03	1.7E-03	0.00	0.00	39.93	19.92	0.0775	1.2169
No1-2-2	51.43	2.60	1.6E-02	5.4E-03	0.00	0.00	42.94	20.86	0.1465	1.2127
No1-3-1	45.03	2.64	1.9E-02	7.3E-03	0.00	0.00	35.31	19.41	0.0119	1.2783
No1-3-2	41.61	2.62	2.6E-02	1.1E-02	0.00	0.00	31.88	18.61	0.0213	1.2513
No1-8-LY	49.83	2.59	1.1E-02	3.8E-03	0.00	0.00	39.00	19.57	0.0795	1.2128

Notes:
a) Rock fragment contents based on laboratory samples.
Θ_r = residual moisture content
Θ_s = saturated moisture content
whole soil = value corrected for lab gravel content
cm^3/cm^3 = cubic centimeter per cubic centimeter
g/cm^3 = grams per cubic centimeter
cm/s = centimeters per second
mm = millimeters
vol % = percent by volume

TABLE 7
SOIL HYDRAULIC PROPERTIES OF WASTE ROCK SAMPLES

Sample ID (depth interval)	Rock Fragments (vol %)[a]	Particle Density (g/cm^3)	Saturated Hydraulic Conductivity (cm/s)		Volumetric Water Content (cm^3/cm^3)					van Genuchten Coefficients	
					θ_r		θ_s		θ_i	α	N
			<2mm	whole soil	<2mm	whole soil	<2mm	whole soil	whole soil	1/cm	dimensionless
1B (0-2')	54.6	2.67	1.6E-03	7.3E-04	0.0000	0.0000	0.4655	0.2111	0.0780	0.1509	1.1564
1B (2-3')	55.0	2.58	1.9E-03	8.5E-04	0.0000	0.0000	0.5106	0.2296	0.0800	0.1731	1.1751
1B (4-5')	35.2	2.58	7.9E-04	5.1E-04	0.0000	0.0000	0.4642	0.3008	0.1186	0.1006	1.1683
3C (0-2')	47.5	2.66	1.6E-03	8.4E-04	0.0000	0.0000	0.4924	0.2587	0.0809	0.1266	1.1746
3C (2-3')	44.4	2.61	2.5E-03	1.4E-03	0.0000	0.0000	0.4974	0.2764	0.1017	0.1369	1.1787
5A (3-4')	40.9	2.59	2.7E-04	1.6E-04	0.0000	0.0000	0.4576	0.2702	0.0998	0.0605	1.1964
7A (0-2')	62.8	2.64	1.9E-04	7.1E-05	0.0000	0.0000	0.4523	0.1683	0.0629	0.0455	1.1974
10A (6-7')	57.8	2.64	2.0E-04	8.5E-05	0.0000	0.0000	0.4288	0.1811	0.0672	0.0628	1.1877

Notes:
a) Rock fragments based on laboratory measurements.
Θ_r = residual water content
Θ_s = saturated water content
Θ_i = initial water content
whole soil = corrected for lab gravel content
cm^3/cm^3 = cubic centimeter per cubic centimeter
g/cm^3 = grams per cubic centimeter
cm/s = centimeters per second
mm = millimeters
vol % = percent by volume

TABLE 8
RECLAMATION SEED MIX AND RATES

Common Name	Scientific Name	PLS lbs. per acre
Blue grama	*Bouteloua gracilis*	0.25
Sideoats grama	*Bouteloua curtipendula*	1.25
Galleta	*Hilaria jamesii*	0.40
Green sprangletop	*Leptochloa dubia*	0.15
Sand dropseed	*Sporobolus cryptandrus*	0.05
Bottlebrush squirreltail	*Elymus elymoides*	1.25
Indian ricegrass	*Oryzopsis hymenoides*	1.75
Streambank wheatgrass	*Agropyron dastachyum v. riparium*	1.50
Rubber rabbitbrush	*Chrysothamnus nauseosus*	0.15
Mountain mahogany	*Cercocarpus montanus*	1.00
Winterfat	*Certoides lanata*	0.60
White prairie clover	*Dalea candidum*	0.20
Blue flax	*Linum lewisii*	0.15
Prairie coneflower	*Ratibida columnifera*	0.20
Total		**8.90**

Notes:
PLS = pure live seed

TABLE 9
VADOSE ZONES INSTRUMENTATION SUMMARY

Test Plot Slope/Cover Depth (feet)	TP No.	Instrumentation Nest	Instrumentation/Monitoring Devices								Installation Date	Data Logger Number
			Heat Dissipiation Sensors (HDS)		Frequency Domain Reflectometers (FDR)		Electrical Resistance Sensors (ERS)		Pressure Transducer			
			Serial Number	Installation Depth (inches)	Serial Number	Installation Depth (inches)	Serial Number	Installation Depth (inches)	Serial Number	Installation Depth (inches)		
Top Surface 2' Cover	1	1A	10207	19.5	163/038	19.7	152494	10	2147078	209	11/15/2005 and 11/14/2005	PB 31
			10210	39.5	163/028	39.5						
			10208	59	163/026	59						
			10209	78.5	163/035	79						
		1B	10196	19.5			152466	9.8			11/16/2005	
			10198	39.5								
			10197	59								
			10195	78.7								
		1C	10206	19			152495	10			11/15/2005	
			10205	39.5								
			10203	59								
			10204	78.5								
Top Surface 3' Cover	2	2A	10200	29.5			152466	9.8			11/16/2005	
			10202	39								
			10201	59.1								
			10199	78.7								
Top Surface 4' Cover	3	3A	10345	39	163/021	38.5	152478	10	2148658	215	11/17/2005	PB 32
			10344	59.5	163/050	58						
			10343	70.5	163/025	70						
			10342	78.5	163/030	78.5						
		3B	10333	39.5			152479	9.8			11/17/2005	
			10331	59								
			10332	71								
			10330	78.7								
		3C	10307	39			152480	9.8			11/17/2005	
			10308	59.3								
			10306	70.5								
			10305	79								
2.5:1 Slope 2' Cover	4	4A	10309	19.7							11/18/2005	PB 33
			10310	39.5								
			10311	59								
			10312	78.5								
2.5:1 Slope 3' Cover	5	5A	10338	29.5							11/18/2005	
			10341	39.4								
			10340	59.1								
			10339	78.7								
2.5:1 Slope 4' Cover	6	6A	10313	39.7							11/17/2005	
			10314	58.5								
			10315	70.5								
			10316	78.5								
3:1 Slope 2' Cover	7	7A	10320	19.7							12/13/2005	PB 34
			10319	39.5								
			10318	59								
			10317	78.7								
3:1 Slope 3' Cover	8	8A	10337	29.5	162/044	29.5	148563	9.8	2147084	209	12/13/2005	
			10336	39.5	162/043	39.5						
			10335	59	162/042	59						
			10334	78.5	162/023	78.7						
3:1 Slope 4' Cover	9	9A	10324	39.5							12/14/2005	
			10323	59.1								
			10322	70								
			10321	78.5								

TABLE 10
HDS CHARACTERIZATION AND CALIBRATION DATA

Sensor Serial Number	van Genuchten Parameters				T* at Each Calibration Point					
	α	N	delta T		764850	1.0198	1019.8	3059.4	13257.4	15297
			dry	wet	cm					
10195	0.00360	1.5746	2.795	0.685	0	1	0.4389	0.2270	0.1166	-
10196	0.00294	1.6252	2.676	0.692	0	1	0.4788	0.2374	0.1159	-
10197	0.00336	1.6732	2.633	0.619	0	1	0.4136	0.2120	0.0725	-
10198	0.00307	1.6270	2.523	0.692	0	1	0.4615	0.2441	0.0983	-
10199	0.00454	1.6134	2.548	0.701	0	1	0.3795	0.1949	0.0855	-
10200	0.00358	1.6821	2.607	0.685	0	1	0.3949	0.1961	0.0702	-
10201	0.00423	1.5795	2.642	0.693	0	1	0.4156	0.2196	0.1047	-
10202	0.00431	1.5358	2.795	0.725	0	1	0.3942	0.1935	0.0559	-
10203	0.00361	1.6146	2.932	0.692	0	1	0.4663	0.2737	0.1131	-
10204	0.00420	1.5762	2.875	0.692	0	1	0.4106	0.2090	0.0994	-
10205	0.00370	1.5948	2.745	0.709	0	1	0.3761	0.1570	0.0598	-
10206	0.00340	1.5790	2.504	0.733	0	1	0.4326	0.2572	0.1391	-
10207	0.00362	1.5841	2.644	0.766	0	1	0.3846	0.2187	0.1303	-
10208	0.00327	1.6600	2.709	0.757	0	1	0.4229	0.2205	0.0970	-
10209	0.00784	1.4681	2.794	0.717	0	1	0.4393	0.2215	0.1247	-
10210	0.00340	1.6561	2.677	0.692	0	1	0.4439	0.2393	0.1213	-
10305	0.00390	1.5578	2.580	0.708	0	1	0.4202	0.2309	0.1070	-
10306	0.00394	1.5609	2.726	0.684	0	1	0.4312	0.2467	0.1226	-
10307	0.00397	1.5388	2.789	0.717	0	1	0.4703	0.2576	0.1106	-
10308	0.00357	1.5674	2.755	0.725	0	1	0.4419	0.2766	0.1710	-
10309	0.01181	1.4303	2.531	0.631	0	1	0.3458	0.1937	-	0.1316
10310	0.00473	1.5755	2.777	0.684	0	1	0.3939	0.2084	0.0996	-
10311	0.00577	1.5433	2.743	0.700	0	1	0.3749	0.2040	0.1028	-
10312	0.00362	1.5897	2.695	0.683	0	1	0.4427	0.2402	0.1043	-
10313	0.00389	1.5910	2.648	0.692	0	1	0.4248	0.2314	0.0976	-
10314	0.00309	1.6557	2.792	0.692	0	1	0.4492	0.2166	0.0996	-
10315	0.00935	1.4574	2.712	0.712	0	1	0.3580	0.1975	-	0.1250
10316	0.00385	1.4783	2.878	0.812	0	1	0.4821	0.3417	-	0.1210
10317	0.00390	1.6621	2.690	0.684	0	1	0.3887	0.1798	0.0871	-
10318	0.00400	1.4604	3.015	0.700	0	1	0.4972	0.3166	0.1661	-
10319	0.00450	1.5656	2.633	0.748	0	1	0.4084	0.2251	0.1018	-
10320	0.00470	1.5319	2.516	0.692	0	1	0.4222	0.2381	0.1176	-
10321	0.00370	1.5378	2.597	0.733	0	1	0.4658	0.2705	0.1246	-
10322	0.00330	1.5946	2.701	0.700	0	1	0.4618	0.2520	0.1070	-
10323	0.00440	1.5211	2.767	0.748	0	1	0.4429	0.2541	0.1270	-
10324	0.00550	1.4951	2.771	0.757	0	1	0.4172	0.2418	0.1296	-
10330	0.00619	1.5243	2.733	0.871	0	1	0.3762	0.2028	0.1121	-
10331	0.00391	1.6122	2.700	0.692	0	1	0.4145	0.2112	0.0969	-
10332	0.00381	1.6514	2.808	0.691	0	1	0.4015	0.1861	0.0940	-
10333	0.00414	1.6023	2.873	0.749	0	1	0.4077	0.2073	0.0993	-
10334	0.00459	1.5758	2.865	0.691	0	1	0.4001	0.2130	0.1004	-
10335	0.00400	1.5868	2.816	0.806	0	1	0.4216	0.2283	0.0996	-
10336	0.00372	1.6291	2.816	0.716	0	1	0.4176	0.2048	0.0976	-
10337	0.00280	1.6451	2.811	0.749	0	1	0.4804	0.2364	0.1095	-
10338	0.00400	1.5548	2.828	0.717	0	1	0.4481	0.2364	0.1260	-
10339	0.00370	1.6391	2.828	0.749	0	1	0.4124	0.2161	0.0814	-
10340	0.00369	1.5245	2.588	0.700	0	1	0.4517	0.2547	0.1077	-
10341	0.00324	1.6234	2.761	0.692	0	1	0.4746	0.2380	0.1151	-
10342	0.00450	1.5751	2.589	0.724	0	1	0.4038	0.2177	0.0999	-
10343	0.00551	1.5311	2.573	0.700	0	1	0.3907	0.2192	0.1085	-
10344	0.00387	1.5543	3.074	0.676	0	1	0.4449	0.2609	0.1081	-
10345	0.00408	1.6579	2.814	0.692	0	1	0.3812	0.1767	0.0861	-

Notes:
delta T = temperture differnce before and immediately after heating period
T* = normalized delta T (Flint et al., 2002)

TABLE 11
IN-SITU AND BACKFILL DENSITIES FOR THE LYSIMETER INSTALLATIONS

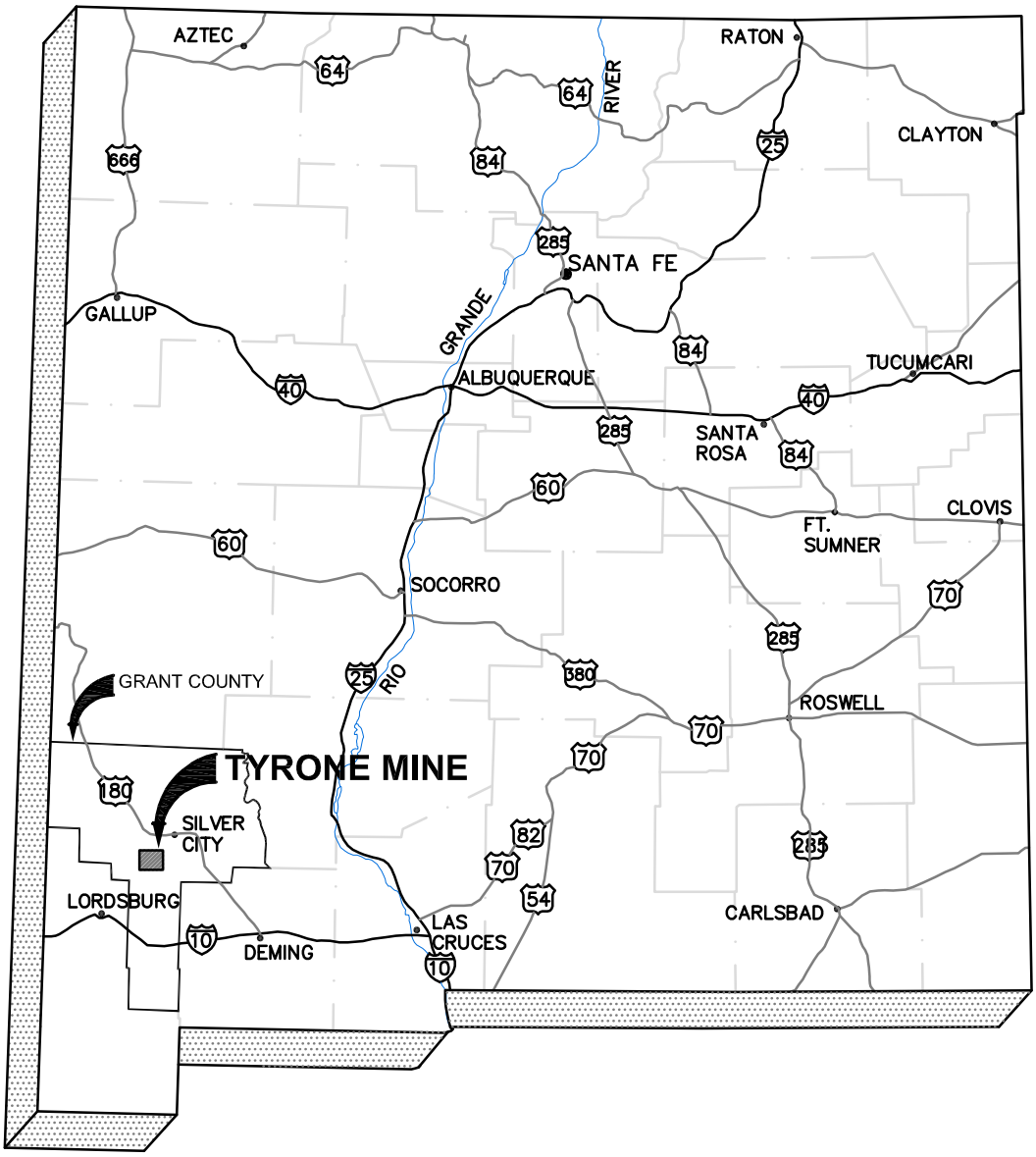
Depth (feet bgs)	Density (lbs/ft^3)		Percent of initial value	Water content (wt %)		Percent of initial value
	In-situ	Backfilled		In-situ	Backfilled	
LYSIMETER 1A - Top Surface 24" Cover						
0	94.7	93.1	98.3	9.0	9.5	106
2	78.6	91.9	116.9	14.3	9.0	63
4	84.0	82.1	97.7	16.6	11.0	66
6	76.0	87.2	114.7	16.8	10.1	60
8	80.5	81.0	100.5	14.9	9.1	61
LYSIMETER 3A - Top Surface 48" Cover						
0	93.9	94.9	101.1	6.0	8.6	143
2	81.6	89.9	110.2	9.3	7.9	86
4	85.4	87.6	102.6	8.9	6.4	72
6	83.1	87.6	105.4	8.4	8.6	102
8	85.8	84.2	98.1	11.7	10.0	85
LYSIMETER 8A - 3:1 Slope 36" Cover						
0	71.9	91.5	103.4	7.6	7.7	100
2	85.1	93.2	113.0	10.0	9.8	99
4	76.0	87.7	110.8	10.1	8.8	87
6	66.7	88.1	111.8	11.7	9.0	77
8	80.3	89.3	103.1	10.9	9.3	85

Notes:
lbs/ft^3 = pounds per cubic foot
wt % = percent by weight

FIGURES

STATE OF NEW MEXICO

NOT TO SCALE



PROJECT	PHELPS DODGE TYRONE INC. NO.1 STOCKPILE TEST PLOTS GRANT COUNTY, NEW MEXICO				
TITLE	**GENERAL LOCATION OF TYRONE MINE**				
Golder Associates Albuquerque, New Mexico	PROJECT No.	053-2273	FILE No.	FIGURE01	
	DESIGN	DR 09/28/06	SCALE AS SHOWN	REV. 0	
	CADD	CM 09/28/06	**FIGURE 1**		
	CHECK	DR 09/28/06			
	REVIEW	LM 09/28/06			

Drawing file: FIGURE01.dwg Sep 29, 2006 - 10:20am

HIGHWAY 90

NO.1 STOCKPILE

TP #6
4'
TP #3
4'
TP #9
4'
TP #5
3'
TP #2
3'
TP #8
3'
TP #4
2'
TP #1
2'
TP #7
2'

BRICK KILN GULCH

LEGEND

- PRE-RECLAMATION TOPOGRAPHY
- AS-BUILT TOPOGRAPHY (BY MWH SEPTEMBER 2006)
- BORROW AREA

200 0 200 400
SCALE D SIZE: 1" = 200'
SCALE B SIZE: 1" = 400'
FEET

PROJECT
PHELPS DODGE TYRONE INC.
NO.1 STOCKPILE TEST PLOTS
GRANT COUNTY, NEW MEXICO

TITLE
GENERAL OVERVIEW AND BORROW AREA

Golder Associates
Albuquerque, New Mexico

PROJECT No.		053-2377	FILE No. No1 Stkp Instrument	
DESIGN	DR	09/26/06	SCALE AS SHOWN	REV. 0
CADD	CM	09/26/06		
CHECK	DR	09/26/06		
REVIEW	LM	09/29/06		

FIGURE 2

Drawing file: No1 Stkp Overview.dwg Sep 29, 2006 - 10:19am

HIGHWAY 90

NO.1
STOCKPILE

TP#6
4'
0.96 AC.

TP#3
4'
1.21 AC.

TP#9
4'
1.78 AC.

TP#5
3'
1.16 AC.

TP#2
3'
1.23 AC.

TP#8
3'
1.70 AC.

TP#4
2'
1.40 AC.

TP#1
2'
1.16 AC.

TP#7
2'
1.75 AC.

LEGEND

- 9A — COVER SAMPLES
- 6C — WASTE ROCK SAMPLES
- 5A — HYDRAULIC SAMPLES (COVER AND WASTE ROCK)
- TEST PLOT BOUNDARY
- FENCE
- PRE-RECLAMATION TOPOGRAPHY
- AS-BUILT TOPOGRAPHY (BY MWH SEPTEMBER 2006)

N

80 0 80 160
SCALE D SIZE: 1" = 80' FEET
SCALE B SIZE: 1" = 160'

PROJECT
PHELPS DODGE TYRONE INC.
NO.1 STOCKPILE TEST PLOTS
GRANT COUNTY, NEW MEXICO

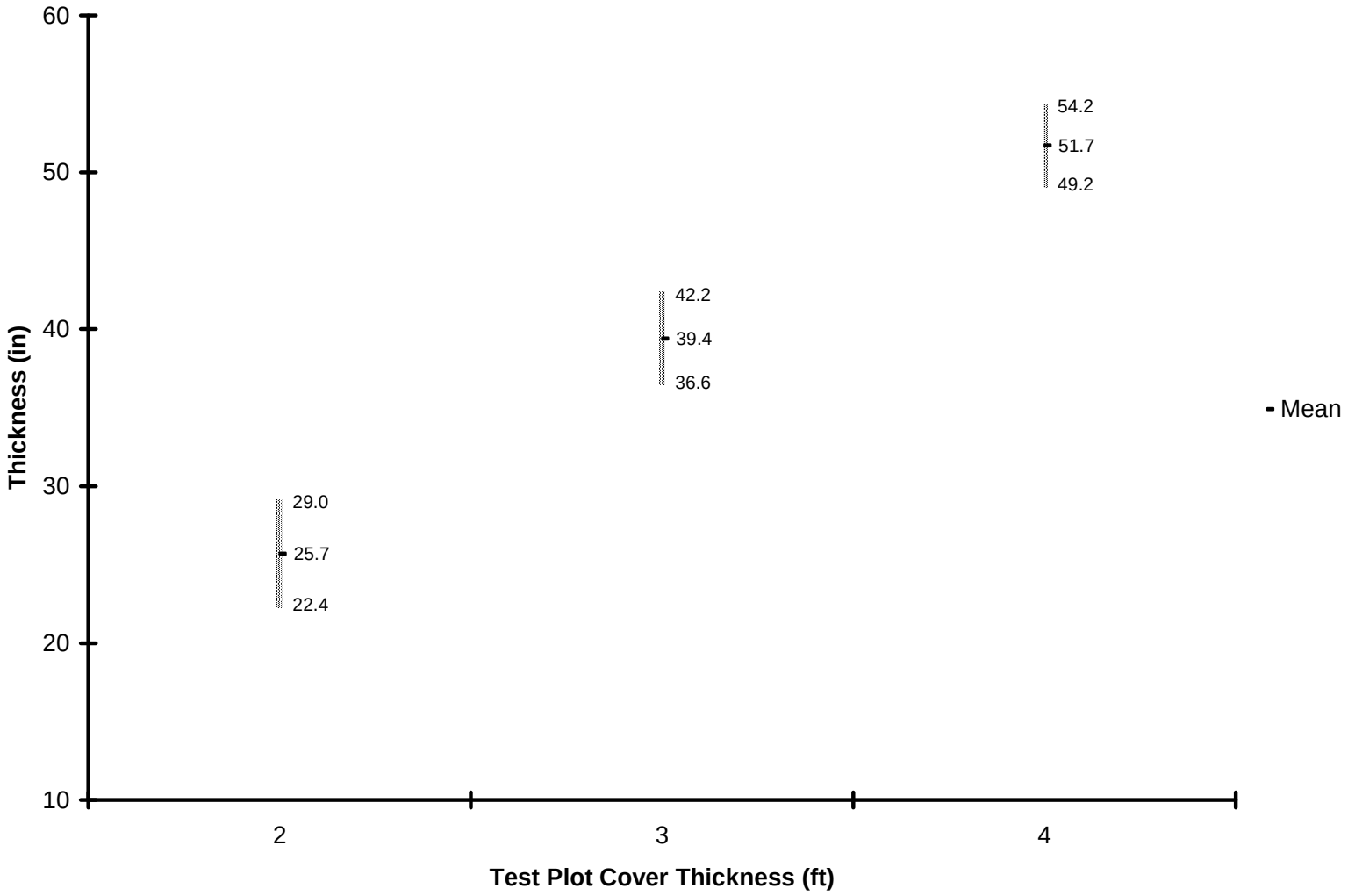
TITLE
COVER AND WASTE ROCK SAMPLE LOCATIONS

Golder Associates
Albuquerque, New Mexico

PROJECT No.		053-2377	FILE No. No1 Stkp Instrument	
DESIGN	DR	09/26/06	SCALE AS SHOWN	REV. 0
CADD	CM	09/26/06		
CHECK	DR	09/26/06		
REVIEW	LM	09/29/06		

FIGURE 3

Drawing File: No1 Stkp Sample.dwg Sep 29, 2006 - 10:49am



Plots measured on 6/28/05

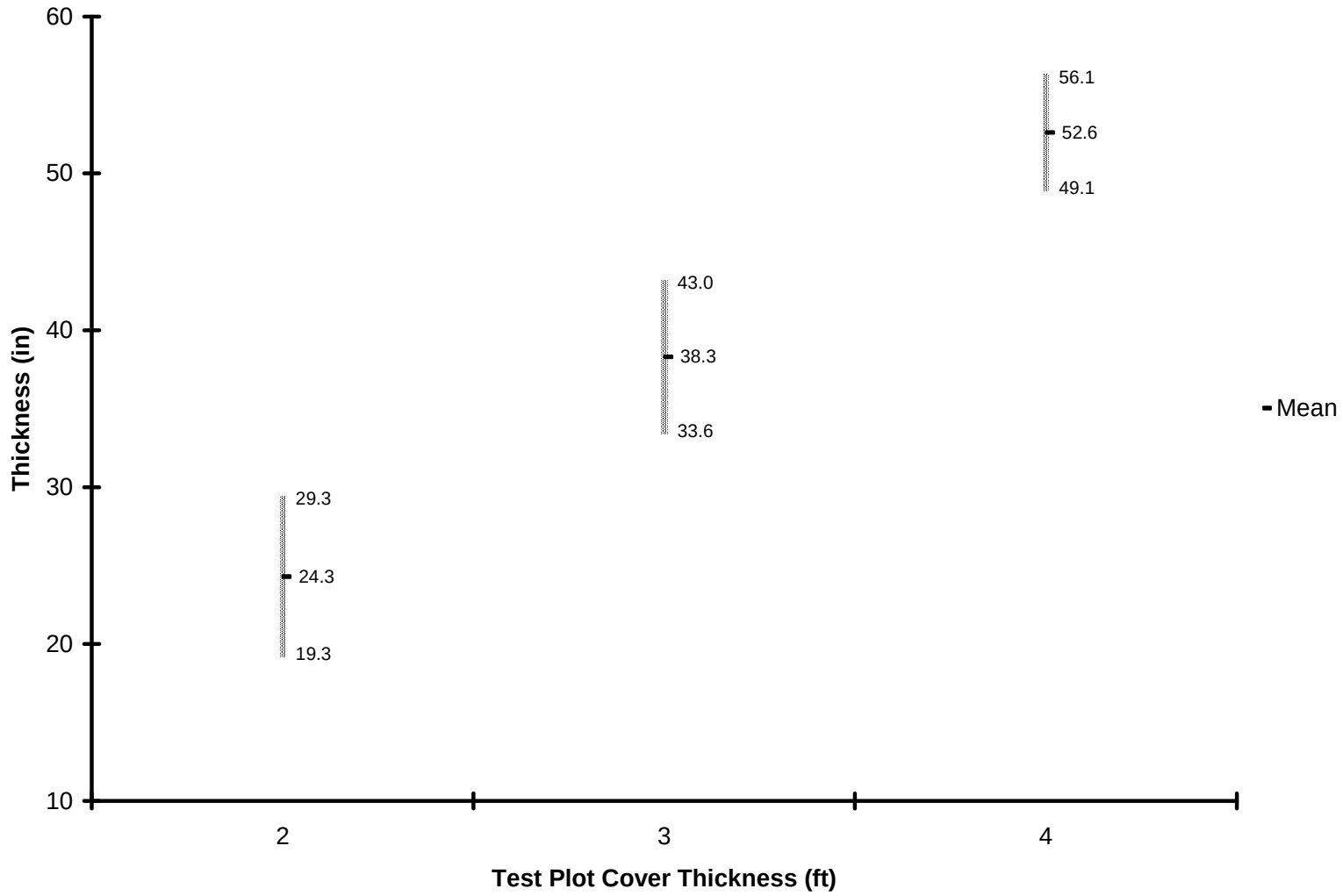
Golder Associates

Albuquerque, New Mexico

TITLE

COVER THICKNESS ASSESSMENT – TOP SURFACE TEST PLOTS
(MEAN +/- 95% CONFIDENCE INTERVAL)

CLIENT/PROJ **PHELPS DODGE TYRONE, INC** **AS-BUILT REPORT** **NO. 1 STOCKPILE TEST PLOTS**	DRAWN DR	DATE 09/27/06	JOB NO 053-2377
	CHECKED TS	SCALE NA	**FIGURE 4**
	REVIEWED LM	FILE No. 1 AS-BUILT FIGURES	



Plots measured on 8/2/05

Golder Associates

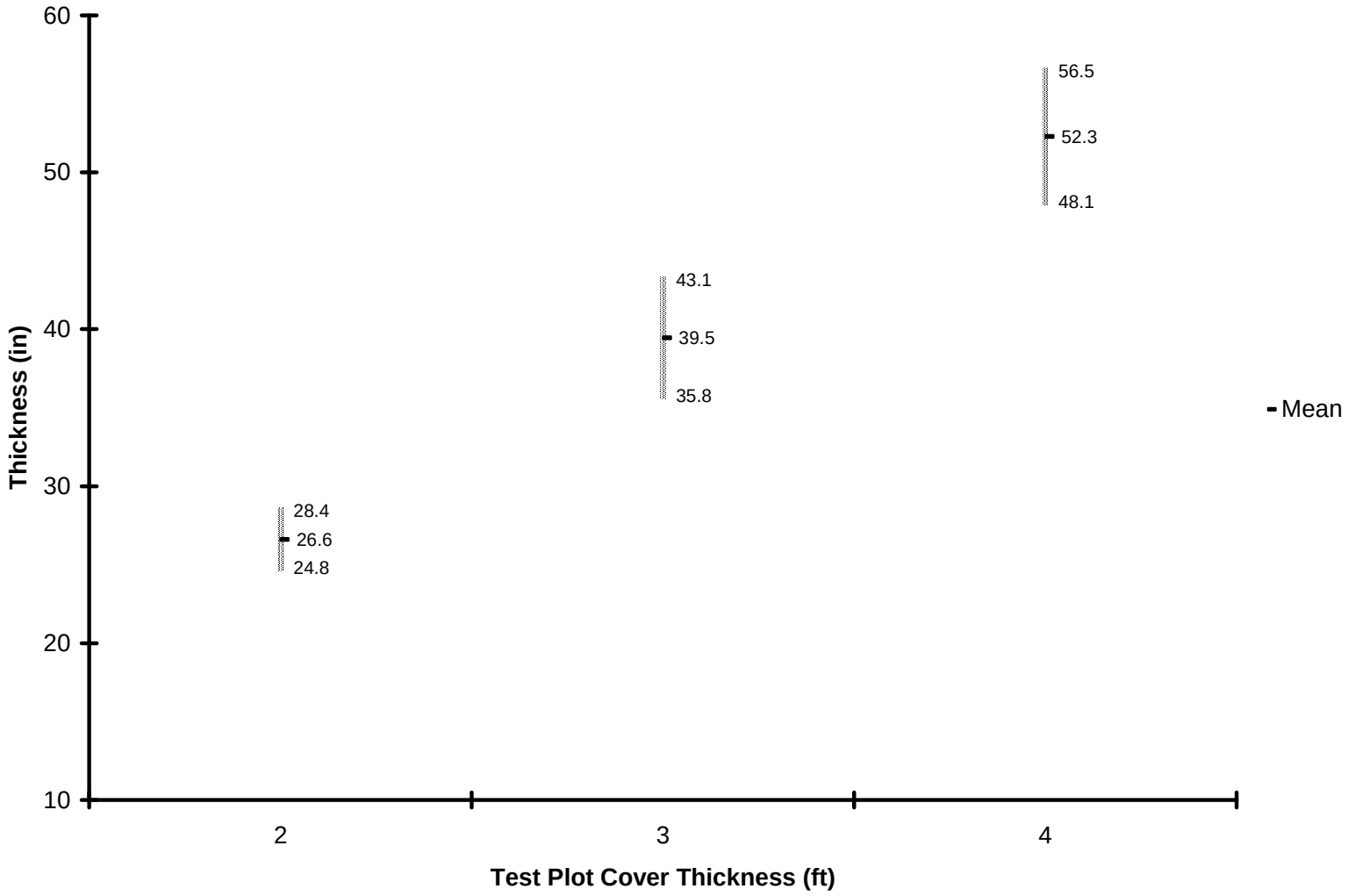
Albuquerque, New Mexico

TITLE

COVER THICKNESS ASSESSMENT – 2.5:1 TEST PLOTS

(MEAN +/- 95% CONFIDENCE INTERVAL)

CLIENT/PROJ	DRAWN	DATE	JOB NO.
PHELPS DODGE TYRONE, INC **AS-BUILT REPORT** **NO. 1 STOCKPILE TEST PLOTS**	DR	09/27/06	053-2377
	CHECKED: TS	SCALE: NA	**FIGURE 5**
	REVIEWED: LM	FILE: No. 1 AS-BUILT FIGURES	



Plots measured on 7/14/05 and 8/2/05

Golder Associates

Albuquerque, New Mexico

TITLE

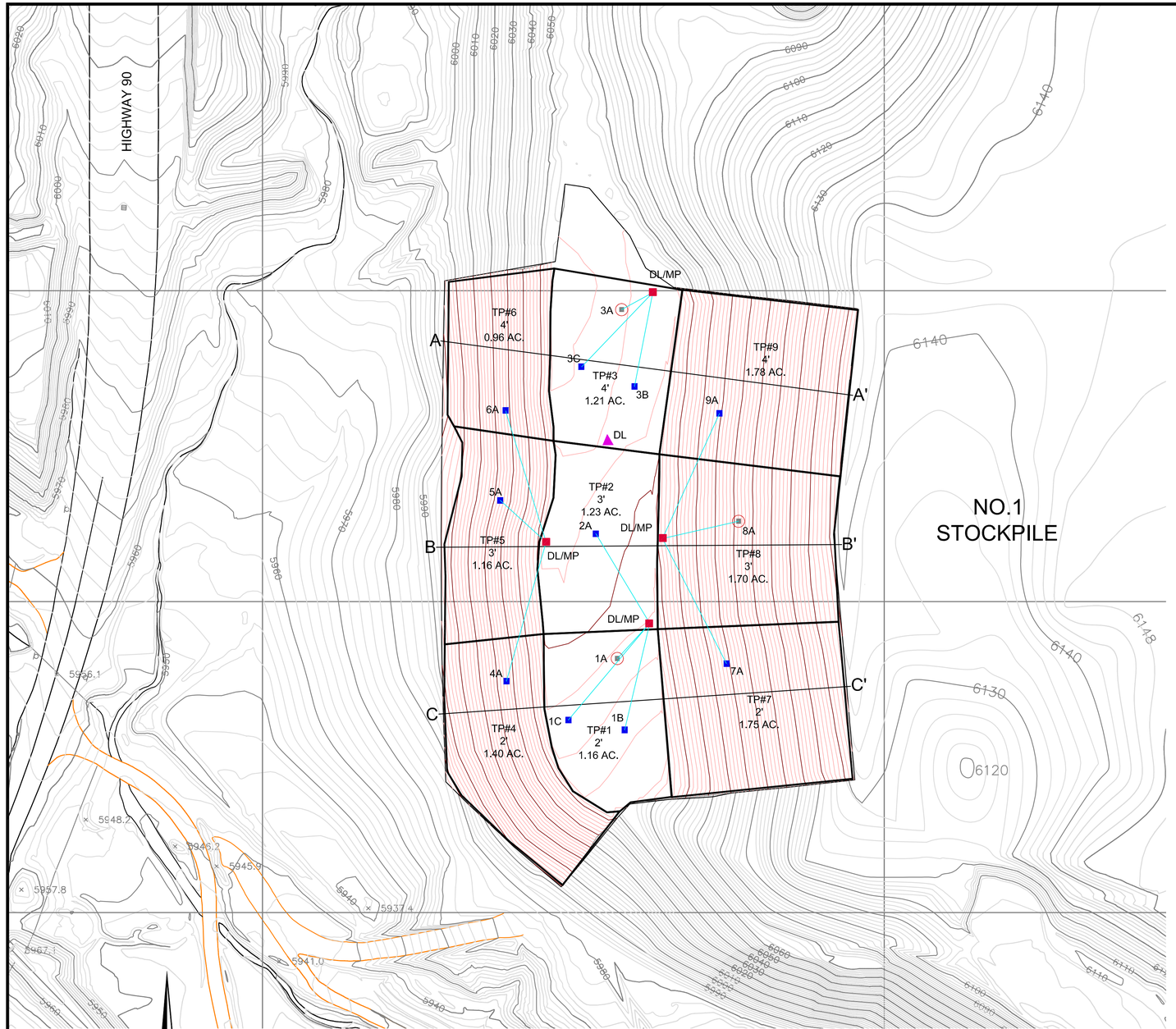
COVER THICKNESS ASSESSMENT – 3:1 TEST PLOTS
(MEAN +/- 95% CONFIDENCE INTERVAL)

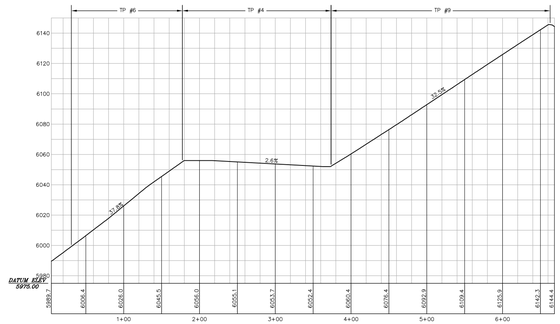
CLIENT/PROJ

PHELPS DODGE TYRONE, INC
AS-BUILT REPORT
NO. 1 STOCKPILE TEST PLOTS

DRAWN	DR	DATE	09/27/06	JOB NO.	053-2377
CHECKED	TS	SCALE	NA	**FIGURE 6**	
REVIEWED	LM	FILE	No. 1 AS-BUILT FIGURES		

PLATES

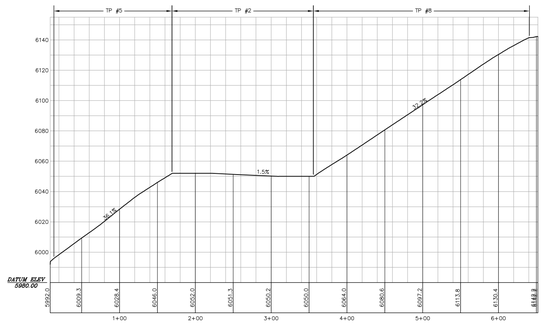




CROSS SECTION A-A'

100 0 100 200 FEET

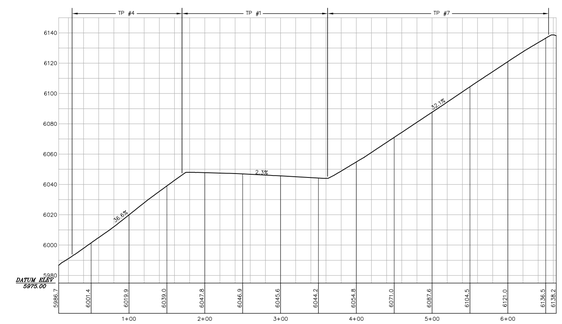
SCALE HORIZONTAL D SIZE: 1" = 100'
SCALE HORIZONTAL B SIZE: 1" = 200'
SCALE VERTICAL D SIZE: 1" = 50'
SCALE VERTICAL B SIZE: 1" = 100'



CROSS SECTION B-B'

100 0 100 200 FEET

SCALE HORIZONTAL D SIZE: 1" = 100'
SCALE HORIZONTAL B SIZE: 1" = 200'
SCALE VERTICAL D SIZE: 1" = 50'
SCALE VERTICAL B SIZE: 1" = 100'



CROSS SECTION C-C'

100 0 100 200 FEET

SCALE HORIZONTAL D SIZE: 1" = 100'
SCALE HORIZONTAL B SIZE: 1" = 200'
SCALE VERTICAL D SIZE: 1" = 50'
SCALE VERTICAL B SIZE: 1" = 100'

LEGEND

1A ■	INSTRUMENTATION NEST AND IDENTIFICATION NUMBER
3A ◉	VOLUMETRIC LYSIMETER INSTALLED BENEATH INSTRUMENTATION NEST WITH IDENTIFICATION NUMBER
DL/MP ■	DATA LOGGER / MULTIPLEXER
▲	WEATHER STATION
———	INSTRUMENTATION CABLE RUN (APPROXIMATE)
A———A'	CROSS SECTION LINE

100 0 100 200
SCALE D SIZE: 1" = 100'
SCALE B SIZE: 1" = 200'
FEET

PROJECT
PHELPS DODGE TYRONE INC.
NO.1 STOCKPILE TEST PLOTS
GRANT COUNTY, NEW MEXICO

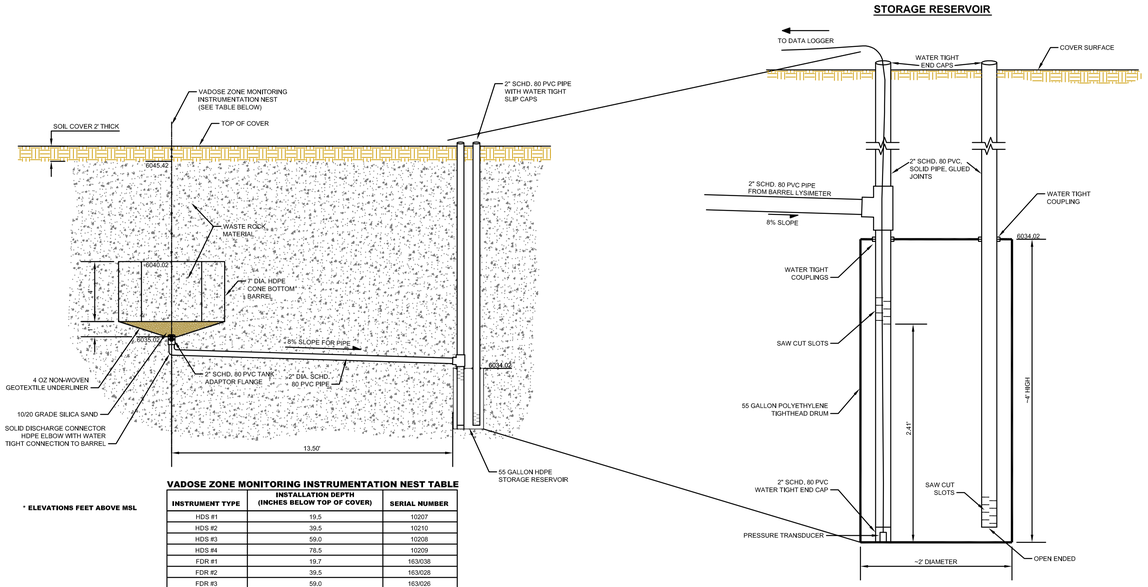
TITLE
INSTRUMENT NEST LOCATIONS & SLOPE PROFILES

Golder Associates
Albuquerque, New Mexico

PROJECT No.		053-2377	FILE No. No1 Stkp Instrument	
DESIGN	DR	09/26/06	SCALE AS SHOWN	REV. 0
CADD	CM	09/26/06		
CHECK	DR	09/26/06		
REVIEW	LM	09/29/06		

PLATE 1

Drawing File: No1 Stkp Instrument.dwg Sep 29, 2006 10:51:om



VADOSE ZONE MONITORING INSTRUMENTATION NEST TABLE

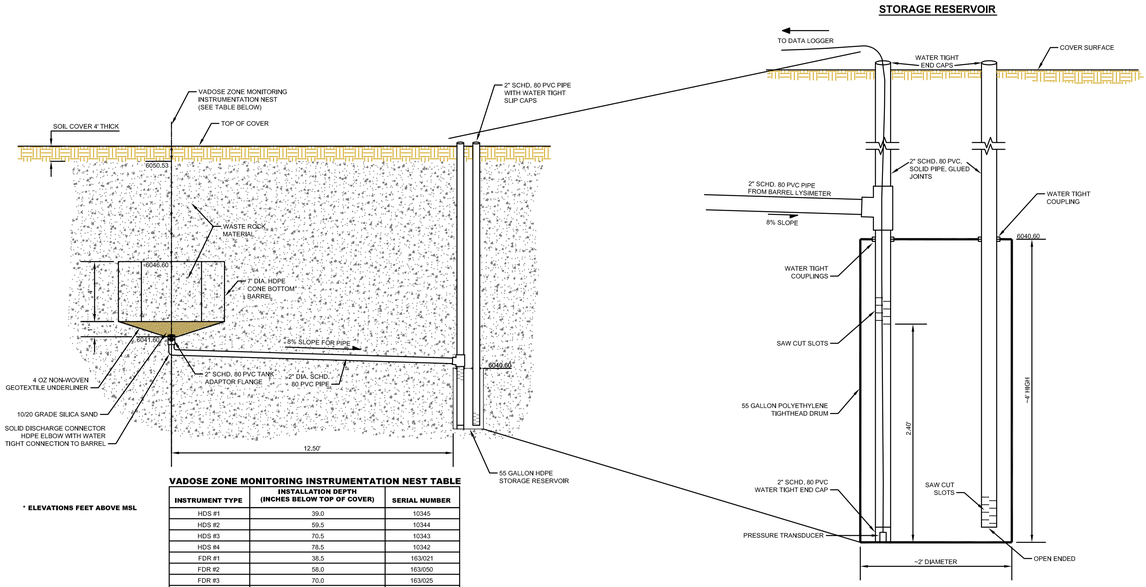
INSTRUMENT TYPE	INSTALLATION DEPTH (INCHES BELOW TOP OF COVER)	SERIAL NUMBER
HDS #1	19.5	10207
HDS #2	39.5	10210
HDS #3	59.0	10208
HDS #4	78.5	10209
FDR #1	19.7	163/038
FDR #2	39.5	163/028
FDR #3	59.0	163/026
FDR #4	79.0	163/035
GB #1	10.0	152494
PD #1	208.8	2107078

HDS = HEAT DISSIPATION SENSOR
FDR = FREQUENCY DOMAIN REFLECTOMETER
GB = GYPSUM BLOCK
PD = PRESSURE TRANSDUCER
NP = NEUTRON ACCESS TUBE

*** ELEVATIONS FEET ABOVE MSL**

LYSIMETER 1A TOP SURFACE 2' COVER TEST PLOT

NOT TO SCALE



VADOSE ZONE MONITORING INSTRUMENTATION NEST TABLE

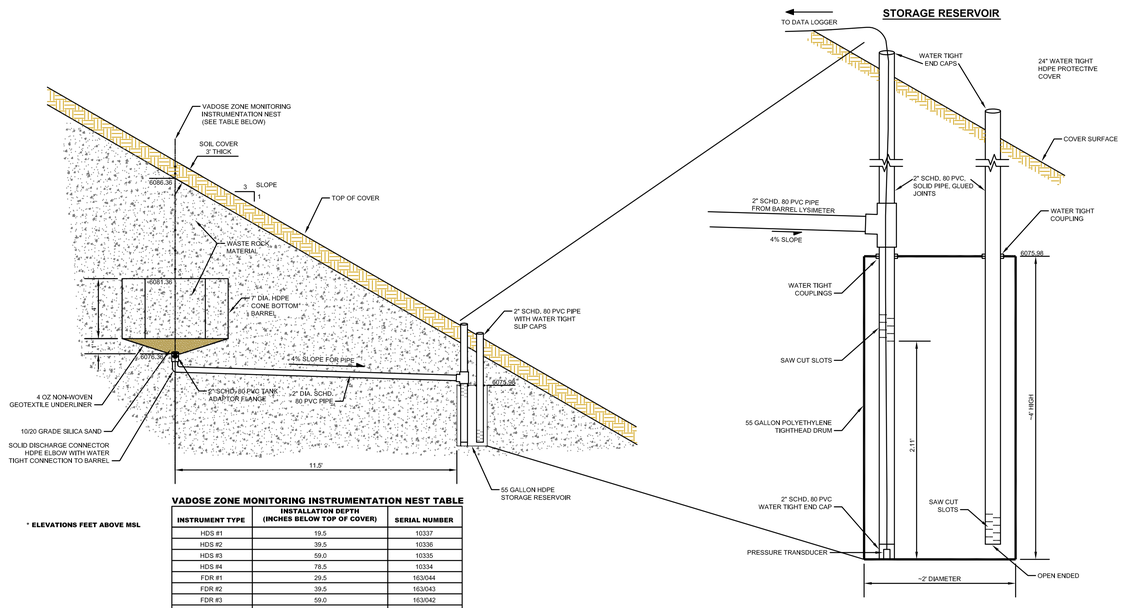
INSTRUMENT TYPE	INSTALLATION DEPTH (INCHES BELOW TOP OF COVER)	SERIAL NUMBER
HDS #1	39.0	10345
HDS #2	59.5	10344
HDS #3	70.5	10343
HDS #4	78.5	10342
FDR #1	38.5	163/021
FDR #2	58.0	163/050
FDR #3	70.0	163/025
FDR #4	78.5	163/030
GB #1	10.0	152478
PD #1	215.2	2148656

HDS = HEAT DISSIPATION SENSOR
FDR = FREQUENCY DOMAIN REFLECTOMETER
GB = GYPSUM BLOCK
PD = PRESSURE TRANSDUCER
NP = NEUTRON ACCESS TUBE

*** ELEVATIONS FEET ABOVE MSL**

LYSIMETER 3A TOP SURFACE 4' COVER TEST PLOT

NOT TO SCALE



VADOSE ZONE MONITORING INSTRUMENTATION NEST TABLE

INSTRUMENT TYPE	INSTALLATION DEPTH (INCHES BELOW TOP OF COVER)	SERIAL NUMBER
HDS #1	19.5	10337
HDS #2	39.5	10336
HDS #3	59.0	10335
HDS #4	78.5	10334
FDR #1	29.5	163/044
FDR #2	39.5	163/043
FDR #3	59.0	163/042
FDR #4	78.7	163/023
GB #1	10.0	152478
PD #1	208.6	2147084

HDS = HEAT DISSIPATION SENSOR
FDR = FREQUENCY DOMAIN REFLECTOMETER
GB = GYPSUM BLOCK
PD = PRESSURE TRANSDUCER
NP = NEUTRON ACCESS TUBE

*** ELEVATIONS FEET ABOVE MSL**

LYSIMETER 8A 3:1 SLOPE 3' COVER TEST PLOT

NOT TO SCALE

PROJECT

PHELPS DODGE TYRONE INC.
NO.1 STOCKPILE TEST PLOTS
GRANT COUNTY, NEW MEXICO

TITLE

BARREL LYSIMETER DETAILS

Golder Associates
Albuquerque, New Mexico

PROJECT No.		053-2377	FILE No\No1 Stkp Lysimeter-Dtl	
DESIGN	DR	09/26/06	SCALE AS SHOWN	REV. 0
CADD	CM	09/26/06	PLATE 2	
CHECK	DR	09/26/06		
REVIEW	LM	09/29/06		

Drawing File: No1 Stkp Lysimeter-Dtl.DWG Sep 29, 2006 - 10:38am

APPENDIX A

CHEMICAL AND PHYSICAL LABORATORY DATA
COVER MATERIALS

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

ANALYTICAL SUMMARY REPORT

December 14, 2005

Lewis Munk
Golder Associates Inc
4910 Alameda Blvd NE, Ste A
Albuquerque, NM 87113

Workorder No.: B05111051 Quote ID: B856 - 40 Soil/Rock Samples

Project Name: Tyrone No. 1 Test Plots, 053-2377

Energy Laboratories Inc received the following 84 samples from Golder Associates Inc on 11/15/2005 for analysis.

Sample ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
B05111051-001	No. 1 A-1, (0-12")	06/23/05 0:00	11/15/05	Soil	Coarse Fragments Conductivity Nitrate as N, KCL Extract Organic Carbon-Walkley/Black pH, Saturated Paste Phosphorus-Olsen Particle Size Analysis Saturation Percentage Texture
B05111051-002	No. 1 1A-2, (17-29")	06/23/05 0:00	11/15/05	Soil	Same As Above
B05111051-003	No. 1 1B-1, (0-12")	06/23/05 0:00	11/15/05	Soil	Same As Above
B05111051-004	No. 1 1B-2, (13-25")	06/23/05 0:00	11/15/05	Soil	Same As Above
B05111051-005	No. 1 1C-1, (0-12")	06/23/05 0:00	11/15/05	Soil	Same As Above
B05111051-006	No. 1 1C-2, (15-27")	06/23/05 0:00	11/15/05	Soil	Same As Above
B05111051-007	No. 1 1D-1, (0-12")	06/23/05 0:00	11/15/05	Soil	Same As Above
B05111051-008	No. 1 1D-2, (15-27")	06/23/05 0:00	11/15/05	Soil	Same As Above
B05111051-009	No. 1 1E-1, (0-12")	06/28/05 0:00	11/15/05	Soil	Same As Above
B05111051-010	No. 1 1E-2, (12-23")	06/28/05 0:00	11/15/05	Soil	Same As Above
B05111051-011	No. 1 2A-1, (0-12")	06/28/05 0:00	11/15/05	Soil	Same As Above
B05111051-012	No. 1 2A-2, (30-42")	06/28/05 0:00	11/15/05	Soil	Same As Above
B05111051-013	No. 1 2B-1, (0-12")	06/28/05 0:00	11/15/05	Soil	Same As Above
B05111051-014	No. 1 2B-2, (25-37")	06/28/05 0:00	11/15/05	Soil	Same As Above
B05111051-015	No. 1 2C-1, (0-12")	06/28/05 0:00	11/15/05	Soil	Same As Above
B05111051-016	No. 1 2C-2, (31-43")	06/28/05 0:00	11/15/05	Soil	Same As Above
B05111051-017	No. 1 2D-1, (0-12")	06/28/05 0:00	11/15/05	Soil	Same As Above
B05111051-018	No. 1 2D-2, (26-38")	06/28/05 0:00	11/15/05	Soil	Same As Above
B05111051-019	No. 1 2E-1, (0-12")	06/28/05 0:00	11/15/05	Soil	Same As Above

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B05111051-020	No. 1 2E-2, (30-42")	06/28/05 0:00	11/15/05	Soil	Same As Above
B05111051-021	No. 1 3A-1, (0-12")	06/28/05 0:00	11/15/05	Soil	Same As Above
B05111051-022	No. 1 3A-2, (43-55")	06/28/05 0:00	11/15/05	Soil	Same As Above
B05111051-023	No. 1 3B-1, (0-12")	06/28/05 0:00	11/15/05	Soil	Same As Above
B05111051-024	No. 1 3B-2, (36-48")	06/28/05 0:00	11/15/05	Soil	Same As Above
B05111051-025	No. 1 3C-1, (0-12")	06/28/05 0:00	11/15/05	Soil	Same As Above
B05111051-026	No. 1 3C-2, (41-53")	06/28/05 0:00	11/15/05	Soil	Same As Above
B05111051-027	No. 1 3D-1, (0-12")	06/28/05 0:00	11/15/05	Soil	Same As Above
B05111051-028	No. 1 3D-2, (39-51")	06/28/05 0:00	11/15/05	Soil	Same As Above
B05111051-029	No. 1 3E-1, (0-12")	06/28/05 0:00	11/15/05	Soil	Same As Above
B05111051-030	No. 1 3E-2, (40-52")	06/28/05 0:00	11/15/05	Soil	Same As Above
B05111051-031	No. 1 4A-1 (0-12")	08/02/05 0:00	11/15/05	Soil	Same As Above
B05111051-032	No. 1 4A-2, (21-33")	08/02/05 0:00	11/15/05	Soil	Same As Above
B05111051-033	No. 1 4B-1, (0-12")	08/02/05 0:00	11/15/05	Soil	Same As Above
B05111051-034	No. 1 4B-2, (7-19")	08/02/05 0:00	11/15/05	Soil	Same As Above
B05111051-035	No. 1 4C-1, (0-12")	08/02/05 0:00	11/15/05	Soil	Same As Above
B05111051-036	No. 1 4C-2, (15-27")	08/02/05 0:00	11/15/05	Soil	Same As Above
B05111051-037	No. 1 4D-1, (0-12")	08/02/05 0:00	11/15/05	Soil	Same As Above
B05111051-038	No. 1 4D-2, (8-20")	08/02/05 0:00	11/15/05	Soil	Same As Above
B05111051-039	No. 1 4E-1, (0-12")	08/02/05 0:00	11/15/05	Soil	Same As Above
B05111051-040	No. 1 4E-2, (10-22")	08/02/05 0:00	11/15/05	Soil	Same As Above
B05111051-041	No. 1 5A-1, (0-12")	08/03/05 0:00	11/15/05	Soil	Same As Above
B05111051-042	No. 1 5A-2, (34-46")	08/03/05 0:00	11/15/05	Soil	Same As Above
B05111051-043	No. 1 5B-1, (0-12")	08/03/05 0:00	11/15/05	Soil	Same As Above
B05111051-044	No. 1 5B-2, (29-41")	08/03/05 0:00	11/15/05	Soil	Same As Above
B05111051-045	No. 1 5C-1, (0-12")	08/03/05 0:00	11/15/05	Soil	Same As Above
B05111051-046	No. 1 5C-2, (22-34")	08/03/05 0:00	11/15/05	Soil	Same As Above
B05111051-047	No. 1 5D-1, (0-12")	08/03/05 0:00	11/15/05	Soil	Same As Above
B05111051-048	No. 1 5D-2, (27-39")	08/03/05 0:00	11/15/05	Soil	Same As Above
B05111051-049	No. 1 5E-1, (0-12")	08/03/05 0:00	11/15/05	Soil	Same As Above
B05111051-050	No. 1 5E-2 (20-32")	08/03/05 0:00	11/15/05	Soil	Same As Above
B05111051-051	No. 1 6A-1, (0-12")	08/03/05 0:00	11/15/05	Soil	Same As Above
B05111051-052	No. 1 6A-2, (37-49")	08/03/05 0:00	11/15/05	Soil	Same As Above
B05111051-053	No. 1 6B-1, (0-12")	08/03/05 0:00	11/15/05	Soil	Same As Above
B05111051-054	No. 1 6B-2	08/03/05 0:00	11/15/05	Soil	Same As Above

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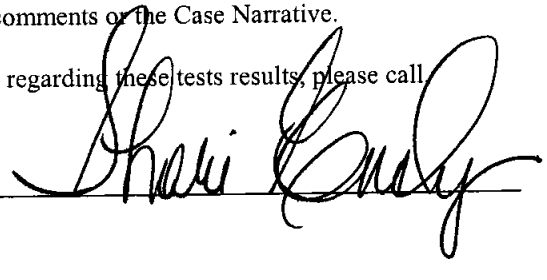
B05111051-055	No. 1 6C-1, (0-12")	08/03/05 0:00	11/15/05	Soil	Same As Above
B05111051-056	No. 1 6C-2, (44-56")	08/03/05 0:00	11/15/05	Soil	Same As Above
B05111051-057	No. 1 6D-1, (0-12")	08/03/05 0:00	11/15/05	Soil	Same As Above
B05111051-058	No. 1 6D-2, (38-50")	08/03/05 0:00	11/15/05	Soil	Same As Above
B05111051-059	No. 1 6E-1, (0-12")	08/03/05 0:00	11/15/05	Soil	Same As Above
B05111051-060	No. 1 6E-2, (46-58")	08/03/05 0:00	11/15/05	Soil	Same As Above
B05111051-061	No. 1 7A-1, (0-12")	07/21/05 0:00	11/15/05	Soil	Same As Above
B05111051-062	No. 1 7A-2, (17-29")	07/21/05 0:00	11/15/05	Soil	Same As Above
B05111051-063	No. 1 7B-1, (0-12")	07/21/05 0:00	11/15/05	Soil	Same As Above
B05111051-064	No. 1 7B-2, (13-25")	07/21/05 0:00	11/15/05	Soil	Same As Above
B05111051-065	No. 1 7C-1, (0-12")	07/21/05 0:00	11/15/05	Soil	Same As Above
B05111051-066	No. 1 7C-2, (16-28")	07/21/05 0:00	11/15/05	Soil	Same As Above
B05111051-067	No. 1 7D-1, (0-12")	07/21/05 0:00	11/15/05	Soil	Same As Above
B05111051-068	No. 1 7D-2, (15-27")	07/21/05 0:00	11/15/05	Soil	Same As Above
B05111051-069	No. 1 7E-1, (0-12")	07/21/05 0:00	11/15/05	Soil	Same As Above
B05111051-070	No. 1 7E-2, (12-24")	07/21/05 0:00	11/15/05	Soil	Same As Above
B05111051-071	No. 1 8A-1, (0-12")	08/02/05 0:00	11/15/05	Soil	Same As Above
B05111051-072	No. 1 8A-2, (26-38")	08/02/05 0:00	11/15/05	Soil	Same As Above
B05111051-073	No. 1 8B-1, (0-12")	08/02/05 0:00	11/15/05	Soil	Same As Above
B05111051-074	No. 1 8B-2, (25-37")	08/02/05 0:00	11/15/05	Soil	Same As Above
B05111051-075	No. 1 8C-1, (0-12")	08/02/05 0:00	11/15/05	Soil	Same As Above
B05111051-076	No. 1 8C-2, (35-47")	08/02/05 0:00	11/15/05	Soil	Same As Above
B05111051-077	No. 1 9A-2, (26-38")	08/02/05 0:00	11/15/05	Soil	Same As Above
B05111051-078	No. 1 9B-1, (0-12")	08/02/05 0:00	11/15/05	Soil	Same As Above
B05111051-079	No. 1 9C-1, (0-12")	08/02/05 0:00	11/15/05	Soil	Same As Above
B05111051-080	No. 1 9C-2, (35-47")	08/02/05 0:00	11/15/05	Soil	Same As Above
B05111051-081	No. 1 9D-1, (0-12")	08/02/05 0:00	11/15/05	Soil	Same As Above
B05111051-082	No. 1 9D-2, (35-47")	08/02/05 0:00	11/15/05	Soil	Same As Above
B05111051-083	No. 1 9E-1, (0-12")	08/02/05 0:00	11/15/05	Soil	Same As Above
B05111051-084	No. 1 9E-2, (42-54")	08/02/05 0:00	11/15/05	Soil	Same As Above

There were no problems with the analyses and all data for associated QC met EPA or laboratory specifications except if noted in report comments or the Case Narrative.

If you have any questions regarding these tests results, please call.

Report Approved By: 

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-001
Client Sample ID: No. 1 A-1, (0-12")

Report Date: 12/13/05
Collection Date: 06/23/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	56	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	73	%		1		ASA15-5	12/05/05 10:11 / srm
Silt	16	%		1		ASA15-5	12/05/05 10:11 / srm
Clay	11	%		1		ASA15-5	12/05/05 10:11 / srm
Texture	SL					ASA15-5	12/05/05 10:11 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.10	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	0.66	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	19.7	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.07	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	5	mg/kg		1		ASA24-5	12/02/05 11:52 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA33-8.1	12/02/05 16:30 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-002
Client Sample ID: No. 1 1A-2, (17-29")

Report Date: 12/13/05
Collection Date: 06/23/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	29	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	69	%		1		ASA15-5	12/05/05 10:11 / srm
Silt	12	%		1		ASA15-5	12/05/05 10:11 / srm
Clay	19	%		1		ASA15-5	12/05/05 10:11 / srm
Texture	SL					ASA15-5	12/05/05 10:11 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.40	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.76	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	26.7	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.17	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	3	mg/kg		1		ASA24-5	12/02/05 11:53 / srm
Nitrate as N, KCL Extract	3	mg/kg		1		ASA33-8.1	12/02/05 16:30 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-003
Client Sample ID: No. 1 1B-1, (0-12")

Report Date: 12/13/05
Collection Date: 06/23/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	49	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	79	%		1		ASA15-5	12/05/05 10:11 / srm
Silt	8	%		1		ASA15-5	12/05/05 10:11 / srm
Clay	13	%		1		ASA15-5	12/05/05 10:11 / srm
Texture	SL					ASA15-5	12/05/05 10:11 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	6.90	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	0.58	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	19.8	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.04	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	5	mg/kg		1		ASA24-5	12/02/05 11:55 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA33-8.1	12/02/05 16:31 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-004
Client Sample ID: No. 1 1B-2, (13-25")

Report Date: 12/13/05
Collection Date: 06/23/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	59	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	79	%		1		ASA15-5	12/05/05 10:11 / srm
Silt	10	%		1		ASA15-5	12/05/05 10:11 / srm
Clay	11	%		1		ASA15-5	12/05/05 10:11 / srm
Texture	SL					ASA15-5	12/05/05 10:11 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.20	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	0.59	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	21.5	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.04	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 11:56 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA33-8.1	12/02/05 16:32 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-005
Client Sample ID: No. 1 1C-1, (0-12")

Report Date: 12/13/05
Collection Date: 06/23/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	52	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	71	%		1		ASA15-5	12/05/05 10:11 / srm
Silt	14	%		1		ASA15-5	12/05/05 10:11 / srm
Clay	15	%		1		ASA15-5	12/05/05 10:11 / srm
Texture	SL					ASA15-5	12/05/05 10:11 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.20	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	0.92	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	22.9	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.17	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 11:58 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA33-8.1	12/02/05 16:33 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-006
Client Sample ID: No. 1 1C-2, (15-27")

Report Date: 12/13/05
Collection Date: 06/23/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	24	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	65	%		1		ASA15-5	12/05/05 10:11 / srm
Silt	12	%		1		ASA15-5	12/05/05 10:11 / srm
Clay	23	%		1		ASA15-5	12/05/05 10:11 / srm
Texture	SCL					ASA15-5	12/05/05 10:11 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.30	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	2.29	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	27.7	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.20	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	3	mg/kg		1		ASA24-5	12/02/05 11:59 / srm
Nitrate as N, KCL Extract	1	mg/kg		1		ASA33-8.1	12/02/05 16:33 / srm

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-007
Client Sample ID: No. 1 1D-1, (0-12")

Report Date: 12/13/05
Collection Date: 06/23/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	59	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	75	%		1		ASA15-5	12/05/05 10:11 / srm
Silt	13	%		1		ASA15-5	12/05/05 10:11 / srm
Clay	12	%		1		ASA15-5	12/05/05 10:11 / srm
Texture	SL					ASA15-5	12/05/05 10:11 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.20	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	0.86	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	21.1	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.06	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 12:01 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA33-8.1	12/02/05 16:34 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-008
Client Sample ID: No. 1 1D-2, (15-27")

Report Date: 12/13/05
Collection Date: 06/23/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	31	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	67	%		1		ASA15-5	12/05/05 10:11 / srm
Silt	12	%		1		ASA15-5	12/05/05 10:11 / srm
Clay	21	%		1		ASA15-5	12/05/05 10:11 / srm
Texture	SCL					ASA15-5	12/05/05 10:11 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.40	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	2.65	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	27.0	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.14	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 12:02 / srm
Nitrate as N, KCL Extract	2	mg/kg		1		ASA33-8.1	12/02/05 16:35 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-009
Client Sample ID: No. 1 1E-1, (0-12")

Report Date: 12/13/05
Collection Date: 06/28/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	61	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	69	%		1		ASA15-5	12/05/05 10:11 / srm
Silt	16	%		1		ASA15-5	12/05/05 10:11 / srm
Clay	15	%		1		ASA15-5	12/05/05 10:11 / srm
Texture	SL					ASA15-5	12/05/05 10:11 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	4.80	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	3.34	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	26.0	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.17	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	5	mg/kg		1		ASA24-5	12/02/05 12:03 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA33-8.1	12/02/05 16:35 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-010
Client Sample ID: No. 1 1E-2, (12-23")

Report Date: 12/13/05
Collection Date: 06/28/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	64	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	75	%		1		ASA15-5	12/05/05 10:11 / srm
Silt	10	%		1		ASA15-5	12/05/05 10:11 / srm
Clay	15	%		1		ASA15-5	12/05/05 10:11 / srm
Texture	SL					ASA15-5	12/05/05 10:11 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.00	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	0.68	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	24.4	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.07	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 12:10 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA33-8.1	12/02/05 16:37 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-011
Client Sample ID: No. 1 2A-1, (0-12")

Report Date: 12/13/05
Collection Date: 06/28/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	58	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	70	%		1		ASA15-5	12/05/05 10:11 / srm
Silt	15	%		1		ASA15-5	12/05/05 10:11 / srm
Clay	15	%		1		ASA15-5	12/05/05 10:11 / srm
Texture	SL					ASA15-5	12/05/05 10:11 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.10	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	0.80	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	24.1	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.15	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	5	mg/kg		1		ASA24-5	12/02/05 12:12 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA33-8.1	12/02/05 16:40 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-012
Client Sample ID: No. 1 2A-2, (30-42")

Report Date: 12/13/05
Collection Date: 06/28/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	30	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	67	%		1		ASA15-5	12/05/05 10:11 / srm
Silt	13	%		1		ASA15-5	12/05/05 10:11 / srm
Clay	20	%		1		ASA15-5	12/05/05 10:11 / srm
Texture	SCL					ASA15-5	12/05/05 10:11 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.20	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.82	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	26.9	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.18	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	3	mg/kg		1		ASA24-5	12/02/05 12:13 / srm
Nitrate as N, KCL Extract	7	mg/kg		1		ASA33-8.1	12/02/05 16:40 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-013
Client Sample ID: No. 1 2B-1, (0-12")

Report Date: 12/13/05
Collection Date: 06/28/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	60	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	75	%		1		ASA15-5	12/05/05 10:11 / srm
Silt	13	%		1		ASA15-5	12/05/05 10:11 / srm
Clay	12	%		1		ASA15-5	12/05/05 10:11 / srm
Texture	SL					ASA15-5	12/05/05 10:11 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.70	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	0.84	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	22.9	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.05	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 12:15 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA33-8.1	12/02/05 16:41 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-014
Client Sample ID: No. 1 2B-2, (25-37")

Report Date: 12/13/05
Collection Date: 06/28/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	61	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	75	%		1		ASA15-5	12/05/05 10:11 / srm
Silt	12	%		1		ASA15-5	12/05/05 10:11 / srm
Clay	13	%		1		ASA15-5	12/05/05 10:11 / srm
Texture	SL					ASA15-5	12/05/05 10:11 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.30	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	0.95	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	21.5	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.08	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 12:16 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA33-8.1	12/02/05 16:42 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-015
Client Sample ID: No. 1 2C-1, (0-12")

Report Date: 12/13/05
Collection Date: 06/28/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	59	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	71	%		1		ASA15-5	12/05/05 10:11 / srm
Silt	14	%		1		ASA15-5	12/05/05 10:11 / srm
Clay	15	%		1		ASA15-5	12/05/05 10:11 / srm
Texture	SL					ASA15-5	12/05/05 10:11 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.00	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.50	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	24.2	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.17	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 12:17 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA33-8.1	12/02/05 16:42 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-016
Client Sample ID: No. 1 2C-2, (31-43")

Report Date: 12/13/05
Collection Date: 06/28/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	22	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	55	%		1		ASA15-5	12/05/05 10:11 / srm
Silt	16	%		1		ASA15-5	12/05/05 10:11 / srm
Clay	29	%		1		ASA15-5	12/05/05 10:11 / srm
Texture	SCL					ASA15-5	12/05/05 10:11 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.20	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.60	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	29.4	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.31	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	3	mg/kg		1		ASA24-5	12/02/05 12:19 / srm
Nitrate as N, KCL Extract	2	mg/kg		1		ASA33-8.1	12/02/05 16:43 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-017
Client Sample ID: No. 1 2D-1, (0-12")

Report Date: 12/13/05
Collection Date: 06/28/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	27	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	67	%		1		ASA15-5	12/05/05 10:11 / srm
Silt	12	%		1		ASA15-5	12/05/05 10:11 / srm
Clay	21	%		1		ASA15-5	12/05/05 10:11 / srm
Texture	SCL					ASA15-5	12/05/05 10:11 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.00	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	2.50	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	23.2	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.17	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 12:20 / srm
Nitrate as N, KCL Extract	17	mg/kg		1		ASA33-8.1	12/02/05 16:44 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-018
Client Sample ID: No. 1 2D-2, (26-38")

Report Date: 12/13/05
Collection Date: 06/28/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	60	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	70	%		1		ASA15-5	12/05/05 10:11 / srm
Silt	15	%		1		ASA15-5	12/05/05 10:11 / srm
Clay	15	%		1		ASA15-5	12/05/05 10:11 / srm
Texture	SL					ASA15-5	12/05/05 10:11 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	6.20	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	0.78	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	22.9	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.15	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 12:22 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA33-8.1	12/02/05 16:45 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-019
Client Sample ID: No. 1 2E-1, (0-12")

Report Date: 12/13/05
Collection Date: 06/28/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	51	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	73	%		1		ASA15-5	12/05/05 10:11 / srm
Silt	12	%		1		ASA15-5	12/05/05 10:11 / srm
Clay	15	%		1		ASA15-5	12/05/05 10:11 / srm
Texture	SL					ASA15-5	12/05/05 10:11 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.10	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.41	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	22.5	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.11	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 12:23 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA33-8.1	12/02/05 16:45 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-020
Client Sample ID: No. 1 2E-2, (30-42")

Report Date: 12/13/05
Collection Date: 06/28/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	56	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	75	%		1		ASA15-5	12/05/05 10:11 / srm
Silt	16	%		1		ASA15-5	12/05/05 10:11 / srm
Clay	9	%		1		ASA15-5	12/05/05 10:11 / srm
Texture	SL					ASA15-5	12/05/05 10:11 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	6.90	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	0.65	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	20.0	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.06	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 12:30 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA33-8.1	12/02/05 16:47 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-021
Client Sample ID: No. 1 3A-1, (0-12")

Report Date: 12/13/05
Collection Date: 06/28/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	62	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	72	%		1		ASA15-5	12/05/05 10:11 / srm
Silt	17	%		1		ASA15-5	12/05/05 10:11 / srm
Clay	11	%		1		ASA15-5	12/05/05 10:11 / srm
Texture	SL					ASA15-5	12/05/05 10:11 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.20	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	0.83	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	20.9	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.10	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 12:32 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA33-8.1	12/02/05 16:47 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-022
Client Sample ID: No. 1 3A-2, (43-55")

Report Date: 12/13/05
Collection Date: 06/28/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	35	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	73	%		1		ASA15-5	12/05/05 10:11 / srm
Silt	9	%		1		ASA15-5	12/05/05 10:11 / srm
Clay	18	%		1		ASA15-5	12/05/05 10:11 / srm
Texture	SL					ASA15-5	12/05/05 10:11 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.40	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	2.58	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	19.0	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.08	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	3	mg/kg		1		ASA24-5	12/02/05 12:33 / srm
Nitrate as N, KCL Extract	1	mg/kg		1		ASA33-8.1	12/02/05 16:49 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-023
Client Sample ID: No. 1 3B-1, (0-12")

Report Date: 12/13/05
Collection Date: 06/28/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	60	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	71	%		1		ASA15-5	12/05/05 10:11 / srm
Silt	15	%		1		ASA15-5	12/05/05 10:11 / srm
Clay	14	%		1		ASA15-5	12/05/05 10:11 / srm
Texture	SL					ASA15-5	12/05/05 10:11 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.10	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.34	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	26.5	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.21	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 12:34 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA33-8.1	12/02/05 16:50 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-024
Client Sample ID: No. 1 3B-2, (36-48")

Report Date: 12/13/05
Collection Date: 06/28/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	51	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	70	%		1		ASA15-5	12/05/05 10:11 / srm
Silt	16	%		1		ASA15-5	12/05/05 10:11 / srm
Clay	14	%		1		ASA15-5	12/05/05 10:11 / srm
Texture	SL					ASA15-5	12/05/05 10:11 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.30	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.36	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	26.4	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.19	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 12:36 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA33-8.1	12/02/05 16:51 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-025
Client Sample ID: No. 1 3C-1, (0-12")

Report Date: 12/13/05
Collection Date: 06/28/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	60	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	73	%		1		ASA15-5	12/05/05 10:11 / srm
Silt	13	%		1		ASA15-5	12/05/05 10:11 / srm
Clay	14	%		1		ASA15-5	12/05/05 10:11 / srm
Texture	SL					ASA15-5	12/05/05 10:11 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.40	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.24	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	22.0	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.09	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 12:37 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA33-8.1	12/02/05 16:52 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-026
Client Sample ID: No. 1 3C-2, (41-53")

Report Date: 12/13/05
Collection Date: 06/28/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	46	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	68	%		1		ASA15-5	12/05/05 10:11 / srm
Silt	16	%		1		ASA15-5	12/05/05 10:11 / srm
Clay	16	%		1		ASA15-5	12/05/05 10:11 / srm
Texture	SL					ASA15-5	12/05/05 10:11 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.40	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.83	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	28.6	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.16	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	3	mg/kg		1		ASA24-5	12/02/05 12:39 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA33-8.1	12/02/05 16:52 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-027
Client Sample ID: No. 1 3D-1, (0-12")

Report Date: 12/13/05
Collection Date: 06/28/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	60	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	77	%		1		ASA15-5	12/05/05 10:11 / srm
Silt	11	%		1		ASA15-5	12/05/05 10:11 / srm
Clay	12	%		1		ASA15-5	12/05/05 10:11 / srm
Texture	SL					ASA15-5	12/05/05 10:11 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.20	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.38	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	23.2	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.12	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 12:40 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA33-8.1	12/02/05 16:53 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-028
Client Sample ID: No. 1 3D-2, (39-51")

Report Date: 12/13/05
Collection Date: 06/28/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	41	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	35	%		1		ASA15-5	12/05/05 10:11 / srm
Silt	23	%		1		ASA15-5	12/05/05 10:11 / srm
Clay	42	%		1		ASA15-5	12/05/05 10:11 / srm
Texture	C					ASA15-5	12/05/05 10:11 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	6.10	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	2.16	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	50.5	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.66	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	3	mg/kg		1		ASA24-5	12/02/05 12:41 / srm
Nitrate as N, KCL Extract	100	mg/kg		1		ASA33-8.1	12/02/05 19:23 / srm

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-029
Client Sample ID: No. 1 3E-1, (0-12")

Report Date: 12/13/05
Collection Date: 06/28/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	61	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	72	%		1		ASA15-5	12/05/05 10:11 / srm
Silt	16	%		1		ASA15-5	12/05/05 10:11 / srm
Clay	12	%		1		ASA15-5	12/05/05 10:11 / srm
Texture	SL					ASA15-5	12/05/05 10:11 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.30	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.29	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	22.7	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.16	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 12:43 / srm
Nitrate as N, KCL Extract	1	mg/kg		1		ASA33-8.1	12/02/05 19:23 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-030
Client Sample ID: No. 1 3E-2, (40-52")

Report Date: 12/13/05
Collection Date: 06/28/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	54	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	78	%		1		ASA15-5	12/05/05 10:11 / srm
Silt	12	%		1		ASA15-5	12/05/05 10:11 / srm
Clay	10	%		1		ASA15-5	12/05/05 10:11 / srm
Texture	SL					ASA15-5	12/05/05 10:11 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.10	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	0.42	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	20.7	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.08	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 12:50 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA33-8.1	12/02/05 16:57 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-031
Client Sample ID: No. 1 4A-1 (0-12")

Report Date: 12/13/05
Collection Date: 08/02/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	47	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	70	%		1		ASA15-5	12/05/05 10:11 / srm
Silt	17	%		1		ASA15-5	12/05/05 10:11 / srm
Clay	13	%		1		ASA15-5	12/05/05 10:11 / srm
Texture	SL					ASA15-5	12/05/05 10:11 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.40	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.52	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	25.5	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.19	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 12:51 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA33-8.1	12/02/05 16:57 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-032
Client Sample ID: No. 1 4A-2, (21-33")

Report Date: 12/13/05
Collection Date: 08/02/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	MCL/ RL QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS						
Coarse Fragments	49	wt%		2	ASA15-5	11/30/05 15:29 / srm
Sand	77	%		1	ASA15-5	12/05/05 10:11 / srm
Silt	11	%		1	ASA15-5	12/05/05 10:11 / srm
Clay	12	%		1	ASA15-5	12/05/05 10:11 / srm
Texture	SL				ASA15-5	12/05/05 10:11 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)						
SATURATED PASTE						
pH, sat. paste	7.60	s.u.		0.10	ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.04	mmhos/cm		0.01	ASA10-3	12/05/05 10:11 / srm
Saturation	21.8	%		0.1	USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS						
Organic Carbon	0.10	wt%		0.02	ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1	ASA24-5	12/02/05 12:53 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1	ASA33-8.1	12/02/05 16:59 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-033
Client Sample ID: No. 1 4B-1, (0-12")

Report Date: 12/13/05
Collection Date: 08/02/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	47	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	74	%		1		ASA15-5	12/05/05 10:11 / srm
Silt	10	%		1		ASA15-5	12/05/05 10:11 / srm
Clay	16	%		1		ASA15-5	12/05/05 10:11 / srm
Texture	SL					ASA15-5	12/05/05 10:11 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.50	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	2.31	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	26.5	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.18	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 12:54 / srm
Nitrate as N, KCL Extract	1	mg/kg		1		ASA33-8.1	12/02/05 17:00 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-034
Client Sample ID: No. 1 4B-2, (7-19")

Report Date: 12/13/05
Collection Date: 08/02/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	50	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	72	%		1		ASA15-5	12/05/05 10:11 / srm
Silt	10	%		1		ASA15-5	12/05/05 10:11 / srm
Clay	18	%		1		ASA15-5	12/05/05 10:11 / srm
Texture	SL					ASA15-5	12/05/05 10:11 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.20	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	3.11	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	27.9	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.13	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 12:56 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA33-8.1	12/02/05 17:01 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-035
Client Sample ID: No. 1 4C-1, (0-12")

Report Date: 12/13/05
Collection Date: 08/02/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	60	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	76	%		1		ASA15-5	12/05/05 10:11 / srm
Silt	13	%		1		ASA15-5	12/05/05 10:11 / srm
Clay	11	%		1		ASA15-5	12/05/05 10:11 / srm
Texture	SL					ASA15-5	12/05/05 10:11 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.60	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	0.98	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	22.2	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.07	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 12:57 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA33-8.1	12/02/05 17:01 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-036
Client Sample ID: No. 1 4C-2, (15-27")

Report Date: 12/13/05
Collection Date: 08/02/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	61	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	76	%		1		ASA15-5	12/05/05 10:11 / srm
Silt	13	%		1		ASA15-5	12/05/05 10:11 / srm
Clay	11	%		1		ASA15-5	12/05/05 10:11 / srm
Texture	SL					ASA15-5	12/05/05 10:11 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.50	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	0.65	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	20.9	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.05	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 12:58 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA33-8.1	12/02/05 17:02 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-037
Client Sample ID: No. 1 4D-1, (0-12")

Report Date: 12/13/05
Collection Date: 08/02/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	55	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	76	%		1		ASA15-5	12/05/05 10:11 / srm
Silt	11	%		1		ASA15-5	12/05/05 10:11 / srm
Clay	13	%		1		ASA15-5	12/05/05 10:11 / srm
Texture	SL					ASA15-5	12/05/05 10:11 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.60	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.04	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	24.1	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.11	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	5	mg/kg		1		ASA24-5	12/02/05 13:00 / srm
Nitrate as N, KCL Extract	1	mg/kg		1		ASA33-8.1	12/02/05 17:03 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-038
Client Sample ID: No. 1 4D-2, (8-20")

Report Date: 12/13/05
Collection Date: 08/02/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	54	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	76	%		1		ASA15-5	12/05/05 10:11 / srm
Silt	10	%		1		ASA15-5	12/05/05 10:11 / srm
Clay	14	%		1		ASA15-5	12/05/05 10:11 / srm
Texture	SL					ASA15-5	12/05/05 10:11 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.50	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.68	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	22.7	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.09	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 13:01 / srm
Nitrate as N, KCL Extract	1	mg/kg		1		ASA33-8.1	12/02/05 17:04 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-039
Client Sample ID: No. 1 4E-1, (0-12")

Report Date: 12/13/05
Collection Date: 08/02/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	55	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	70	%		1		ASA15-5	12/05/05 10:11 / srm
Silt	17	%		1		ASA15-5	12/05/05 10:11 / srm
Clay	13	%		1		ASA15-5	12/05/05 10:11 / srm
Texture	SL					ASA15-5	12/05/05 10:11 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.40	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.26	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	24.6	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.24	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 13:03 / srm
Nitrate as N, KCL Extract	1	mg/kg		1		ASA33-8.1	12/02/05 17:04 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-040
Client Sample ID: No. 1 4E-2, (10-22")

Report Date: 12/13/05
Collection Date: 08/02/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	53	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	68	%		1		ASA15-5	12/05/05 10:11 / srm
Silt	14	%		1		ASA15-5	12/05/05 10:11 / srm
Clay	18	%		1		ASA15-5	12/05/05 10:11 / srm
Texture	SL					ASA15-5	12/05/05 10:11 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.30	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.96	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	27.0	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.15	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	3	mg/kg		1		ASA24-5	12/02/05 13:10 / srm
Nitrate as N, KCL Extract	1	mg/kg		1		ASA33-8.1	12/02/05 17:06 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-041
Client Sample ID: No. 1 5A-1, (0-12")

Report Date: 12/13/05
Collection Date: 08/03/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	53	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	72	%		1		ASA15-5	12/05/05 10:11 / srm
Silt	12	%		1		ASA15-5	12/05/05 10:11 / srm
Clay	16	%		1		ASA15-5	12/05/05 10:11 / srm
Texture	SL					ASA15-5	12/05/05 10:11 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.50	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.54	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	24.9	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.12	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 13:11 / srm
Nitrate as N, KCL Extract	1	mg/kg		1		ASA33-8.1	12/02/05 17:06 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-042
Client Sample ID: No. 1 5A-2, (34-46")

Report Date: 12/13/05
Collection Date: 08/03/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	53	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	70	%		1		ASA15-5	12/05/05 10:11 / srm
Silt	14	%		1		ASA15-5	12/05/05 10:11 / srm
Clay	16	%		1		ASA15-5	12/05/05 10:11 / srm
Texture	SL					ASA15-5	12/05/05 10:11 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.50	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.31	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	23.9	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.16	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	5	mg/kg		1		ASA24-5	12/02/05 13:13 / srm
Nitrate as N, KCL Extract	1	mg/kg		1		ASA33-8.1	12/02/05 17:07 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-043
Client Sample ID: No. 1 5B-1, (0-12")

Report Date: 12/13/05
Collection Date: 08/03/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	53	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	72	%		1		ASA15-5	12/05/05 10:11 / srm
Silt	14	%		1		ASA15-5	12/05/05 10:11 / srm
Clay	14	%		1		ASA15-5	12/05/05 10:11 / srm
Texture	SL					ASA15-5	12/05/05 10:11 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.50	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.21	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	23.1	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.12	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 13:14 / srm
Nitrate as N, KCL Extract	1	mg/kg		1		ASA33-8.1	12/02/05 17:09 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-044
Client Sample ID: No. 1 5B-2, (29-41")

Report Date: 12/13/05
Collection Date: 08/03/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	38	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	72	%		1		ASA15-5	12/05/05 10:11 / srm
Silt	11	%		1		ASA15-5	12/05/05 10:11 / srm
Clay	17	%		1		ASA15-5	12/05/05 10:11 / srm
Texture	SL					ASA15-5	12/05/05 10:11 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.30	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.81	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	26.1	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.16	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 13:15 / srm
Nitrate as N, KCL Extract	2	mg/kg		1		ASA33-8.1	12/02/05 17:10 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-045
Client Sample ID: No. 1 5C-1, (0-12")

Report Date: 12/13/05
Collection Date: 08/03/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	55	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	74	%		1		ASA15-5	12/05/05 10:11 / srm
Silt	12	%		1		ASA15-5	12/05/05 10:11 / srm
Clay	14	%		1		ASA15-5	12/05/05 10:11 / srm
Texture	SL					ASA15-5	12/05/05 10:11 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.40	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.32	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	25.1	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.14	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 13:17 / srm
Nitrate as N, KCL Extract	1	mg/kg		1		ASA33-8.1	12/02/05 17:11 / srm

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-046
Client Sample ID: No. 1 5C-2, (22-34")

Report Date: 12/13/05
Collection Date: 08/03/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	51	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	68	%		1		ASA15-5	12/05/05 10:11 / srm
Silt	18	%		1		ASA15-5	12/05/05 10:11 / srm
Clay	14	%		1		ASA15-5	12/05/05 10:11 / srm
Texture	SL					ASA15-5	12/05/05 10:11 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.40	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.42	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	25.7	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.15	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 13:18 / srm
Nitrate as N, KCL Extract	1	mg/kg		1		ASA33-8.1	12/02/05 17:11 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-047
Client Sample ID: No. 1 5D-1, (0-12")

Report Date: 12/13/05
Collection Date: 08/03/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	55	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	72	%		1		ASA15-5	12/05/05 10:11 / srm
Silt	15	%		1		ASA15-5	12/05/05 10:11 / srm
Clay	13	%		1		ASA15-5	12/05/05 10:11 / srm
Texture	SL					ASA15-5	12/05/05 10:11 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.40	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.45	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	23.2	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.16	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	5	mg/kg		1		ASA24-5	12/02/05 13:20 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA33-8.1	12/02/05 17:12 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-048
Client Sample ID: No. 1 5D-2, (27-39")

Report Date: 12/13/05
Collection Date: 08/03/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	53	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	72	%		1		ASA15-5	12/05/05 10:11 / srm
Silt	14	%		1		ASA15-5	12/05/05 10:11 / srm
Clay	14	%		1		ASA15-5	12/05/05 10:11 / srm
Texture	SL					ASA15-5	12/05/05 10:11 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.40	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.18	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	24.0	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.15	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 13:21 / srm
Nitrate as N, KCL Extract	1	mg/kg		1		ASA33-8.1	12/02/05 17:13 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-049
Client Sample ID: No. 1 5E-1, (0-12")

Report Date: 12/13/05
Collection Date: 08/03/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	54	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	74	%		1		ASA15-5	12/05/05 10:11 / srm
Silt	14	%		1		ASA15-5	12/05/05 10:11 / srm
Clay	12	%		1		ASA15-5	12/05/05 10:11 / srm
Texture	SL					ASA15-5	12/05/05 10:11 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.30	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.34	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	23.3	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.15	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 13:22 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA33-8.1	12/02/05 17:13 / srm

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-050
Client Sample ID: No. 1 5E-2 (20-32")

Report Date: 12/13/05
Collection Date: 08/03/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	56	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	72	%		1		ASA15-5	12/05/05 10:11 / srm
Silt	16	%		1		ASA15-5	12/05/05 10:11 / srm
Clay	12	%		1		ASA15-5	12/05/05 10:11 / srm
Texture	SL					ASA15-5	12/05/05 10:11 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.80	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.21	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	23.3	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.13	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 13:29 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA33-8.1	12/02/05 17:16 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-051
Client Sample ID: No. 1 6A-1, (0-12")

Report Date: 12/13/05
Collection Date: 08/03/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	53	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	74	%		1		ASA15-5	12/05/05 10:11 / srm
Silt	15	%		1		ASA15-5	12/05/05 10:11 / srm
Clay	11	%		1		ASA15-5	12/05/05 10:11 / srm
Texture	SL					ASA15-5	12/05/05 10:11 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.50	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.24	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	23.4	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.15	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 13:31 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA33-8.1	12/02/05 17:16 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-052
Client Sample ID: No. 1 6A-2, (37-49")

Report Date: 12/13/05
Collection Date: 08/03/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	49	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	75	%		1		ASA15-5	12/05/05 10:11 / srm
Silt	13	%		1		ASA15-5	12/05/05 10:11 / srm
Clay	12	%		1		ASA15-5	12/05/05 10:11 / srm
Texture	SL					ASA15-5	12/05/05 10:11 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.70	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.54	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	24.4	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.11	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 13:32 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA33-8.1	12/02/05 17:17 / srm

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-053
Client Sample ID: No. 1 6B-1, (0-12")

Report Date: 12/13/05
Collection Date: 08/03/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	54	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	73	%		1		ASA15-5	12/05/05 10:11 / srm
Silt	15	%		1		ASA15-5	12/05/05 10:11 / srm
Clay	12	%		1		ASA15-5	12/05/05 10:11 / srm
Texture	SL					ASA15-5	12/05/05 10:11 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.60	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.12	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	22.2	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.20	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 13:34 / srm
Nitrate as N, KCL Extract	1	mg/kg		1		ASA33-8.1	12/02/05 17:19 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-054
Client Sample ID: No. 1 6B-2

Report Date: 12/13/05
Collection Date: 08/03/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	62	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	76	%		1		ASA15-5	12/05/05 10:11 / srm
Silt	14	%		1		ASA15-5	12/05/05 10:11 / srm
Clay	10	%		1		ASA15-5	12/05/05 10:11 / srm
Texture	SL					ASA15-5	12/05/05 10:11 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.10	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	0.86	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	21.4	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.07	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 13:35 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA33-8.1	12/02/05 17:20 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-055
Client Sample ID: No. 1 6C-1, (0-12")

Report Date: 12/13/05
Collection Date: 08/03/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	53	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	68	%		1		ASA15-5	12/07/05 17:56 / srm
Silt	16	%		1		ASA15-5	12/07/05 17:56 / srm
Clay	16	%		1		ASA15-5	12/07/05 17:56 / srm
Texture	SL					ASA15-5	12/07/05 17:56 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.40	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.26	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	27.6	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.31	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	3	mg/kg		1		ASA24-5	12/02/05 13:37 / srm
Nitrate as N, KCL Extract	2	mg/kg		1		ASA33-8.1	12/02/05 17:21 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-056
Client Sample ID: No. 1 6C-2, (44-56")

Report Date: 12/13/05
Collection Date: 08/03/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	53	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	72	%		1		ASA15-5	12/07/05 17:56 / srm
Silt	15	%		1		ASA15-5	12/07/05 17:56 / srm
Clay	13	%		1		ASA15-5	12/07/05 17:56 / srm
Texture	SL					ASA15-5	12/07/05 17:56 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.60	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.87	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	25.1	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.13	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 13:38 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA33-8.1	12/02/05 17:21 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-057
Client Sample ID: No. 1 6D-1, (0-12")

Report Date: 12/13/05
Collection Date: 08/03/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	51	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	70	%		1		ASA15-5	12/07/05 17:56 / srm
Silt	17	%		1		ASA15-5	12/07/05 17:56 / srm
Clay	13	%		1		ASA15-5	12/07/05 17:56 / srm
Texture	SL					ASA15-5	12/07/05 17:56 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.80	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.58	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	24.1	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.12	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 13:39 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA33-8.1	12/02/05 17:22 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-058
Client Sample ID: No. 1 6D-2, (38-50")

Report Date: 12/13/05
Collection Date: 08/03/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	50	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	74	%		1		ASA15-5	12/07/05 17:56 / srm
Silt	14	%		1		ASA15-5	12/07/05 17:56 / srm
Clay	12	%		1		ASA15-5	12/07/05 17:56 / srm
Texture	SL					ASA15-5	12/07/05 17:56 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.70	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.43	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	22.8	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.06	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 13:41 / srm
Nitrate as N, KCL Extract	1	mg/kg		1		ASA33-8.1	12/02/05 17:23 / srm

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-059
Client Sample ID: No. 1 6E-1, (0-12")

Report Date: 12/13/05
Collection Date: 08/03/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	49	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	70	%		1		ASA15-5	12/07/05 17:56 / srm
Silt	16	%		1		ASA15-5	12/07/05 17:56 / srm
Clay	14	%		1		ASA15-5	12/07/05 17:56 / srm
Texture	SL					ASA15-5	12/07/05 17:56 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.60	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.59	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	22.6	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.20	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 13:42 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA33-8.1	12/02/05 17:23 / srm

Report Definitions: RL - Analyte reporting limit. QCL - Quality control limit. MCL - Maximum contaminant level. ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-060
Client Sample ID: No. 1 6E-2, (46-58")

Report Date: 12/13/05
Collection Date: 08/03/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	33	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	74	%		1		ASA15-5	12/07/05 17:56 / srm
Silt	9	%		1		ASA15-5	12/07/05 17:56 / srm
Clay	17	%		1		ASA15-5	12/07/05 17:56 / srm
Texture	SL					ASA15-5	12/07/05 17:56 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.50	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	2.34	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	25.5	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.15	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 13:55 / srm
Nitrate as N, KCL Extract	3	mg/kg		1		ASA33-8.1	12/02/05 17:25 / srm

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-061
Client Sample ID: No. 1 7A-1, (0-12")

Report Date: 12/13/05
Collection Date: 07/21/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	50	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	68	%		1		ASA15-5	12/07/05 17:56 / srm
Silt	18	%		1		ASA15-5	12/07/05 17:56 / srm
Clay	14	%		1		ASA15-5	12/07/05 17:56 / srm
Texture	SL					ASA15-5	12/07/05 17:56 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.50	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.36	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	25.2	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.32	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 13:56 / srm
Nitrate as N, KCL Extract	2	mg/kg		1		ASA33-8.1	12/02/05 17:25 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-062
Client Sample ID: No. 1 7A-2, (17-29")

Report Date: 12/13/05
Collection Date: 07/21/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	49	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	72	%		1		ASA15-5	12/07/05 17:56 / srm
Silt	14	%		1		ASA15-5	12/07/05 17:56 / srm
Clay	14	%		1		ASA15-5	12/07/05 17:56 / srm
Texture	SL					ASA15-5	12/07/05 17:56 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	6.70	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.18	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	26.0	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.24	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	3	mg/kg		1		ASA24-5	12/02/05 13:58 / srm
Nitrate as N, KCL Extract	1	mg/kg		1		ASA33-8.1	12/02/05 17:26 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-063
Client Sample ID: No. 1 7B-1, (0-12")

Report Date: 12/13/05
Collection Date: 07/21/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	55	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	69	%		1		ASA15-5	12/07/05 17:56 / srm
Silt	17	%		1		ASA15-5	12/07/05 17:56 / srm
Clay	14	%		1		ASA15-5	12/07/05 17:56 / srm
Texture	SL					ASA15-5	12/07/05 17:56 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.40	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	2.19	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	24.3	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.22	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 13:59 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA33-8.1	12/02/05 17:27 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-064
Client Sample ID: No. 1 7B-2, (13-25")

Report Date: 12/13/05
Collection Date: 07/21/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	49	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	70	%		1		ASA15-5	12/07/05 17:56 / srm
Silt	15	%		1		ASA15-5	12/07/05 17:56 / srm
Clay	15	%		1		ASA15-5	12/07/05 17:56 / srm
Texture	SL					ASA15-5	12/07/05 17:56 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.50	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.02	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	27.0	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.19	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	3	mg/kg		1		ASA24-5	12/02/05 14:00 / srm
Nitrate as N, KCL Extract	2	mg/kg		1		ASA33-8.1	12/02/05 17:57 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-065
Client Sample ID: No. 1 7C-1, (0-12")

Report Date: 12/13/05
Collection Date: 07/21/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	55	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	70	%		1		ASA15-5	12/07/05 17:56 / srm
Silt	16	%		1		ASA15-5	12/07/05 17:56 / srm
Clay	14	%		1		ASA15-5	12/07/05 17:56 / srm
Texture	SL					ASA15-5	12/07/05 17:56 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.50	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.48	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	24.4	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.21	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 14:02 / srm
Nitrate as N, KCL Extract	1	mg/kg		1		ASA33-8.1	12/02/05 17:57 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-066
Client Sample ID: No. 1 7C-2, (16-28")

Report Date: 12/13/05
Collection Date: 07/21/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	53	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	70	%		1		ASA15-5	12/07/05 17:56 / srm
Silt	16	%		1		ASA15-5	12/07/05 17:56 / srm
Clay	14	%		1		ASA15-5	12/07/05 17:56 / srm
Texture	SL					ASA15-5	12/07/05 17:56 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.70	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	0.90	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	23.9	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.13	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 14:03 / srm
Nitrate as N, KCL Extract	1	mg/kg		1		ASA33-8.1	12/02/05 17:58 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-067
Client Sample ID: No. 1 7D-1, (0-12")

Report Date: 12/13/05
Collection Date: 07/21/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	56	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	72	%		1		ASA15-5	12/07/05 17:56 / srm
Silt	16	%		1		ASA15-5	12/07/05 17:56 / srm
Clay	12	%		1		ASA15-5	12/07/05 17:56 / srm
Texture	SL					ASA15-5	12/07/05 17:56 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.50	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.25	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	23.0	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.10	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 14:05 / srm
Nitrate as N, KCL Extract	1	mg/kg		1		ASA33-8.1	12/02/05 17:59 / srm

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-068
Client Sample ID: No. 1 7D-2, (15-27")

Report Date: 12/13/05
Collection Date: 07/21/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	63	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	76	%		1		ASA15-5	12/07/05 17:56 / srm
Silt	12	%		1		ASA15-5	12/07/05 17:56 / srm
Clay	12	%		1		ASA15-5	12/07/05 17:56 / srm
Texture	SL					ASA15-5	12/07/05 17:56 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.70	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.07	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	22.1	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.05	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 14:06 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA33-8.1	12/02/05 17:59 / srm

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-069
Client Sample ID: No. 1 7E-1, (0-12")

Report Date: 12/13/05
Collection Date: 07/21/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	51	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	70	%		1		ASA15-5	12/07/05 17:56 / srm
Silt	16	%		1		ASA15-5	12/07/05 17:56 / srm
Clay	14	%		1		ASA15-5	12/07/05 17:56 / srm
Texture	SL					ASA15-5	12/07/05 17:56 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	6.00	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	0.70	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	23.0	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.25	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 14:07 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA33-8.1	12/02/05 18:00 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-070
Client Sample ID: No. 1 7E-2, (12-24")

Report Date: 12/13/05
Collection Date: 07/21/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	54	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	74	%		1		ASA15-5	12/07/05 17:56 / srm
Silt	14	%		1		ASA15-5	12/07/05 17:56 / srm
Clay	12	%		1		ASA15-5	12/07/05 17:56 / srm
Texture	SL					ASA15-5	12/07/05 17:56 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	6.70	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.02	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	23.8	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.15	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 14:14 / srm
Nitrate as N, KCL Extract	1	mg/kg		1		ASA33-8.1	12/02/05 18:02 / srm

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-071
Client Sample ID: No. 1 8A-1, (0-12")

Report Date: 12/13/05
Collection Date: 08/02/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	50	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	70	%		1		ASA15-5	12/07/05 17:56 / srm
Silt	18	%		1		ASA15-5	12/07/05 17:56 / srm
Clay	12	%		1		ASA15-5	12/07/05 17:56 / srm
Texture	SL					ASA15-5	12/07/05 17:56 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.70	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.08	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	25.2	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.15	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 14:16 / srm
Nitrate as N, KCL Extract	2	mg/kg		1		ASA33-8.1	12/02/05 18:03 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-072
Client Sample ID: No. 1 8A-2, (26-38")

Report Date: 12/13/05
Collection Date: 08/02/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	45	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	72	%		1		ASA15-5	12/07/05 17:56 / srm
Silt	15	%		1		ASA15-5	12/07/05 17:56 / srm
Clay	13	%		1		ASA15-5	12/07/05 17:56 / srm
Texture	SL					ASA15-5	12/07/05 17:56 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.60	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.29	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	22.7	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.14	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 14:17 / srm
Nitrate as N, KCL Extract	2	mg/kg		1		ASA33-8.1	12/02/05 18:04 / srm

Report Definitions: RL - Analyte reporting limit. QCL - Quality control limit. MCL - Maximum contaminant level. ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-073
Client Sample ID: No. 1 8B-1, (0-12")

Report Date: 12/13/05
Collection Date: 08/02/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	54	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	72	%		1		ASA15-5	12/07/05 17:56 / srm
Silt	17	%		1		ASA15-5	12/07/05 17:56 / srm
Clay	11	%		1		ASA15-5	12/07/05 17:56 / srm
Texture	SL					ASA15-5	12/07/05 17:56 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.80	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.42	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	22.6	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.09	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 14:19 / srm
Nitrate as N, KCL Extract	2	mg/kg		1		ASA33-8.1	12/02/05 18:04 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-074
Client Sample ID: No. 1 8B-2, (25-37")

Report Date: 12/13/05
Collection Date: 08/02/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	58	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	72	%		1		ASA15-5	12/07/05 17:56 / srm
Silt	17	%		1		ASA15-5	12/07/05 17:56 / srm
Clay	11	%		1		ASA15-5	12/07/05 17:56 / srm
Texture	SL					ASA15-5	12/07/05 17:56 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.90	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.20	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	23.0	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.12	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 14:20 / srm
Nitrate as N, KCL Extract	2	mg/kg		1		ASA33-8.1	12/02/05 18:07 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-075
Client Sample ID: No. 1 8C-1, (0-12")

Report Date: 12/13/05
Collection Date: 08/02/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	59	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	70	%		1		ASA15-5	12/07/05 17:56 / srm
Silt	19	%		1		ASA15-5	12/07/05 17:56 / srm
Clay	11	%		1		ASA15-5	12/07/05 17:56 / srm
Texture	SL					ASA15-5	12/07/05 17:56 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.80	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.42	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	26.6	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.16	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 14:22 / srm
Nitrate as N, KCL Extract	3	mg/kg		1		ASA33-8.1	12/02/05 18:07 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-076
Client Sample ID: No. 1 8C-2, (35-47")

Report Date: 12/13/05
Collection Date: 08/02/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	59	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	74	%		1		ASA15-5	12/07/05 17:56 / srm
Silt	14	%		1		ASA15-5	12/07/05 17:56 / srm
Clay	12	%		1		ASA15-5	12/07/05 17:56 / srm
Texture	SL					ASA15-5	12/07/05 17:56 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.90	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.08	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	24.2	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.15	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 14:23 / srm
Nitrate as N, KCL Extract	2	mg/kg		1		ASA33-8.1	12/02/05 18:08 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-077
Client Sample ID: No. 1 9A-2, (26-38")

Report Date: 12/13/05
Collection Date: 08/02/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	60	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	70	%		1		ASA15-5	12/07/05 17:56 / srm
Silt	17	%		1		ASA15-5	12/07/05 17:56 / srm
Clay	13	%		1		ASA15-5	12/07/05 17:56 / srm
Texture	SL					ASA15-5	12/07/05 17:56 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.60	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.35	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	25.7	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.20	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 14:24 / srm
Nitrate as N, KCL Extract	2	mg/kg		1		ASA33-8.1	12/02/05 18:09 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-078
Client Sample ID: No. 1 9B-1, (0-12")

Report Date: 12/13/05
Collection Date: 08/02/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	62	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	72	%		1		ASA15-5	12/07/05 17:56 / srm
Silt	16	%		1		ASA15-5	12/07/05 17:56 / srm
Clay	12	%		1		ASA15-5	12/07/05 17:56 / srm
Texture	SL					ASA15-5	12/07/05 17:56 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.70	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.50	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	26.8	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.16	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 14:26 / srm
Nitrate as N, KCL Extract	2	mg/kg		1		ASA33-8.1	12/02/05 18:09 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-079
Client Sample ID: No. 1 9C-1, (0-12")

Report Date: 12/13/05
Collection Date: 08/02/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	61	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	70	%		1		ASA15-5	12/07/05 17:56 / srm
Silt	18	%		1		ASA15-5	12/07/05 17:56 / srm
Clay	12	%		1		ASA15-5	12/07/05 17:56 / srm
Texture	SL					ASA15-5	12/07/05 17:56 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.70	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.04	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	23.8	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.17	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 14:27 / srm
Nitrate as N, KCL Extract	2	mg/kg		1		ASA33-8.1	12/02/05 18:10 / srm

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-080
Client Sample ID: No. 1 9C-2, (35-47")

Report Date: 12/13/05
Collection Date: 08/02/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	64	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	74	%		1		ASA15-5	12/07/05 17:56 / srm
Silt	14	%		1		ASA15-5	12/07/05 17:56 / srm
Clay	12	%		1		ASA15-5	12/07/05 17:56 / srm
Texture	SL					ASA15-5	12/07/05 17:56 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.80	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.20	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	24.1	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.17	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	3	mg/kg		1		ASA24-5	12/02/05 14:34 / srm
Nitrate as N, KCL Extract	2	mg/kg		1		ASA33-8.1	12/02/05 18:11 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-081
Client Sample ID: No. 1 9D-1, (0-12")

Report Date: 12/13/05
Collection Date: 08/02/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	58	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	73	%		1		ASA15-5	12/07/05 17:56 / srm
Silt	12	%		1		ASA15-5	12/07/05 17:56 / srm
Clay	15	%		1		ASA15-5	12/07/05 17:56 / srm
Texture	SL					ASA15-5	12/07/05 17:56 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.80	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.02	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	25.2	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.14	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 14:36 / srm
Nitrate as N, KCL Extract	2	mg/kg		1		ASA33-8.1	12/02/05 18:12 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-082
Client Sample ID: No. 1 9D-2, (35-47")

Report Date: 12/13/05
Collection Date: 08/02/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	61	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	74	%		1		ASA15-5	12/07/05 17:56 / srm
Silt	13	%		1		ASA15-5	12/07/05 17:56 / srm
Clay	13	%		1		ASA15-5	12/07/05 17:56 / srm
Texture	SL					ASA15-5	12/07/05 17:56 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.80	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.38	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	25.7	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.11	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 14:37 / srm
Nitrate as N, KCL Extract	1	mg/kg		1		ASA33-8.1	12/02/05 18:13 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-083
Client Sample ID: No. 1 9E-1, (0-12")

Report Date: 12/13/05
Collection Date: 08/02/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	65	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	69	%		1		ASA15-5	12/07/05 17:56 / srm
Silt	15	%		1		ASA15-5	12/07/05 17:56 / srm
Clay	16	%		1		ASA15-5	12/07/05 17:56 / srm
Texture	SL					ASA15-5	12/07/05 17:56 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.90	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.07	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	25.2	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.12	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 14:38 / srm
Nitrate as N, KCL Extract	2	mg/kg		1		ASA33-8.1	12/02/05 18:14 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111051-084
Client Sample ID: No. 1 9E-2, (42-54")

Report Date: 12/13/05
Collection Date: 08/02/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	59	wt%		2		ASA15-5	11/30/05 15:29 / srm
Sand	70	%		1		ASA15-5	12/07/05 17:56 / srm
Silt	15	%		1		ASA15-5	12/07/05 17:56 / srm
Clay	15	%		1		ASA15-5	12/07/05 17:56 / srm
Texture	SL					ASA15-5	12/07/05 17:56 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.80	s.u.		0.10		ASAM10-3.2	12/05/05 10:11 / srm
Conductivity, sat. paste	1.08	mmhos/cm		0.01		ASA10-3	12/05/05 10:11 / srm
Saturation	24.5	%		0.1		USDA27a	12/05/05 10:11 / srm
CHEMICAL CHARACTERISTICS							
Organic Carbon	0.21	wt%		0.02		ASA29-3	12/05/05 10:11 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	12/02/05 14:40 / srm
Nitrate as N, KCL Extract	2	mg/kg		1		ASA33-8.1	12/02/05 18:14 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Workorder: B05111051

Report Date: 12/12/05
Date Received: 11/15/05

	Analysis	Coarse Frags	Sand	Silt	Clay	Texture	pH, Sat Paste	Cond_ Paste	Saturation	Organic Carbon	Phos, Olsen	Nitrate as N
	Units	wt%	%	%	%		s_u_	mmhos/cm	%	wt%	mg/kg	mg/kg
Sample ID	Client Sample ID	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results
B05111051-001	No. 1A-1, (0-12")	56	73	16	11	SL	7.10	0.66	19.7	0.07	5	< 1
B05111051-002	No. 1 1A-2, (17-29")	29	69	12	19	SL	7.40	1.76	26.7	0.17	3	3
B05111051-003	No. 1 1B-1, (0-12")	49	79	8	13	SL	6.90	0.58	19.8	0.04	5	< 1
B05111051-004	No. 1 1B-2, (13-25")	59	79	10	11	SL	7.20	0.59	21.5	0.04	4	< 1
B05111051-005	No. 1 1C-1, (0-12")	52	71	14	15	SL	7.20	0.92	22.9	0.17	4	< 1
B05111051-006	No. 1 1C-2, (15-27")	24	65	12	23	SCL	7.30	2.29	27.7	0.20	3	1
B05111051-007	No. 1 1D-1, (0-12")	59	75	13	12	SL	7.20	0.86	21.1	0.06	4	< 1
B05111051-008	No. 1 1D-2, (15-27")	31	67	12	21	SCL	7.40	2.65	27.0	0.14	4	2
B05111051-009	No. 1 1E-1, (0-12")	61	69	16	15	SL	4.80	3.34	26.0	0.17	5	< 1
B05111051-010	No. 1 1E-2, (12-23")	64	75	10	15	SL	7.00	0.68	24.4	0.07	4	< 1
B05111051-011	No. 1 2A-1, (0-12")	58	70	15	15	SL	7.10	0.80	24.1	0.15	5	< 1
B05111051-012	No. 1 2A-2, (30-42")	30	67	13	20	SCL	7.20	1.82	26.9	0.18	3	7
B05111051-013	No. 1 2B-1, (0-12")	60	75	13	12	SL	7.70	0.84	22.9	0.05	4	< 1
B05111051-014	No. 1 2B-2, (25-37")	61	75	12	13	SL	7.30	0.95	21.5	0.08	4	< 1
B05111051-015	No. 1 2C-1, (0-12")	59	71	14	15	SL	7.00	1.50	24.2	0.17	4	< 1
B05111051-016	No. 1 2C-2, (31-43")	22	55	16	29	SCL	7.20	1.60	29.4	0.31	3	2
B05111051-017	No. 1 2D-1, (0-12")	27	67	12	21	SCL	7.00	2.50	23.2	0.17	4	17
B05111051-018	No. 1 2D-2, (26-38")	60	70	15	15	SL	6.20	0.78	22.9	0.15	4	< 1
B05111051-019	No. 1 2E-1, (0-12")	51	73	12	15	SL	7.10	1.41	22.5	0.11	4	< 1
B05111051-020	No. 1 2E-2, (30-42")	56	75	16	9	SL	6.90	0.65	20.0	0.06	4	< 1
B05111051-021	No. 1 3A-1, (0-12")	62	72	17	11	SL	7.20	0.83	20.9	0.10	4	< 1
B05111051-022	No. 1 3A-2, (43-55")	35	73	9	18	SL	7.40	2.58	19.0	0.08	3	1
B05111051-023	No. 1 3B-1, (0-12")	60	71	15	14	SL	7.10	1.34	26.5	0.21	4	< 1
B05111051-024	No. 1 3B-2, (36-48")	51	70	16	14	SL	7.30	1.36	26.4	0.19	4	< 1
B05111051-025	No. 1 3C-1, (0-12")	60	73	13	14	SL	7.40	1.24	22.0	0.09	4	< 1
B05111051-026	No. 1 3C-2, (41-53")	46	68	16	16	SL	7.40	1.83	28.6	0.16	3	< 1
B05111051-027	No. 1 3D-1, (0-12")	60	77	11	12	SL	7.20	1.38	23.2	0.12	4	< 1
B05111051-028	No. 1 3D-2, (39-51")	41	35	23	42	C	6.10	2.16	50.5	0.66	3	100
B05111051-029	No. 1 3E-1, (0-12")	61	72	16	12	SL	7.30	1.29	22.7	0.16	4	1
B05111051-030	No. 1 3E-2, (40-52")	54	78	12	10	SL	7.10	0.42	20.7	0.08	4	< 1
B05111051-031	No. 1 4A-1 (0-12")	47	70	17	13	SL	7.40	1.52	25.5	0.19	4	< 1
B05111051-032	No. 1 4A-2, (21-33")	49	77	11	12	SL	7.60	1.04	21.8	0.10	4	< 1
B05111051-033	No. 1 4B-1, (0-12")	47	74	10	16	SL	7.50	2.31	26.5	0.18	4	1
B05111051-034	No. 1 4B-2, (7-19")	50	72	10	18	SL	7.20	3.11	27.9	0.13	4	< 1
B05111051-035	No. 1 4C-1, (0-12")	60	76	13	11	SL	7.60	0.98	22.2	0.07	4	< 1
B05111051-036	No. 1 4C-2, (15-27")	61	76	13	11	SL	7.50	0.65	20.9	0.05	4	< 1
B05111051-037	No. 1 4D-1, (0-12")	55	76	11	13	SL	7.60	1.04	24.1	0.11	5	1
B05111051-038	No. 1 4D-2, (8-20")	54	76	10	14	SL	7.50	1.68	22.7	0.09	4	1
B05111051-039	No. 1 4E-1, (0-12")	55	70	17	13	SL	7.40	1.26	24.6	0.24	4	1
B05111051-040	No. 1 4E-2, (10-22")	53	68	14	18	SL	7.30	1.96	27.0	0.15	3	1

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800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Workorder: B05111051

Report Date: 12/12/05
Date Received: 11/15/05

	Analysis	Coarse Frags	Sand	Silt	Clay	Texture	pH, Sat Paste	Cond_ Paste	Saturation	Organic Carbon	Phos, Olsen	Nitrate as N
	Units	wt%	%	%	%		s_u_	mmhos/cm	%	wt%	mg/kg	mg/kg
Sample ID	Client Sample ID	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results
B05111051-041	No. 1 5A-1, (0-12")	53	72	12	16	SL	7.50	1.54	24.9	0.12	4	1
B05111051-042	No. 1 5A-2, (34-46")	53	70	14	16	SL	7.50	1.31	23.9	0.16	5	1
B05111051-043	No. 1 5B-1, (0-12")	53	72	14	14	SL	7.50	1.21	23.1	0.12	4	1
B05111051-044	No. 1 5B-2, (29-41")	38	72	11	17	SL	7.30	1.81	26.1	0.16	4	2
B05111051-045	No. 1 5C-1, (0-12")	55	74	12	14	SL	7.40	1.32	25.1	0.14	4	1
B05111051-046	No. 1 5C-2, (22-34")	51	68	18	14	SL	7.40	1.42	25.7	0.15	4	1
B05111051-047	No. 1 5D-1, (0-12")	55	72	15	13	SL	7.40	1.45	23.2	0.16	5	< 1
B05111051-048	No. 1 5D-2, (27-39")	53	72	14	14	SL	7.40	1.18	24.0	0.15	4	1
B05111051-049	No. 1 5E-1, (0-12")	54	74	14	12	SL	7.30	1.34	23.3	0.15	4	< 1
B05111051-050	No. 1 5E-2 (20-32")	56	72	16	12	SL	7.80	1.21	23.3	0.13	4	< 1
B05111051-051	No. 1 6A-1, (0-12")	53	74	15	11	SL	7.50	1.24	23.4	0.15	4	< 1
B05111051-052	No. 1 6A-2, (37-49")	49	75	13	12	SL	7.70	1.54	24.4	0.11	4	< 1
B05111051-053	No. 1 6B-1, (0-12")	54	73	15	12	SL	7.60	1.12	22.2	0.20	4	1
B05111051-054	No. 1 6B-2	62	76	14	10	SL	7.10	0.86	21.4	0.07	4	< 1
B05111051-055	No. 1 6C-1, (0-12")	53	68	16	16	SL	7.40	1.26	27.6	0.31	3	2
B05111051-056	No. 1 6C-2, (44-56")	53	72	15	13	SL	7.60	1.87	25.1	0.13	4	< 1
B05111051-057	No. 1 6D-1, (0-12")	51	70	17	13	SL	7.80	1.58	24.1	0.12	4	< 1
B05111051-058	No. 1 6D-2, (38-50")	50	74	14	12	SL	7.70	1.43	22.8	0.06	4	1
B05111051-059	No. 1 6E-1, (0-12")	49	70	16	14	SL	7.60	1.59	22.6	0.20	4	< 1
B05111051-060	No. 1 6E-2, (46-58")	33	74	9	17	SL	7.50	2.34	25.5	0.15	4	3
B05111051-061	No. 1 7A-1, (0-12")	50	68	18	14	SL	7.50	1.36	25.2	0.32	4	2
B05111051-062	No. 1 7A-2, (17-29")	49	72	14	14	SL	6.70	1.18	26.0	0.24	3	1
B05111051-063	No. 1 7B-1, (0-12")	55	69	17	14	SL	7.40	2.19	24.3	0.22	4	< 1
B05111051-064	No. 1 7B-2, (13-25")	49	70	15	15	SL	7.50	1.02	27.0	0.19	3	2
B05111051-065	No. 1 7C-1, (0-12")	55	70	16	14	SL	7.50	1.48	24.4	0.21	4	1
B05111051-066	No. 1 7C-2, (16-28")	53	70	16	14	SL	7.70	0.90	23.9	0.13	4	1
B05111051-067	No. 1 7D-1, (0-12")	56	72	16	12	SL	7.50	1.25	23.0	0.10	4	1
B05111051-068	No. 1 7D-2, (15-27")	63	76	12	12	SL	7.70	1.07	22.1	0.05	4	< 1
B05111051-069	No. 1 7E-1, (0-12")	51	70	16	14	SL	6.00	0.70	23.0	0.25	4	< 1
B05111051-070	No. 1 7E-2, (12-24")	54	74	14	12	SL	6.70	1.02	23.8	0.15	4	1
B05111051-071	No. 1 8A-1, (0-12")	50	70	18	12	SL	7.70	1.08	25.2	0.15	4	2
B05111051-072	No. 1 8A-2, (26-38")	45	72	15	13	SL	7.60	1.29	22.7	0.14	4	2
B05111051-073	No. 1 8B-1, (0-12")	54	72	17	11	SL	7.80	1.42	22.6	0.09	4	2
B05111051-074	No. 1 8B-2, (25-37")	58	72	17	11	SL	7.90	1.20	23.0	0.12	4	2
B05111051-075	No. 1 8C-1, (0-12")	59	70	19	11	SL	7.80	1.42	26.6	0.16	4	3
B05111051-076	No. 1 8C-2, (35-47")	59	74	14	12	SL	7.90	1.08	24.2	0.15	4	2
B05111051-077	No. 1 9A-2, (26-38")	60	70	17	13	SL	7.60	1.35	25.7	0.20	4	2
B05111051-078	No. 1 9B-1, (0-12")	62	72	16	12	SL	7.70	1.50	26.8	0.16	4	2
B05111051-079	No. 1 9C-1, (0-12")	61	70	18	12	SL	7.70	1.04	23.8	0.17	4	2
B05111051-080	No. 1 9C-2, (35-47")	64	74	14	12	SL	7.80	1.20	24.1	0.17	3	2

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Workorder: B05111051

Report Date: 12/12/05
Date Received: 11/15/05

	Analysis	Coarse Frags	Sand	Silt	Clay	Texture	pH, Sat Paste	Cond_ Paste	Saturation	Organic Carbon	Phos, Olsen	Nitrate as N
	Units	wt%	%	%	%		s_u_	mmhos/cm	%	wt%	mg/kg	mg/kg
Sample ID	Client Sample ID	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results
B05111051-081	No. 1 9D-1, (0-12")	58	73	12	15	SL	7.80	1.02	25.2	0.14	4	2
B05111051-082	No. 1 9D-2, (35-47")	61	74	13	13	SL	7.80	1.38	25.7	0.11	4	1
B05111051-083	No. 1 9E-1, (0-12")	65	69	15	16	SL	7.90	1.07	25.2	0.12	4	2
B05111051-084	No. 1 9E-2, (42-54")	59	70	15	15	SL	7.80	1.08	24.5	0.21	4	2

Energy Laboratories Inc

Sample Receipt Checklist

Client Name Golder Associates Inc

Date and Time Received: 11/15/2005

Work Order Number B05111051

Received by sba

Checklist completed by: Signature 11-15-05 Date

Reviewed by Initials Date

Carrier name UPS ARS Ground

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☐	No ☑	13 °C
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Not Applicable ☑

Adjusted? _____ Checked by _____

Any No and/or NA (not applicable) response must be detailed in the comments section below.

Client contacted _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding: _____

Comments:
COC for samples 077 and 078 originated in lab.

Corrective Action _____

Chain of Custody and Analytical Request Record

Page 1 of 1

PLEASE PRINT, provide as much information as possible. Refer to corresponding notes on reverse side.

Company Name: Golder Associates

Project Name, PWS #, Permit #, Etc.: Tyrone No.1 Test Plots, 053-2377

Report Mail Address: 4910 Alameda Blvd. NE Ste. A Albuquerque, NM 87113

Contact Name, Phone, Fax, E-mail: Lewis Munk 505/821-3043 lmunk@golder.com

Sampler Name if other than Contact:

Invoice Address: Same as above

Invoice Contact & Phone #: same as above

Purchase Order #:

ELI Quote #:

Report Required For: POTW/WWTP ☐ DW ☐ Other _____

Special Report Formats - ELI must be notified prior to sample submittal for the following:

NELAC ☐ A2LA ☐ Level IV ☐

Other _____

EDD/EDT ☐ Format _____

Number of Containers
Sample Type: A Water S Soils/Solids V Vegetation B Bioassay O Other
MATRIX

ANALYSIS REQUESTED

SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	MATRIX	Saturated Paste pH	EC	Saturation %	Sand, Silt, Clay	Rock Fragment	Organic Carbon	Nitrate	Phosphorus	SEE ATTACHED	Normal Turnaround (TAT)	RUSH Turnaround (TAT)
1 No.1 1A-1, (0-12")	6/23/05		soil/solid										X	
2 No.1 1A-2, (17-29")	6/23/05													
3 No.1 1B-1, (0-12")	6/23/05													
4 No.1 1B-2, (13-25")	6/23/05													
5 No.1 1C-1, (0-12")	6/23/05													
6 No.1 1C-2, (15-27")	6/23/05													
7 No.1 1D-1, (0-12")	6/23/05													
8 No.1 1D-2, (15-27")	6/23/05													
9														
10														

Notify ELI prior to RUSH sample submittal for additional charges and scheduling

Comments:

Shipped by: ARSGnd

Cooler ID(s)

Receipt Temp 13 °C

Custody Seal Y N

Intact Y N

Signature Y N

Match

Lab ID

LABORATORY USE ONLY

0511051-001
-002
3
4
5
6
7
8

Custody Record MUST be Signed

Relinquished by (print): Elizabeth Field Date/Time: 10/8/05 Signature: Elizabeth Field

Relinquished by (print): Date/Time: Signature:

Sample Disposal: Return to client: X Lab Disposal

Received by (print): Date/Time: Signature:

Received by (print): Date/Time: 11-15-05/0900 Signature:

LABORATORY USE ONLY

Sample Type: # of fractions

In certain circumstances, samples submitted to Energy Laboratories, Inc may be subcontracted to other certified laboratories in order to complete the analysis requested. This serves as notice of this possibility. All sub-contract data will be clearly notated on your analytical report.

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Chain of Custody and Analytical Request Record

Page 1 of 1

PLEASE PRINT, provide as much information as possible. Refer to corresponding notes on reverse side.

Company Name: Golder Associates

Project Name, PWS #, Permit #, Etc.: Tyrone No.1 Test Plots, 053-2377

Report Mail Address: 4910 Alameda Blvd NE, Ste. A Albuquerque, NM 87113

Contact Name, Phone, Fax, E-mail: Lewis Munk 505/821-3043 lmunk@golder.com

Sampler Name if other than Contact:

Invoice Address: same as above

Invoice Contact & Phone #: same as above

Purchase Order #:

ELI Quote #:

Report Required For: POTW/WWTP ☐ DW ☐ Other _____

Special Report Formats - ELI must be notified prior to sample submittal for the following:

NELAC ☐ A2LA ☐ Level IV ☐

Other _____

EDD/EDT ☐ Format _____

Number of Containers
Sample Type A W S V B O
Air Water Soils/Solids Vegetation Bioassay Other

ANALYSIS REQUESTED

SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	MATRIX	Saturated paste pH	EC	Saturation %	Sand, silt, clay	Rock Fragment	Organic Carbon	Nitrate	Phosphorous	SEE ATTACHED	Normal Turnaround (TAT)	RUSH Turnaround (TAT)	Comments:	LABORATORY USE ONLY Lab ID
1 No.1 1E-1, (0-12")	6/28/05		Soil/solid										X			B051105-009
2 No.1 1E-2, (12-23")	6/28/05												X			10
3 No.1 2A-1, (0-12")	6/28/05												X			11
4 No.1 2A-2, (30-42")	6/28/05												X			12
5 No.1 2B-1, (0-12")	6/28/05												X			13
6 No.1 2B-2, (25-37")	6/28/05												X			14
7 No.1 2C-1, (0-12")	6/28/05												X			15
8 No.1 2C-2, (31-43")	6/28/05												X			16
9																
10																

Notify ELI prior to RUSH sample submittal for additional charges and scheduling

Shipped by: ARS Grd

Cooler ID(s): 1

Receipt Temp: 13 °C

Custody Seal Y N
Intact Y N
Signature Y N
Match

Custody Record MUST be Signed

Relinquished by (print): Elizabeth Field Date/Time: 11/8/05 Signature: Elizabeth Field

Relinquished by (print): Date/Time: Signature:

Received by (print): Date/Time: Signature:

Received by (print): Date/Time: 11-15-05/0900 Signature:

Sample Disposal: Return to client: X Lab Disposal

LABORATORY USE ONLY
Sample Type: # of fractions

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Chain of Custody and Analytical Request Record

Page 1 of 1

PLEASE PRINT, provide as much information as possible. Refer to corresponding notes on reverse side.

Company Name: Golder Associates	Project Name, PWS #, Permit #, Etc.: Tyrone No.1 Test Plots, 053-2377
Report Mail Address: 4910 Alameda Blvd. NE Ste. A Albuquerque, NM 87113	Contact Name, Phone, Fax, E-mail: Lewis Munk 505/821-3043 lmunk@golder.com — Sampler Name if other than Contact:
Invoice Address: same as above	Invoice Contact & Phone #: same as above — Purchase Order #: — ELI Quote #:

Report Required For: POTW/WWTP ☐ DW ☐ Other ____

Special Report Formats - ELI must be notified prior to sample submittal for the following:

NELAC ☐ A2LA ☐ Level IV ☐

Other ____

EDD/EDT ☐ Format ____

Number of Containers; Sample Type: A Air W Water S Soils/Solids V Vegetation B Bioassay O Other

	SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	MATRIX	Saturated Paste pH	EC	Saturation %	Sand, silt, clay	Rock Fragments	Organic Carbon	Nitrate	Phosphorus	SEE ATTACHED	Normal Turnaround (TAT)	RUSH Turnaround (TAT)
1	No.1 2D-1, (0-12")	6/28/05		Soil/Solid	1									X	
2	No.1 2D-2, (26-38")													X	
3	No.1 2E-1, (0-12")													X	
4	No.1 2E-2, (30-42")													X	
5	No.1 3A-1, (0-12")													X	
6	No.1 3A-2, (43-55")													X	
7	No.1 3B-1, (0-12")													X	
8	No.1 3B-2, (36-48")													X	
9															
10															

Notify ELI prior to RUSH sample submittal for additional charges and scheduling

Comments:

Shipped by: ARSGrd

Cooler ID(s) ____

Receipt Temp 13 °C

Custody Seal Y N Intact Y N Signature Y N Match

Lab ID

LABORATORY USE ONLY: 0511105L-017 18 19 20 21 22 23 24

Custody Record MUST be Signed

Relinquished by (print): Elizabeth Field — Date/Time: 11/8/05 — Signature: Elizabeth Field

Relinquished by (print): — Date/Time: — Signature:

Received by (print): — Date/Time: — Signature:

Received by (print): — Date/Time: 11-16-05/0900 — Signature:

Sample Disposal: Return to client: X — Lab Disposal: ____

LABORATORY USE ONLY — Sample Type: ____ # of fractions ____

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Chain of Custody and Analytical Request Record

Page 1 of 1

PLEASE PRINT, provide as much information as possible. Refer to corresponding notes on reverse side.

Company Name: Golder Associates

Project Name, PWS #, Permit #, Etc.: Tyrone No.1 Test Plots, 053-2377

Report Mail Address: 4910 Alameda Blvd. NE Ste.A Albuquerque, NM 87113

Contact Name, Phone, Fax, E-mail: Lewis Munk 505-821-3043 lmunk@golder.com

Sampler Name if other than Contact:

Invoice Address: same as above

Invoice Contact & Phone #: same as above

Purchase Order #:

ELI Quote #:

Report Required For: POTW/WWTP ☐ DW ☐ Other _____

Special Report Formats - ELI must be notified prior to sample submittal for the following:

NELAC ☐ A2LA ☐ Level IV ☐

Other _____

EDD/EDT ☐ Format _____

Notify ELI prior to RUSH sample submittal for additional charges and scheduling

Comments:

Shipped by: ARSlend

Cooler ID(s)

Receipt Temp 13 °C

Custody Seal Y N

Intact Y N

Signature Y N

Match

Lab ID

	SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	MATRIX (Number of Containers; Sample Type A W S V B O; Air Water Soils/Solids Vegetation Bioassay Other)	Saturated Paste pH	EC	Saturation %	Sand, silt, clay	Rock Fragments	Organic Carbon	Nitrate	Phosphorus	SEE ATTACHED	Normal Turnaround (TAT)	RUSH Turnaround (TAT)	Lab ID
1	No.1 3C-1, (0-12")	6/28/05		Soil/solid										X		0511051-025
2	No.1 3C-2, (41-53")													X		26
3	No.1 3D-1, (0-12")													X		27
4	No.1 3D-2, (39-51")													X		28
5	No.1 3E-1, (0-12")													X		29
6	No.1 3E-2, (40-52")													X		30
7	No.1 4A-1, (0-12")	8/2/05												X		31
8	No.1 4A-2, (21-33")	8/2/05												X		32
9																
10																

LABORATORY USE ONLY

Custody Record MUST be Signed

Relinquished by (print): Elizabeth Field Date/Time: 11/8/05 Signature: Elizabeth Field

Relinquished by (print): Date/Time: Signature:

Received by (print): Date/Time: Signature:

Received by (print): Date/Time: 11-16-05/0900 Signature:

Sample Disposal: Return to client: X Lab Disposal: _____

LABORATORY USE ONLY

Sample Type: _____ # of fractions _____

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested. This serves as notice of this possibility. All sub-contract data will be clearly notated on your analytical report.

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ENERGY LABORATORIES

Chain of Custody and Analytical Request Record

Page 1 of 1

PLEASE PRINT, provide as much information as possible. Refer to corresponding notes on reverse side.

Company Name: GOLDER ASSOCIATES	Project Name, PWS #, Permit #, Etc.: Tyrone No.1 Test Plots, 053-2377
Report Mail Address: 4910 Alameda Blvd. NE, Ste. A Albuquerque, NM ~~87110~~ 87113	Contact Name, Phone, Fax, E-mail: Lewis Munk 505-821-3043 lmunk@golder.com Sampler Name if other than Contact:
Invoice Address: same as above	Invoice Contact & Phone #: same as above Purchase Order #: ELI Quote #:

Report Required For: POTW/WWTP ☐ DW ☐ Other _____

Special Report Formats - ELI must be notified prior to sample submittal for the following:

NELAC ☐ A2LA ☐ Level IV ☐

Other _____

EDD/EDT ☐ Format _____

Notify ELI prior to RUSH sample submittal for additional charges and scheduling

Comments:

Shipped by: ABS-Ford

Cooler ID(s) —

Receipt Temp 13 °C

Custody Seal Y N

Intact Y N

Signature Y N

Match

Lab ID

	SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	Number of Containers / Sample Type: A W S V B O / Air Water Soils/Solids Vegetation Bioassay Other / MATRIX	Saturated Paste pH	EC	Saturation %	Sand, Silt, clay	Rock fragments	organic carbon	nitrate	phosphorus	SEE ATTACHED	Normal Turnaround (TAT)	RUSH Turnaround (TAT)	Lab ID
1	No.1 4B-1, (0-12")	8/2/05		Soil/Solid										X		0511051-033
2	No.1 4B-2, (7-19")	↓		↓										X		34
3	No.1 4C-1, (0-12")													X		35
4	No.1 4C-2, (15-27")													X		36
5	No.1 4D-1, (0-12")													X		37
6	No.1 4D-2, (8-20")													X		38
7	No.1 4E-1, (0-12")													X		39
8	No.1 4E-2, (10-22")	↓		↓	↓	↓	↓	↓	↓	↓	↓	↓		X		40
9																
10																

LABORATORY USE ONLY

Custody Record MUST be Signed

Relinquished by (print): Elizabeth Field	Date/Time: 11/8/05	Signature: Elizabeth Field	Received by (print):
Relinquished by (print):	Date/Time:	Signature:	Received by (print): Date/Time: 11-16-05 0900 Signature:

Sample Disposal: Return to client: X Lab Disposal: _____

LABORATORY USE ONLY

Sample Type: _____ # of fractions _____

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested. This serves as notice of this possibility. All sub-contract data will be clearly notated on your analytical report.

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Chain of Custody and Analytical Request Record

Page 1 of 1

PLEASE PRINT, provide as much information as possible. Refer to corresponding notes on reverse side.

Company Name: Golder Associates

Report Mail Address: 4910 Alameda Blvd. NE Ste. A Albuquerque, NM 87113

Invoice Address: 4910 Alameda Blvd. NE Ste. A Albuquerque, NM 87113

Project Name, PWS #, Permit #, Etc.: Tyrone No.1 Test Plots, 053-2377

Contact Name, Phone, Fax, E-mail: Lewis Munk (505)821-3043 lmunk@golder.com

Sampler Name if other than Contact:

Invoice Contact & Phone #: Lewis Munk 505-821-3043 lmunk@golder.com

Purchase Order #:

ELI Quote #:

Report Required For: POTW/WWTP ☐ DW ☐ Other ____

Special Report Formats - ELI must be notified prior to sample submittal for the following:

NELAC ☐ A2LA ☐ Level IV ☐

Other ____

EDD/EDT ☐ Format ____

Number of Containers
Sample Type: A Air W Water S Soils/Solids V Vegetation B Bioassay O Other

ANALYSIS REQUESTED

SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	MATRIX	Saturated Paste pH	EC	Saturation %	Sand, silt, clay	rock fragments	organic carbon	nitrate	phosphorus	SEE ATTACHED	Normal Turnaround (TAT)	RUSH Turnaround (TAT)	LABORATORY USE ONLY
1 No.1 5A-1, (0-12")	8/3/05		Soil/Solid										X		L05111051-042
2 No.1 5A-2, (34-46")													X		43
3 No.1 5B-1, (0-12")													X		44
4 No.1 5B-2, (29-41")													X		45
5 No.1 5C-1, (0-12")													X		46
6 No.1 5C-2, (22-34")													X		47
7 No.1 5D-1, (0-12")													X		48
8 No.1 5D-2, (27-39")													X		
9															
10															

Notify ELI prior to RUSH sample submittal for additional charges and scheduling

Comments:

Shipped by: ARS-Grd

Cooler ID(s)

Receipt Temp 13 °C

Custody Seal Y N
Intact Y N
Signature Y N
Match
Lab ID

Custody Record MUST be Signed

Relinquished by (print): Elizabeth Field Date/Time: 11/8/05 Signature: Elizabeth Field

Relinquished by (print): Date/Time: Signature:

Received by (print): Date/Time: Signature:

Received by (print): Date/Time: 11-15-05/0900 Signature:

Sample Disposal Return to client: X Lab Disposal: ____

LABORATORY USE ONLY
Sample Type: ____ # of fractions ____

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Chain of Custody and Analytical Request Record

Page 1 of 1

PLEASE PRINT, provide as much information as possible. Refer to corresponding notes on reverse side.

Company Name: Golder Associates

Project Name, PWS #, Permit #, Etc.: Tyrone No.1 Test Plots, 053-2377

Report Mail Address: 4910 Alameda Blvd. NE Ste. A Albuquerque, NM 87113

Contact Name, Phone, Fax, E-mail: Lewis Munk (505)821-3043 lmunk@golder.com

Sampler Name if other than Contact:

Invoice Address: 4910 Alameda Blvd. NE Ste. A Albuquerque, NM 87113

Invoice Contact & Phone #: Lewis Munk 505-821-3043 lmunk@golder.com

Purchase Order #:

ELI Quote #:

Report Required For: POTW/WWTP ☐ DW ☐ Other ____

Special Report Formats - ELI must be notified prior to sample submittal for the following:
NELAC ☐ A2LA ☐ Level IV ☐
Other ____
EDD/EDT ☐ Format ____

Number of Containers
Sample Type: A Air W Water S Soils/Solids V Vegetation B Bioassay O Other
MATRIX

ANALYSIS REQUESTED

SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	MATRIX	Saturated Paste pH	EC	Saturation %	Sand, silt, clay	rock fragments	Organic Carbon	nitrate	phosphorus	SEE ATTACHED	Normal Turnaround (TAT)	RUSH Turnaround (TAT)
1 No.1 5E-1, (0-12")	8/3/05		Soil/Solid										X	
2 No.1 5E-2, (20-32")													X	
3 No.1 6A-1, (0-12")													X	
4 No.1 6A-2, (37-49")													X	
5 No.1 6B-1, (0-12")													X	
6 No.1 6B-2,													X	
7 No.1 6C-1, (0-12")													X	
8 No.1 6C-2, (44-56")													X	
9														
10														

Notify ELI prior to RUSH sample submittal for additional charges and scheduling

Comments:

Shipped by: ARS-Grd

Cooler ID(s)

Receipt Temp 13 °C

Custody Seal Y N
Intact Y N
Signature Y N
Match
Lab ID

LABORATORY USE ONLY
0511051-049
50
51
52
53
54
55
56

Custody Record MUST be Signed

Relinquished by (print): Elizabeth Field Date/Time: 11/8/05 Signature: Elizabeth Field

Relinquished by (print): Date/Time: Signature:

Received by (print): Date/Time: Signature:

Received by (print): Date/Time: 11-15-05/0900 Signature:

Sample Disposal: Return to client: X Lab Disposal:

LABORATORY USE ONLY
Sample Type: # of fractions

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Chain of Custody and Analytical Request Record

Page 1 of 1

PLEASE PRINT, provide as much information as possible. Refer to corresponding notes on reverse side.

Company Name: Golder Associates	Project Name, PWS #, Permit #, Etc.: Tyrone No.1 Test Plots, 053-2377
Report Mail Address: 4910 Alameda Blvd. NE Ste. A Albuquerque, NM 87113	Contact Name, Phone, Fax, E-mail: Lewis Munk (505)821-3043 lmunk@golder.com — Sampler Name if other than Contact:
Invoice Address: 4910 Alameda Blvd. NE Ste. A Albuquerque, NM 87113	Invoice Contact & Phone #: Lewis Munk 505-821-3043 lmunk@golder.com — Purchase Order #: — ELI Quote #:

Report Required For: POTW/WWTP ☐ DW ☐ Other _____

Special Report Formats - ELI must be notified prior to sample submittal for the following:

NELAC ☐ A2LA ☐ Level IV ☐

Other _____

EDD/EDT ☐ Format _____

Notify ELI prior to RUSH sample submittal for additional charges and scheduling

Comments:

Shipped by: ARS-6nd

Cooler ID(s) _____

Receipt Temp 13 °C

Custody Seal Y N

Intact Y N

Signature Y N

Match

Lab ID

	SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	Number of Containers / Sample Type A W S V B O / Air Water Soils/Solids Vegetation Bioassay Other / MATRIX	Saturated paste pH	EC	Saturation %	Sand silt, clay	rock fragments	organic carbon	nitrate	phosphorus	SEE ATTACHED	Normal Turnaround (TAT)	RUSH Turnaround (TAT)	LABORATORY USE ONLY
1	No.1 6D-1, (0-12")	8/3/05		Soil/Solid										X		B051111251-057
2	No.1 6D-2, (38-50")	8/3/05												X		58
3	No.1 6E-1, (0-12")	8/3/05												X		59
4	No.1 6E-2, (46-58")	8/3/05												X		60
5	No.1 7A-1, (0-12")	7/21/05												X		61
6	No.1 7A-2, (17-29")	7/21/05		↓	↓	↓	↓	↓	↓	↓	↓	↓		X		62
7																
8																
9																
10																

Custody Record MUST be Signed

Relinquished by (print): Elizabeth Field	Date/Time: 11/8/05	Signature: Elizabeth Field	Received by (print):	Date/Time:	Signature:
Relinquished by (print):	Date/Time:	Signature:	Received by (print):	Date/Time: 11-15-05/0900	Signature:

Sample Disposal: Return to client: X Lab Disposal: _____

Sample Type: _____ # of fractions _____

LABORATORY USE ONLY

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Chain of Custody and Analytical Request Record

Page 1 of 1

PLEASE PRINT, provide as much information as possible. Refer to corresponding notes on reverse side.

Company Name: Golder Associates

Project Name, PWS #, Permit #, Etc.: Tyrone No.1 Test Plots, 053-2377

Report Mail Address: 4910 Alameda Blvd. NE Ste. A Albuquerque, NM 87113

Contact Name, Phone, Fax, E-mail: Lewis Munk (505)821-3043 lmunk@golder.com

Sampler Name if other than Contact:

Invoice Address: 4910 Alameda Blvd. NE Ste. A Albuquerque, NM 87113

Invoice Contact & Phone #: Lewis Munk 505-821-3043 lmunk@golder.com

Purchase Order #:

ELI Quote #:

Report Required For: POTW/WWTP ☐ DW ☐ Other _____

Special Report Formats - ELI must be notified prior to sample submittal for the following:

NELAC ☐ A2LA ☐ Level IV ☐

Other _____

EDD/EDT ☐ Format _____

Number of Containers; Sample Type: A Air W Water S Soils/Solids V Vegetation B Bioassay O Other

ANALYSIS REQUESTED

SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	MATRIX	Saturated Paste pH	EC	Saturation %	Sand, silt, clay	Rock fragments	organic carbon	% nitrate	phosphorus	SEE ATTACHED	Normal Turnaround (TAT)	RUSH Turnaround (TAT)	LABORATORY USE ONLY
1 No.1 7B-1, (0-12")	7/21/05		soil/solid										X		0511065
2 No.1 7B-2, (13-25")													X		67
3 No.1 7C-1, (0-12")													X		69
4 No.1 7C-2, (16-28")													X		66
5 No.1 7D-1, (0-12")													X		68
6 No.1 7D-2, (15-27")													X		68
7															
8															
9															
10															

Notify ELI prior to RUSH sample submittal for additional charges and scheduling

Comments:

Shipped by: ARS-6.1

Cooler ID(s)

Receipt Temp 13 °C

Custody Seal Y N

Intact Y N

Signature Y N

Match

Lab ID

Custody Record MUST be Signed

Relinquished by (print): Elizabeth Field Date/Time: 11/8/05 Signature: Elizabeth Field

Relinquished by (print): Date/Time: Signature:

Received by (print): Date/Time: Signature:

Received by (print): Date/Time: 11-15-05 0900 Signature:

Sample Disposal: Return to client: X Lab Disposal:

LABORATORY USE ONLY

Sample Type: # of fractions

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Chain of Custody and Analytical Request Record

Page 1 of 1

PLEASE PRINT, provide as much information as possible. Refer to corresponding notes on reverse side.

Company Name: Golder Associates	Project Name, PWS #, Permit #, Etc.: Tyrone No.1 Test Plots, 053-2377
Report Mail Address: 4910 Alameda Blvd. NE Ste. A Albuquerque, NM 87113	Contact Name, Phone, Fax, E-mail: Lewis Munk (505)821-3043 lmunk@golder.com — Sampler Name if other than Contact:
Invoice Address: 4910 Alameda Blvd. NE Ste. A Albuquerque, NM 87113	Invoice Contact & Phone #: Lewis Munk 505-821-3043 lmunk@golder.com — Purchase Order #: — ELI Quote #:

Report Required For: POTW/WWTP ☐ DW ☐ Other _____

Special Report Formats - ELI must be notified prior to sample submittal for the following:

NELAC ☐ A2LA ☐ Level IV ☐

Other _____

EDD/EDT ☐ Format _____

Notify ELI prior to RUSH sample submittal for additional charges and scheduling

Shipped by: AKS-hand

Cooler ID(s) _____

Receipt Temp 13 °C

Custody Seal Y N

Intact Y N

Signature Y N

Match

Lab ID

Comments:

	SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	Number of Containers / Sample Type: A W S V B O / Air Water Soils/Solids Vegetation Bioassay Other — MATRIX	Saturated Paste pH	EC	Saturation %	Sand, silt, clay	rock fragments	organic carbon	nitrate	phosphorus	SEE ATTACHED	Normal Turnaround (TAT)	RUSH Turnaround (TAT)	LABORATORY USE ONLY
1	No.1 7E-1, (0-12")	7/21/05		Soil/Solid										X		0511051-068
2	No.1 7E-2, (12-24")	7/21/05												X		69
3	No.1 8A-1, (0-12")	8/2/05												X		74
4	No.1 8A-2, (26-38")	8/2/05												X		72
5	No.1 8B-1, (0-12")	8/2/05												X		73
6	No.1 8B-2, (25-37")	8/2/05												X		74
7	No.1 8C-1, (0-12")	8/2/05												X		75
8	No.1 8C-2, (35-47")	8/2/05												X		76
9																
10																

Custody Record MUST be Signed

	Relinquished by (print):	Date/Time:	Signature:	Received by (print):	Date/Time:	Signature:
	Elizabeth Field	11/8/05	Elizabeth Field			
	Relinquished by (print):	Date/Time:	Signature:	Received by (print)	Date/Time:	Signature
					11-15-05/0900	

Sample Disposal: Return to client: X Lab Disposal: _____

LABORATORY USE ONLY

Sample Type: _____ # of fractions _____

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ENERGY LABORATORIES

Temp Chain of Custody and Analytical Request Record

Page ____ of ____

PLEASE PRINT, provide as much information as possible. Refer to corresponding notes on reverse side.

Company Name:	Project Name, PWS #, Permit #, Etc.:
Report Mail Address:	Contact Name, Phone, Fax, E-mail: / Sampler Name if other than Contact:
Invoice Address:	Invoice Contact & Phone #: / Purchase Order #: / ELI Quote #:

Report Required For: POTW/WWTP ☐ DW ☐ Other ____

Special Report Formats - ELI must be notified prior to sample submittal for the following:
NELAC ☐ A2LA ☐ Level IV ☐
Other ____
EDD/EDT ☐ Format ____

ANALYSIS REQUESTED

Notify ELI prior to RUSH sample submittal for additional charges and scheduling

Comments:

Shipped by: ARB Grd
Cooler ID(s)
Receipt Temp 13 °C
Custody Seal Y N
Intact Y N
Signature Match Y N

#	SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	Number of Containers / Sample Type: A W S V B O (Air Water Soils/Solids Vegetation Bioassay Other) MATRIX	Sat paste pH	EC	Sat %	Sand, Silt, Clay	Rock Fragment	Org Carbon	Nitrate	Phos		SEE ATTACHED	Normal Turnaround (TAT)	RUSH Turnaround (TAT)	Comments	LABORATORY USE ONLY Lab ID
1	No1-9A-2 (26-38")	8-2-05																B05111051-077
2	No1 9B-1 (0-12")	〃																78
3																		
4																		
5																	COC ORIGINATED IN LABORATORY	
6																		
7																		
8																		
9																		
10																		

Custody Record MUST be Signed

Relinquished by (print):	Date/Time:	Signature:	Received by (print):	Date/Time:	Signature:
Relinquished by (print):	Date/Time:	Signature:	Received by (print): [signature]	Date/Time: 11-15-05 0900	Signature:

Sample Disposal: Return to client: ____ Lab Disposal: ____

LABORATORY USE ONLY
Sample Type: ____ # of fractions ____

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Company Name: Golder Associates

Project Name, PWS #, Permit #, Etc.: Tyrone No.1 Test Plots, 053-2377

Report Mail Address: 4910 Alameda Blvd. NE Ste. A Albuquerque, NM 87113

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Sampler Name if other than Contact:

Invoice Address: 4910 Alameda Blvd. NE Ste. A Albuquerque, NM 87113

Invoice Contact & Phone #: Lewis Munk 505-821-3043 lmunk@golder.com

Purchase Order #:

ELI Quote #:

Report Required For: POTW/WWTP ☐ DW ☐ Other _____

Special Report Formats - ELI must be notified prior to sample submittal for the following:

NELAC ☐ A2LA ☐ Level IV ☐

Other _____

EDD/EDT ☐ Format _____

Shipped by: ADS-6rd

Cooler ID(s)

Receipt Temp 13 °C

Custody Seal Y N

Intact Y N

Signature Y N

Match

Lab ID

Notify ELI prior to RUSH sample submittal for additional charges and scheduling

Comments:

	SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	Number of Containers / Sample Type: A W S V B O / Air Water Soils/Solids Vegetation Bioassay Other / MATRIX	Saturated Paste pH	EC	Saturation %	Sand, silt, clay	rock fragments	organic carbon	nitrate	phosphorus	SEE ATTACHED	Normal Turnaround (TAT)	RUSH Turnaround (TAT)	LABORATORY USE ONLY
1	No.1 9C-1, (0-12")	8/2/05		soil/solid										X		B505111051-079
2	No.1 9C-2, (35-47")													X		80
3	No.1 9D-1, (0-12")													X		81
4	No.1 9D-2, (35-47")													X		82
5	No.1 9E-1, (0-12")													X		83
6	No.1 9E-2, (42-54")	↓		↓	↓	↓	↓	↓	↓	↓	↓	↓		X		84
7																
8																
9																
10																

Custody Record MUST be Signed

Relinquished by (print): Elizabeth Field Date/Time: 11/8/05 Signature: Elizabeth Field

Relinquished by (print): Date/Time: Signature:

Received by (print): Date/Time: Signature:

Received by (print): Date/Time: 11-15-05/0900 Signature:

Sample Disposal: Return to client: X Lab Disposal: _____

LABORATORY USE ONLY

Sample Type: _____ # of fractions _____

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APPENDIX B

CHEMICAL AND PHYSICAL LABORATORY DATA
STOCKPILE MATERIALS

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

ANALYTICAL SUMMARY REPORT

December 02, 2005

Lewis Munk
Golder Associates Inc
4910 Alameda Blvd NE, Ste A
Albuquerque, NM 87113

Workorder No.: B05111047

Project Name: Tyrone No. 1 Test Plots, 053-2377

Energy Laboratories Inc received the following 40 samples from Golder Associates Inc on 11/15/2005 for analysis.

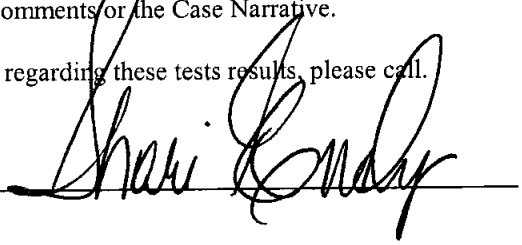
Sample ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
B05111047-001	No.1 Lys 3-A, 0-2'	05/11/05 0:00	11/15/05	Soil	Coarse Fragments Conductivity pH, Saturated Paste Particle Size Analysis Saturation Percentage Texture
B05111047-002	No. 1 Lys-3A, 2-3'	05/11/05 0:00	11/15/05	Soil	Same As Above
B05111047-003	No. 1 8-A Lys Top, 6' bgs	05/04/05 0:00	11/15/05	Soil	Same As Above
B05111047-004	No. 1 8-A Lys Mid 8' bgs	05/04/05 0:00	11/15/05	Soil	Same As Above
B05111047-005	No. 1 TP-8, 4' bgs	05/04/05 0:00	11/15/05	Soil	Same As Above
B05111047-006	No. 1 TP-8, 6' bgs	05/04/05 0:00	11/15/05	Soil	Same As Above
B05111047-007	No. 1 TP-8, 8' bgs	05/04/05 0:00	11/15/05	Soil	Same As Above
B05111047-008	No. 1 1-B, 0-2'	05/11/05 0:00	11/15/05	Soil	Same As Above
B05111047-009	No. 1 1-B, 2-3'	05/11/05 0:00	11/15/05	Soil	Same As Above
B05111047-010	No. 1 1-B, 4-5'	05/11/05 0:00	11/15/05	Soil	Same As Above
B05111047-011	No. 1 1-C, 0-2'	05/11/05 0:00	11/15/05	Soil	Same As Above
B05111047-012	No. 1 1-C, 2-3'	05/11/05 0:00	11/15/05	Soil	Same As Above
B05111047-013	No. 1 1-C, 4-5'	05/11/05 0:00	11/15/05	Soil	Same As Above
B05111047-014	No. 1 2-A, (0-2')	05/12/05 0:00	11/15/05	Soil	Same As Above
B05111047-015	No. 1 2-A, (3-4')	05/12/05 0:00	11/15/05	Soil	Same As Above
B05111047-016	No. 1 3-B, (0-2')	05/12/05 0:00	11/15/05	Soil	Same As Above
B05111047-017	No. 1 3-B, (2-3')	05/12/05 0:00	11/15/05	Soil	Same As Above
B05111047-018	No. 1 3-C, (0-2')	05/12/05 0:00	11/15/05	Soil	Same As Above
B05111047-019	No. 1 3-C, (2-3')	05/12/05 0:00	11/15/05	Soil	Same As Above
B05111047-020	No. 1 4-A, 0-2'	05/12/05 0:00	11/15/05	Soil	Same As Above
B05111047-021	No. 1 4-A, 2-3'	05/12/05 0:00	11/15/05	Soil	Same As Above

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

B05111047-022	No. 1 4-A, 4-5'	05/12/05 0:00	11/15/05	Soil	Same As Above
B05111047-023	No. 1 5-A, 0-2'	05/12/05 0:00	11/15/05	Soil	Same As Above
B05111047-024	No. 1 5-A, 3-4'	05/12/05 0:00	11/15/05	Soil	Same As Above
B05111047-025	No. 1 6-A, 0-2'	05/12/05 0:00	11/15/05	Soil	Same As Above
B05111047-026	No. 1 6-A, 2-3'	05/12/05 0:00	11/15/05	Soil	Same As Above
B05111047-027	No. 1 7-A, 0-2'	05/12/05 0:00	11/15/05	Soil	Same As Above
B05111047-028	No. 1 7-A, 2-3'	05/12/05 0:00	11/15/05	Soil	Same As Above
B05111047-029	No. 1 7-A, 4-5'	05/12/05 0:00	11/15/05	Soil	Same As Above
B05111047-030	No. 1 8-A, 0-2'	05/05/05 0:00	11/15/05	Soil	Same As Above
B05111047-031	No. 1 8-A, 3-4'	05/05/05 0:00	11/15/05	Soil	Same As Above
B05111047-032	No. 1 9-A, 0-2'	05/12/05 0:00	11/15/05	Soil	Same As Above
B05111047-033	No. 1 9-A, 2-3'	05/12/05 0:00	11/15/05	Soil	Same As Above
B05111047-034	No. 1 10-A, 0-2'		11/15/05	Soil	Same As Above
B05111047-035	No. 1 10-A, 3-4'		11/15/05	Soil	Same As Above
B05111047-036	No. 1 10-A, 4-5'		11/15/05	Soil	Same As Above
B05111047-037	No. 1 10-A, 6-7'		11/15/05	Soil	Same As Above
B05111047-038	No. 1 Lys 1-A, 0-2'	05/10/05 0:00	11/15/05	Soil	Same As Above
B05111047-039	No. 1 Lys 1-A, 2-3'	05/10/05 0:00	11/15/05	Soil	Same As Above
B05111047-040	No. 1 Lys 1-A, 4-5'	05/10/05 0:00	11/15/05	Soil	Same As Above

There were no problems with the analyses and all data for associated QC met EPA or laboratory specifications except if noted in report comments or the Case Narrative.

If you have any questions regarding these tests results, please call.

Report Approved By: 

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111047-001
Client Sample ID: No.1 Lys 3-A, 0-2'

Report Date: 12/02/05
Collection Date: 05/11/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	34	wt%		2		ASA15-5	11/30/05 15:18 / srm
Sand	50	%		1		ASA15-5	12/01/05 10:45 / srm
Silt	27	%		1		ASA15-5	12/01/05 10:45 / srm
Clay	23	%		1		ASA15-5	12/01/05 10:45 / srm
Texture	SCL					ASA15-5	12/01/05 10:45 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	2.90	s.u.		0.10		ASAM10-3.2	11/30/05 15:18 / srm
Conductivity, sat. paste	6.50	mmhos/cm		0.01		ASA10-3	11/30/05 15:18 / srm
Saturation	40.1	%		0.1		USDA27a	11/30/05 15:18 / srm

Report Definitions:
RL - Analyte reporting limit.
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MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111047-002
Client Sample ID: No. 1 Lys-3A, 2-3'

Report Date: 12/02/05
Collection Date: 05/11/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	45	wt%		2		ASA15-5	11/30/05 15:18 / srm
Sand	50	%		1		ASA15-5	12/01/05 10:45 / srm
Silt	27	%		1		ASA15-5	12/01/05 10:45 / srm
Clay	23	%		1		ASA15-5	12/01/05 10:45 / srm
Texture	SCL					ASA15-5	12/01/05 10:45 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	2.90	s.u.		0.10		ASAM10-3.2	11/30/05 15:18 / srm
Conductivity, sat. paste	6.43	mmhos/cm		0.01		ASA10-3	11/30/05 15:18 / srm
Saturation	38.6	%		0.1		USDA27a	11/30/05 15:18 / srm

Report Definitions:
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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111047-003
Client Sample ID: No. 1 8-A Lys Top, 6' bgs

Report Date: 12/02/05
Collection Date: 05/04/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	51	wt%		2		ASA15-5	11/30/05 15:18 / srm
Sand	52	%		1		ASA15-5	12/01/05 10:45 / srm
Silt	25	%		1		ASA15-5	12/01/05 10:45 / srm
Clay	23	%		1		ASA15-5	12/01/05 10:45 / srm
Texture	SCL					ASA15-5	12/01/05 10:45 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	2.50	s.u.		0.10		ASAM10-3.2	11/30/05 15:18 / srm
Conductivity, sat. paste	6.32	mmhos/cm		0.01		ASA10-3	11/30/05 15:18 / srm
Saturation	36.7	%		0.1		USDA27a	11/30/05 15:18 / srm

Report Definitions:
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MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111047-004
Client Sample ID: No. 1 8-A Lys Mid 8' bgs

Report Date: 12/02/05
Collection Date: 05/04/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	58	wt%		2		ASA15-5	11/30/05 15:18 / srm
Sand	50	%		1		ASA15-5	12/01/05 10:45 / srm
Silt	27	%		1		ASA15-5	12/01/05 10:45 / srm
Clay	23	%		1		ASA15-5	12/01/05 10:45 / srm
Texture	SCL					ASA15-5	12/01/05 10:45 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	2.70	s.u.		0.10		ASAM10-3.2	11/30/05 15:18 / srm
Conductivity, sat. paste	5.55	mmhos/cm		0.01		ASA10-3	11/30/05 15:18 / srm
Saturation	36.0	%		0.1		USDA27a	11/30/05 15:18 / srm

Report Definitions:
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MCL - Maximum contaminant level.
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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111047-005
Client Sample ID: No. 1 TP-8, 4' bgs

Report Date: 12/02/05
Collection Date: 05/04/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	46	wt%		2		ASA15-5	11/30/05 15:18 / srm
Sand	52	%		1		ASA15-5	12/01/05 10:45 / srm
Silt	25	%		1		ASA15-5	12/01/05 10:45 / srm
Clay	23	%		1		ASA15-5	12/01/05 10:45 / srm
Texture	SCL					ASA15-5	12/01/05 10:45 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	2.70	s.u.		0.10		ASAM10-3.2	11/30/05 15:18 / srm
Conductivity, sat. paste	5.75	mmhos/cm		0.01		ASA10-3	11/30/05 15:18 / srm
Saturation	35.9	%		0.1		USDA27a	11/30/05 15:18 / srm

Report Definitions:
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QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111047-006
Client Sample ID: No. 1 TP-8, 6' bgs

Report Date: 12/02/05
Collection Date: 05/04/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	44	wt%		2		ASA15-5	11/30/05 15:18 / srm
Sand	51	%		1		ASA15-5	12/01/05 10:45 / srm
Silt	26	%		1		ASA15-5	12/01/05 10:45 / srm
Clay	23	%		1		ASA15-5	12/01/05 10:45 / srm
Texture	SCL					ASA15-5	12/01/05 10:45 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	2.80	s.u.		0.10		ASAM10-3.2	11/30/05 15:18 / srm
Conductivity, sat. paste	5.45	mmhos/cm		0.01		ASA10-3	11/30/05 15:18 / srm
Saturation	36.3	%		0.1		USDA27a	11/30/05 15:18 / srm

Report Definitions:
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MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111047-007
Client Sample ID: No. 1 TP-8, 8' bgs

Report Date: 12/02/05
Collection Date: 05/04/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	52	wt%		2		ASA15-5	11/30/05 15:18 / srm
Sand	51	%		1		ASA15-5	12/01/05 10:45 / srm
Silt	26	%		1		ASA15-5	12/01/05 10:45 / srm
Clay	23	%		1		ASA15-5	12/01/05 10:45 / srm
Texture	SCL					ASA15-5	12/01/05 10:45 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	2.80	s.u.		0.10		ASAM10-3.2	11/30/05 15:18 / srm
Conductivity, sat. paste	5.27	mmhos/cm		0.01		ASA10-3	11/30/05 15:18 / srm
Saturation	35.2	%		0.1		USDA27a	11/30/05 15:18 / srm

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111047-008
Client Sample ID: No. 1 1-B, 0-2'

Report Date: 12/02/05
Collection Date: 05/11/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	41	wt%		2		ASA15-5	11/30/05 15:18 / srm
Sand	48	%		1		ASA15-5	12/01/05 10:45 / srm
Silt	29	%		1		ASA15-5	12/01/05 10:45 / srm
Clay	23	%		1		ASA15-5	12/01/05 10:45 / srm
Texture	L					ASA15-5	12/01/05 10:45 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	3.40	s.u.		0.10		ASAM10-3.2	11/30/05 15:18 / srm
Conductivity, sat. paste	7.06	mmhos/cm		0.01		ASA10-3	11/30/05 15:18 / srm
Saturation	39.3	%		0.1		USDA27a	11/30/05 15:18 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111047-009
Client Sample ID: No. 1 1-B, 2-3'

Report Date: 12/02/05
Collection Date: 05/11/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	51	wt%		2		ASA15-5	11/30/05 15:18 / srm
Sand	50	%		1		ASA15-5	12/01/05 10:45 / srm
Silt	27	%		1		ASA15-5	12/01/05 10:45 / srm
Clay	23	%		1		ASA15-5	12/01/05 10:45 / srm
Texture	SCL					ASA15-5	12/01/05 10:45 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	3.40	s.u.		0.10		ASAM10-3.2	11/30/05 15:18 / srm
Conductivity, sat. paste	7.35	mmhos/cm		0.01		ASA10-3	11/30/05 15:18 / srm
Saturation	39.5	%		0.1		USDA27a	11/30/05 15:18 / srm

Report Definitions:
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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111047-010
Client Sample ID: No. 1 1-B, 4-5'

Report Date: 12/02/05
Collection Date: 05/11/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	42	wt%		2		ASA15-5	11/30/05 15:18 / srm
Sand	48	%		1		ASA15-5	12/01/05 10:45 / srm
Silt	30	%		1		ASA15-5	12/01/05 10:45 / srm
Clay	22	%		1		ASA15-5	12/01/05 10:45 / srm
Texture	L					ASA15-5	12/01/05 10:45 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	3.60	s.u.		0.10		ASAM10-3.2	11/30/05 15:18 / srm
Conductivity, sat. paste	7.28	mmhos/cm		0.01		ASA10-3	11/30/05 15:18 / srm
Saturation	39.0	%		0.1		USDA27a	11/30/05 15:18 / srm

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MCL - Maximum contaminant level.
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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111047-011
Client Sample ID: No. 1 1-C, 0-2'

Report Date: 12/02/05
Collection Date: 05/11/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	42	wt%		2		ASA15-5	11/30/05 15:18 / srm
Sand	48	%		1		ASA15-5	12/01/05 10:45 / srm
Silt	30	%		1		ASA15-5	12/01/05 10:45 / srm
Clay	22	%		1		ASA15-5	12/01/05 10:45 / srm
Texture	L					ASA15-5	12/01/05 10:45 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	2.90	s.u.		0.10		ASAM10-3.2	11/30/05 15:18 / srm
Conductivity, sat. paste	6.02	mmhos/cm		0.01		ASA10-3	11/30/05 15:18 / srm
Saturation	40.8	%		0.1		USDA27a	11/30/05 15:18 / srm

Report Definitions:
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ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111047-012
Client Sample ID: No. 1 1-C, 2-3'

Report Date: 12/02/05
Collection Date: 05/11/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	35	wt%		2		ASA15-5	11/30/05 15:18 / srm
Sand	50	%		1		ASA15-5	12/01/05 10:45 / srm
Silt	28	%		1		ASA15-5	12/01/05 10:45 / srm
Clay	22	%		1		ASA15-5	12/01/05 10:45 / srm
Texture	L					ASA15-5	12/01/05 10:45 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	2.80	s.u.		0.10		ASAM10-3.2	11/30/05 15:18 / srm
Conductivity, sat. paste	5.74	mmhos/cm		0.01		ASA10-3	11/30/05 15:18 / srm
Saturation	40.9	%		0.1		USDA27a	11/30/05 15:18 / srm

Report Definitions:
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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111047-013
Client Sample ID: No. 1 1-C, 4-5'

Report Date: 12/02/05
Collection Date: 05/11/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	32	wt%		2		ASA15-5	11/30/05 15:18 / srm
Sand	42	%		1		ASA15-5	12/01/05 10:45 / srm
Silt	34	%		1		ASA15-5	12/01/05 10:45 / srm
Clay	24	%		1		ASA15-5	12/01/05 10:45 / srm
Texture	L					ASA15-5	12/01/05 10:45 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	2.90	s.u.		0.10		ASAM10-3.2	11/30/05 15:18 / srm
Conductivity, sat. paste	5.43	mmhos/cm		0.01		ASA10-3	11/30/05 15:18 / srm
Saturation	42.8	%		0.1		USDA27a	11/30/05 15:18 / srm

Report Definitions:
RL - Analyte reporting limit.
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MCL - Maximum contaminant level.
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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111047-014
Client Sample ID: No. 1 2-A, (0-2')

Report Date: 12/02/05
Collection Date: 05/12/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	42	wt%		2		ASA15-5	11/30/05 15:18 / srm
Sand	50	%		1		ASA15-5	12/01/05 10:45 / srm
Silt	28	%		1		ASA15-5	12/01/05 10:45 / srm
Clay	22	%		1		ASA15-5	12/01/05 10:45 / srm
Texture	L					ASA15-5	12/01/05 10:45 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	3.10	s.u.		0.10		ASAM10-3.2	11/30/05 15:18 / srm
Conductivity, sat. paste	7.80	mmhos/cm		0.01		ASA10-3	11/30/05 15:18 / srm
Saturation	41.4	%		0.1		USDA27a	11/30/05 15:18 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111047-015
Client Sample ID: No. 1 2-A, (3-4')

Report Date: 12/02/05
Collection Date: 05/12/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	49	wt%		2		ASA15-5	11/30/05 15:18 / srm
Sand	50	%		1		ASA15-5	12/01/05 10:45 / srm
Silt	28	%		1		ASA15-5	12/01/05 10:45 / srm
Clay	22	%		1		ASA15-5	12/01/05 10:45 / srm
Texture	L					ASA15-5	12/01/05 10:45 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	3.00	s.u.		0.10		ASAM10-3.2	11/30/05 15:18 / srm
Conductivity, sat. paste	8.17	mmhos/cm		0.01		ASA10-3	11/30/05 15:18 / srm
Saturation	38.7	%		0.1		USDA27a	11/30/05 15:18 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111047-016
Client Sample ID: No. 1 3-B, (0-2')

Report Date: 12/02/05
Collection Date: 05/12/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	37	wt%		2		ASA15-5	11/30/05 15:18 / srm
Sand	54	%		1		ASA15-5	12/01/05 10:45 / srm
Silt	25	%		1		ASA15-5	12/01/05 10:45 / srm
Clay	21	%		1		ASA15-5	12/01/05 10:45 / srm
Texture	SCL					ASA15-5	12/01/05 10:45 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	2.50	s.u.		0.10		ASAM10-3.2	11/30/05 15:18 / srm
Conductivity, sat. paste	6.53	mmhos/cm		0.01		ASA10-3	11/30/05 15:18 / srm
Saturation	33.7	%		0.1		USDA27a	11/30/05 15:18 / srm

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111047-017
Client Sample ID: No. 1 3-B, (2-3')

Report Date: 12/02/05
Collection Date: 05/12/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	45	wt%		2		ASA15-5	11/30/05 15:18 / srm
Sand	48	%		1		ASA15-5	12/01/05 10:45 / srm
Silt	29	%		1		ASA15-5	12/01/05 10:45 / srm
Clay	23	%		1		ASA15-5	12/01/05 10:45 / srm
Texture	L					ASA15-5	12/01/05 10:45 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	2.70	s.u.		0.10		ASAM10-3.2	11/30/05 15:18 / srm
Conductivity, sat. paste	6.01	mmhos/cm		0.01		ASA10-3	11/30/05 15:18 / srm
Saturation	32.8	%		0.1		USDA27a	11/30/05 15:18 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111047-018
Client Sample ID: No. 1 3-C, (0-2')

Report Date: 12/02/05
Collection Date: 05/12/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	53	wt%		2		ASA15-5	11/30/05 15:18 / srm
Sand	47	%		1		ASA15-5	12/01/05 10:45 / srm
Silt	31	%		1		ASA15-5	12/01/05 10:45 / srm
Clay	22	%		1		ASA15-5	12/01/05 10:45 / srm
Texture	L					ASA15-5	12/01/05 10:45 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	3.10	s.u.		0.10		ASAM10-3.2	11/30/05 15:18 / srm
Conductivity, sat. paste	8.56	mmhos/cm		0.01		ASA10-3	11/30/05 15:18 / srm
Saturation	37.9	%		0.1		USDA27a	11/30/05 15:18 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111047-019
Client Sample ID: No. 1 3-C, (2-3')

Report Date: 12/02/05
Collection Date: 05/12/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	52	wt%		2		ASA15-5	11/30/05 15:18 / srm
Sand	50	%		1		ASA15-5	12/01/05 10:45 / srm
Silt	25	%		1		ASA15-5	12/01/05 10:45 / srm
Clay	25	%		1		ASA15-5	12/01/05 10:45 / srm
Texture	SCL					ASA15-5	12/01/05 10:45 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	3.20	s u		0.10		ASAM10-3.2	11/30/05 15:18 / srm
Conductivity, sat. paste	8.44	mmhos/cm		0.01		ASA10-3	11/30/05 15:18 / srm
Saturation	39.2	%		0.1		USDA27a	11/30/05 15:18 / srm

Report Definitions:
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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111047-020
Client Sample ID: No. 1 4-A, 0-2'

Report Date: 12/02/05
Collection Date: 05/12/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	41	wt%		2		ASA15-5	11/30/05 15:18 / srm
Sand	46	%		1		ASA15-5	12/01/05 10:45 / srm
Silt	28	%		1		ASA15-5	12/01/05 10:45 / srm
Clay	26	%		1		ASA15-5	12/01/05 10:45 / srm
Texture	L					ASA15-5	12/01/05 10:45 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	2.60	s.u.		0.10		ASAM10-3.2	11/30/05 15:18 / srm
Conductivity, sat. paste	7.21	mmhos/cm		0.01		ASA10-3	11/30/05 15:18 / srm
Saturation	40.1	%		0.1		USDA27a	11/30/05 15:18 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111047-021
Client Sample ID: No. 1 4-A, 2-3'

Report Date: 12/02/05
Collection Date: 05/12/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	36	wt%		2		ASA15-5	11/30/05 15:18 / srm
Sand	46	%		1		ASA15-5	12/01/05 10:45 / srm
Silt	29	%		1		ASA15-5	12/01/05 10:45 / srm
Clay	25	%		1		ASA15-5	12/01/05 10:45 / srm
Texture	L					ASA15-5	12/01/05 10:45 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	2.50	s.u.		0.10		ASAM10-3.2	11/30/05 15:18 / srm
Conductivity, sat. paste	7.21	mmhos/cm		0.01		ASA10-3	11/30/05 15:18 / srm
Saturation	39.4	%		0.1		USDA27a	11/30/05 15:18 / srm

Report Definitions:
RL - Analyte reporting limit
QCL - Quality control limit
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111047-022
Client Sample ID: No. 1 4-A, 4-5'

Report Date: 12/02/05
Collection Date: 05/12/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	37	wt%		2		ASA15-5	11/30/05 15:18 / srm
Sand	46	%		1		ASA15-5	12/01/05 10:45 / srm
Silt	27	%		1		ASA15-5	12/01/05 10:45 / srm
Clay	27	%		1		ASA15-5	12/01/05 10:45 / srm
Texture	SCL					ASA15-5	12/01/05 10:45 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	2.70	s.u.		0.10		ASAM10-3.2	11/30/05 15:18 / srm
Conductivity, sat. paste	7.12	mmhos/cm		0.01		ASA10-3	11/30/05 15:18 / srm
Saturation	41.4	%		0.1		USDA27a	11/30/05 15:18 / srm

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111047-023
Client Sample ID: No. 1 5-A, 0-2'

Report Date: 12/02/05
Collection Date: 05/12/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	47	wt%		2		ASA15-5	11/30/05 15:18 / srm
Sand	47	%		1		ASA15-5	12/01/05 10:45 / srm
Silt	27	%		1		ASA15-5	12/01/05 10:45 / srm
Clay	26	%		1		ASA15-5	12/01/05 10:45 / srm
Texture	SCL					ASA15-5	12/01/05 10:45 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	2.80	s.u.		0.10		ASAM10-3.2	11/30/05 15:18 / srm
Conductivity, sat. paste	5.75	mmhos/cm		0.01		ASA10-3	11/30/05 15:18 / srm
Saturation	42.3	%		0.1		USDA27a	11/30/05 15:18 / srm

Report Definitions:
RL - Analyte reporting limit.
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MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111047-024
Client Sample ID: No. 1 5-A, 3-4'

Report Date: 12/02/05
Collection Date: 05/12/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	51	wt%		2		ASA15-5	11/30/05 15:18 / srm
Sand	47	%		1		ASA15-5	12/01/05 10:45 / srm
Silt	27	%		1		ASA15-5	12/01/05 10:45 / srm
Clay	26	%		1		ASA15-5	12/01/05 10:45 / srm
Texture	SCL					ASA15-5	12/01/05 10:45 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	2.40	s.u.		0.10		ASAM10-3.2	11/30/05 15:18 / srm
Conductivity, sat. paste	7.77	mmhos/cm		0.01		ASA10-3	11/30/05 15:18 / srm
Saturation	40.3	%		0.1		USDA27a	11/30/05 15:18 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111047-025
Client Sample ID: No. 1 6-A, 0-2'

Report Date: 12/02/05
Collection Date: 05/12/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	45	wt%		2		ASA15-5	11/30/05 15:18 / srm
Sand	47	%		1		ASA15-5	12/01/05 10:45 / srm
Silt	28	%		1		ASA15-5	12/01/05 10:45 / srm
Clay	25	%		1		ASA15-5	12/01/05 10:45 / srm
Texture	L					ASA15-5	12/01/05 10:45 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	2.80	s.u.		0.10		ASAM10-3.2	11/30/05 15:18 / srm
Conductivity, sat. paste	6.30	mmhos/cm		0.01		ASA10-3	11/30/05 15:18 / srm
Saturation	40.3	%		0.1		USDA27a	11/30/05 15:18 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111047-026
Client Sample ID: No. 1 6-A, 2-3'

Report Date: 12/02/05
Collection Date: 05/12/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	47	wt%		2		ASA15-5	11/30/05 15:18 / srm
Sand	46	%		1		ASA15-5	12/01/05 10:45 / srm
Silt	29	%		1		ASA15-5	12/01/05 10:45 / srm
Clay	25	%		1		ASA15-5	12/01/05 10:45 / srm
Texture	L					ASA15-5	12/01/05 10:45 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	2.80	s.u.		0.10		ASAM10-3.2	11/30/05 15:18 / srm
Conductivity, sat. paste	5.45	mmhos/cm		0.01		ASA10-3	11/30/05 15:18 / srm
Saturation	39.9	%		0.1		USDA27a	11/30/05 15:18 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111047-027
Client Sample ID: No. 1 7-A, 0-2'

Report Date: 12/02/05
Collection Date: 05/12/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	51	wt%		2		ASA15-5	11/30/05 15:18 / srm
Sand	52	%		1		ASA15-5	12/01/05 10:45 / srm
Silt	25	%		1		ASA15-5	12/01/05 10:45 / srm
Clay	23	%		1		ASA15-5	12/01/05 10:45 / srm
Texture	SCL					ASA15-5	12/01/05 10:45 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	2.00	s.u.		0.10		ASAM10-3.2	11/30/05 15:18 / srm
Conductivity, sat. paste	9.41	mmhos/cm		0.01		ASA10-3	11/30/05 15:18 / srm
Saturation	30.8	%		0.1		USDA27a	11/30/05 15:18 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111047-028
Client Sample ID: No. 1 7-A, 2-3'

Report Date: 12/02/05
Collection Date: 05/12/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	49	wt%		2		ASA15-5	11/30/05 15:18 / srm
Sand	50	%		1		ASA15-5	12/01/05 10:45 / srm
Silt	24	%		1		ASA15-5	12/01/05 10:45 / srm
Clay	26	%		1		ASA15-5	12/01/05 10:45 / srm
Texture	SCL					ASA15-5	12/01/05 10:45 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	2.20	s.u.		0.10		ASAM10-3.2	11/30/05 15:18 / srm
Conductivity, sat. paste	7.94	mmhos/cm		0.01		ASA10-3	11/30/05 15:18 / srm
Saturation	34.8	%		0.1		USDA27a	11/30/05 15:18 / srm

Report Definitions:
RL - Analyte reporting limit.
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MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111047-029
Client Sample ID: No. 1 7-A, 4-5'

Report Date: 12/02/05
Collection Date: 05/12/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	53	wt%		2		ASA15-5	11/30/05 15:18 / srm
Sand	50	%		1		ASA15-5	12/01/05 10:45 / srm
Silt	24	%		1		ASA15-5	12/01/05 10:45 / srm
Clay	26	%		1		ASA15-5	12/01/05 10:45 / srm
Texture	SCL					ASA15-5	12/01/05 10:45 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	2.40	s.u.		0.10		ASAM10-3.2	11/30/05 15:18 / srm
Conductivity, sat. paste	6.86	mmhos/cm		0.01		ASA10-3	11/30/05 15:18 / srm
Saturation	34.6	%		0.1		USDA27a	11/30/05 15:18 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111047-030
Client Sample ID: No. 1 8-A, 0-2'

Report Date: 12/02/05
Collection Date: 05/05/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	52	wt%		2		ASA15-5	11/30/05 15:18 / srm
Sand	48	%		1		ASA15-5	12/01/05 10:45 / srm
Silt	28	%		1		ASA15-5	12/01/05 10:45 / srm
Clay	24	%		1		ASA15-5	12/01/05 10:45 / srm
Texture	L					ASA15-5	12/01/05 10:45 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	2.70	s.u.		0.10		ASAM10-3.2	11/30/05 15:18 / srm
Conductivity, sat. paste	5.32	mmhos/cm		0.01		ASA10-3	11/30/05 15:18 / srm
Saturation	37.0	%		0.1		USDA27a	11/30/05 15:18 / srm

Report Definitions:
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QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111047-031
Client Sample ID: No. 1 8-A, 3-4'

Report Date: 12/02/05
Collection Date: 05/05/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	46	wt%		2		ASA15-5	11/30/05 15:18 / srm
Sand	46	%		1		ASA15-5	12/01/05 10:45 / srm
Silt	29	%		1		ASA15-5	12/01/05 10:45 / srm
Clay	25	%		1		ASA15-5	12/01/05 10:45 / srm
Texture	L					ASA15-5	12/01/05 10:45 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	2.80	s.u.		0.10		ASAM10-3.2	11/30/05 15:18 / srm
Conductivity, sat. paste	5.74	mmhos/cm		0.01		ASA10-3	11/30/05 15:18 / srm
Saturation	39.6	%		0.1		USDA27a	11/30/05 15:18 / srm

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111047-032
Client Sample ID: No. 1 9-A, 0-2'

Report Date: 12/02/05
Collection Date: 05/12/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	58	wt%		2		ASA15-5	11/30/05 15:18 / srm
Sand	51	%		1		ASA15-5	12/01/05 10:45 / srm
Silt	25	%		1		ASA15-5	12/01/05 10:45 / srm
Clay	24	%		1		ASA15-5	12/01/05 10:45 / srm
Texture	SCL					ASA15-5	12/01/05 10:45 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	2.10	s.u.		0.10		ASAM10-3.2	11/30/05 15:18 / srm
Conductivity, sat. paste	11.4	mmhos/cm		0.01		ASA10-3	11/30/05 15:18 / srm
Saturation	31.8	%		0.1		USDA27a	11/30/05 15:18 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111047-033
Client Sample ID: No. 1 9-A, 2-3'

Report Date: 12/02/05
Collection Date: 05/12/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	60	wt%		2		ASA15-5	11/30/05 15:18 / srm
Sand	58	%		1		ASA15-5	12/01/05 10:45 / srm
Silt	22	%		1		ASA15-5	12/01/05 10:45 / srm
Clay	20	%		1		ASA15-5	12/01/05 10:45 / srm
Texture	SCL					ASA15-5	12/01/05 10:45 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	3.20	s.u.		0.10		ASAM10-3.2	11/30/05 15:18 / srm
Conductivity, sat. paste	10.3	mmhos/cm		0.01		ASA10-3	11/30/05 15:18 / srm
Saturation	27.7	%		0.1		USDA27a	11/30/05 15:18 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111047-034
Client Sample ID: No. 1 10-A, 0-2'

Report Date: 12/02/05
Collection Date: Not Provided
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	49	wt%		2		ASA15-5	11/30/05 15:18 / srm
Sand	46	%		1		ASA15-5	12/01/05 10:45 / srm
Silt	28	%		1		ASA15-5	12/01/05 10:45 / srm
Clay	26	%		1		ASA15-5	12/01/05 10:45 / srm
Texture	L					ASA15-5	12/01/05 10:45 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	3.00	s.u.		0.10		ASAM10-3.2	11/30/05 15:18 / srm
Conductivity, sat. paste	6.28	mmhos/cm		0.01		ASA10-3	11/30/05 15:18 / srm
Saturation	44.0	%		0.1		USDA27a	11/30/05 15:18 / srm

Report Definitions:
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MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111047-035
Client Sample ID: No. 1 10-A, 3-4'

Report Date: 12/02/05
Collection Date: Not Provided
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	47	wt%		2		ASA15-5	11/30/05 15:18 / srm
Sand	48	%		1		ASA15-5	12/01/05 10:45 / srm
Silt	28	%		1		ASA15-5	12/01/05 10:45 / srm
Clay	24	%		1		ASA15-5	12/01/05 10:45 / srm
Texture	L					ASA15-5	12/01/05 10:45 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	2.90	s.u.		0.10		ASAM10-3.2	11/30/05 15:18 / srm
Conductivity, sat. paste	6.70	mmhos/cm		0.01		ASA10-3	11/30/05 15:18 / srm
Saturation	43.2	%		0.1		USDA27a	11/30/05 15:18 / srm

Report Definitions:
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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111047-036
Client Sample ID: No. 1 10-A, 4-5'

Report Date: 12/02/05
Collection Date: Not Provided
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	43	wt%		2		ASA15-5	11/30/05 15:18 / srm
Sand	46	%		1		ASA15-5	12/01/05 10:45 / srm
Silt	28	%		1		ASA15-5	12/01/05 10:45 / srm
Clay	26	%		1		ASA15-5	12/01/05 10:45 / srm
Texture	L					ASA15-5	12/01/05 10:45 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	2.80	s.u.		0.10		ASAM10-3.2	11/30/05 15:18 / srm
Conductivity, sat. paste	7.10	mmhos/cm		0.01		ASA10-3	11/30/05 15:18 / srm
Saturation	41.6	%		0.1		USDA27a	11/30/05 15:18 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111047-037
Client Sample ID: No. 1 10-A, 6-7'

Report Date: 12/02/05
Collection Date: Not Provided
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	46	wt%		2		ASA15-5	11/30/05 15:18 / srm
Sand	51	%		1		ASA15-5	12/01/05 10:45 / srm
Silt	27	%		1		ASA15-5	12/01/05 10:45 / srm
Clay	22	%		1		ASA15-5	12/01/05 10:45 / srm
Texture	SCL					ASA15-5	12/01/05 10:45 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	2.80	s.u.		0.10		ASAM10-3.2	11/30/05 15:18 / srm
Conductivity, sat. paste	6.51	mmhos/cm		0.01		ASA10-3	11/30/05 15:18 / srm
Saturation	40.5	%		0.1		USDA27a	11/30/05 15:18 / srm

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111047-038
Client Sample ID: No. 1 Lys 1-A, 0-2'

Report Date: 12/02/05
Collection Date: 05/10/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	50	wt%		2		ASA15-5	11/30/05 15:18 / srm
Sand	50	%		1		ASA15-5	12/01/05 10:45 / srm
Silt	24	%		1		ASA15-5	12/01/05 10:45 / srm
Clay	26	%		1		ASA15-5	12/01/05 10:45 / srm
Texture	SCL					ASA15-5	12/01/05 10:45 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	2.60	s.u.		0.10		ASAM10-3.2	11/30/05 15:18 / srm
Conductivity, sat. paste	9.39	mmhos/cm		0.01		ASA10-3	11/30/05 15:18 / srm
Saturation	42.2	%		0.1		USDA27a	11/30/05 15:18 / srm

Report Definitions:
RL - Analyte reporting limit.
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MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111047-039
Client Sample ID: No. 1 Lys 1-A, 2-3'

Report Date: 12/02/05
Collection Date: 05/10/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	41	wt%		2		ASA15-5	11/30/05 15:18 / srm
Sand	50	%		1		ASA15-5	12/01/05 10:45 / srm
Silt	24	%		1		ASA15-5	12/01/05 10:45 / srm
Clay	26	%		1		ASA15-5	12/01/05 10:45 / srm
Texture	SCL					ASA15-5	12/01/05 10:45 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	2.50	s.u.		0.10		ASAM10-3.2	11/30/05 15:18 / srm
Conductivity, sat. paste	10.8	mmhos/cm		0.01		ASA10-3	11/30/05 15:18 / srm
Saturation	41.1	%		0.1		USDA27a	11/30/05 15:18 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Tyrone No. 1 Test Plots, 053-2377
Lab ID: B05111047-040
Client Sample ID: No. 1 Lys 1-A, 4-5'

Report Date: 12/02/05
Collection Date: 05/10/05
Date Received: 11/15/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	47	wt%		2		ASA15-5	11/30/05 15:18 / srm
Sand	46	%		1		ASA15-5	12/01/05 10:45 / srm
Silt	27	%		1		ASA15-5	12/01/05 10:45 / srm
Clay	27	%		1		ASA15-5	12/01/05 10:45 / srm
Texture	SCL					ASA15-5	12/01/05 10:45 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	2.70	s.u.		0.10		ASAM10-3.2	11/30/05 15:18 / srm
Conductivity, sat. paste	10.6	mmhos/cm		0.01		ASA10-3	11/30/05 15:18 / srm
Saturation	42.0	%		0.1		USDA27a	11/30/05 15:18 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

Energy Laboratories Inc

Sample Receipt Checklist

Client Name Golder Associates Inc

Date and Time Received: 11/15/2005

Work Order Number B05111047

Received by sba

Checklist completed by: _____ 11-15-05 (Signature / Date)

Reviewed by _____ (Initials) _____ (Date)

Carrier name UPS ARS Ground

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☐	No ☑	13 °C
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Not Applicable ☑

Adjusted? _____ Checked by _____

Any No and/or NA (not applicable) response must be detailed in the comments section below.

Client contacted _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding: _____

Comments:

Corrective Action _____

Energy Laboratories Inc

WORK ORDER Summary

B05111047

Work Order: B05111047

Date Received: *11/15/2005*

Client ID: GLDR-ASSCTS-INC **Client Name:** Golder Associates Inc

Project: Tyrone No. 1 Test plots, 053-2377 **QC Level:** STD

Workorder Comments:

Client Comments: 4/15/05-send all invoices to Nick Schneider

Sample ID	Client Sample ID	Collection Date	Date Received	Date Due	Matrix	Frac	RT	Done	Test Code	Hold	MS	SEL	Storage
B05111047-001	No.1 LYS 3-A, 0-2'	5/11/2005	11/15/2005	12/1/2005	Soil	A	☐	☐	CF-S	☐	☐	☐	SOIL
						A	☐	☐	COND-S	☐	☐	☑	SOIL
						A	☐	☐	PH-SAT-PASTE-S	☐	☐	☐	SOIL
						A	☐	☐	PSA-S	☐	☐	☐	SOIL
						A	☐	☐	SAT-S	☐	☐	☐	SOIL
						A	☐	☐	SOILREVIEW	☐	☐	☐	SOIL
						A	☐	☐	TEXTURE-S	☐	☐	☐	SOIL
B05111047-002	No. 1 Lys-3A, 0-2'	5/11/2005	11/15/2005		Soil		☐	☐	Same as previous sample	☐	☐	☐	
B05111047-003	No. 1 8-A Lys Top, 6' bgs	5/4/2005	11/15/2005		Soil		☐	☐	Same as previous sample	☐	☐	☐	
B05111047-004	No. 1 8-A Lys Mid 8' bgs	5/4/2005	11/15/2005		Soil		☐	☐	Same as previous sample	☐	☐	☐	
B05111047-005	No. 1 TP-8, 4' bgs	5/4/2005	11/15/2005		Soil		☐	☐	Same as previous sample	☐	☐	☐	
B05111047-006	No. 1 TP-8, 6' bgs	5/4/2005	11/15/2005		Soil		☐	☐	Same as previous sample	☐	☐	☐	
B05111047-007	No. 1 TP-8, 8' bgs	5/4/2005	11/15/2005		Soil		☐	☐	Same as previous sample	☐	☐	☐	
B05111047-008	No. 1 1-B, 0-2'	5/11/2005	11/15/2005		Soil		☐	☐	Same as previous sample	☐	☐	☐	
B05111047-009	No. 1 1-B, 2-3'	5/11/2005	11/15/2005		Soil		☐	☐	Same as previous sample	☐	☐	☐	
B05111047-010	No. 1 1-B', 4-5'	5/11/2005	11/15/2005		Soil		☐	☐	Same as previous sample	☐	☐	☐	
B05111047-011	No. 1 1-C, 0-2'	5/11/2005	11/15/2005		Soil		☐	☐	Same as previous sample	☐	☐	☐	
B05111047-012	No. 1 1-C, 2-3'	5/11/2005	11/15/2005		Soil		☐	☐	Same as previous sample	☐	☐	☐	
B05111047-013	No. 1 1-C, 4-5'	5/11/2005	11/15/2005		Soil		☐	☐	Same as previous sample	☐	☐	☐	
B05111047-014	No. 1 2-A, (0-2')	5/12/2005	11/15/2005		Soil		☐	☐	Same as previous sample	☐	☐	☐	

12-1-05 Done S

12-02-05A09:22 RCVD

EDD emailed to Lewis Mink 12/01/05 AS

WORK ORDER Summary

Work Order:

Date Received: *11/15/2005*

Client ID: **Client Name:**

Project: **QC Level:**

Workorder Comments:

Client Comments:

Sample ID	Client Sample ID	Collection Date	Date Received	Date Due	Matrix	Frac	RT	Done	Test Code	Hold	MS	SEL	Storage
B05111047-015	No. 1 2-A, (3-4')	5/12/2005	11/15/2005		Soil	☐	☐	Same as previous sample		☐	☐	☐	
B05111047-016	No. 1 3-B, (0-2')	5/12/2005	11/15/2005		Soil	☐	☐	Same as previous sample		☐	☐	☐	
B05111047-017	No. 1 3-B, (2-3')	5/12/2005	11/15/2005		Soil	☐	☐	Same as previous sample		☐	☐	☐	
B05111047-018	No. 1 3-C, (0-2')	5/12/2005	11/15/2005		Soil	☐	☐	Same as previous sample		☐	☐	☐	
B05111047-019	No. 1 3-C, (2-3')	5/12/2005	11/15/2005		Soil	☐	☐	Same as previous sample		☐	☐	☐	
B05111047-020	No. 1 4-A, 0-2'	5/12/2005	11/15/2005		Soil	☐	☐	Same as previous sample		☐	☐	☐	
B05111047-021	No. 1 4-A, 2-3'	5/12/2005	11/15/2005		Soil	☐	☐	Same as previous sample		☐	☐	☐	
B05111047-022	No. 1 4-A, 4-5'	5/12/2005	11/15/2005		Soil	☐	☐	Same as previous sample		☐	☐	☐	
B05111047-023	No. 1 5-A, 0-2'	5/12/2005	11/15/2005		Soil	☐	☐	Same as previous sample		☐	☐	☐	
B05111047-024	No. 1 5-A, 3-4'	5/12/2005	11/15/2005		Soil	☐	☐	Same as previous sample		☐	☐	☐	
B05111047-025	No. 1 6-A, 0-2'	5/12/2005	11/15/2005		Soil	☐	☐	Same as previous sample		☐	☐	☐	
B05111047-026	No. 1 6-A, 2-3'	5/12/2005	11/15/2005		Soil	☐	☐	Same as previous sample		☐	☐	☐	
B05111047-027	No. 1 7-A, 0-2'	5/12/2005	11/15/2005		Soil	☐	☐	Same as previous sample		☐	☐	☐	
B05111047-028	No. 1 7-A, 2-3'	5/12/2005	11/15/2005		Soil	☐	☐	Same as previous sample		☐	☐	☐	
B05111047-029	No. 1 7-A, 4-5'	5/12/2005	11/15/2005		Soil	☐	☐	Same as previous sample		☐	☐	☐	
B05111047-030	No. 1 8-A, 0-2'	5/5/2005	11/15/2005		Soil	☐	☐	Same as previous sample		☐	☐	☐	
B05111047-031	No. 1 8-A, 3-4'	5/5/2005	11/15/2005		Soil	☐	☐	Same as previous sample		☐	☐	☐	
B05111047-032	No. 1 9-A, 0-2'	5/12/2005	11/15/2005		Soil	☐	☐	Same as previous sample		☐	☐	☐	
B05111047-033	No. 1 9-A, 2-3'	5/12/2005	11/15/2005		Soil	☐	☐	Same as previous sample		☐	☐	☐	
B05111047-034	No. 1 10-A, 0-2'		11/15/2005		Soil	☐	☐	Same as previous sample		☐	☐	☐	

WORK ORDER Summary

Work Order:

Date Received: *11/15/2005*

Client ID: **Client Name:**

Project: **QC Level:**

Workorder Comments:

Client Comments:

Sample ID	Client Sample ID	Collection Date	Date Received	Date Due	Matrix	Frac	RT	Done	Test Code	Hold	MS	SEL	Storage
B05111047-035	No. 1 10-A, 3-4'		11/15/2005		Soil		☐	☐	Same as previous sample	☐	☐	☐	
B05111047-036	No. 1 10-A, 4-5'		11/15/2005		Soil		☐	☐	Same as previous sample	☐	☐	☐	
B05111047-037	No. 1 10-A, 0-2'		11/15/2005		Soil		☐	☐	Same as previous sample	☐	☐	☐	
B05111047-038	No. 1 Lys 1-A, 0-2'	5/10/2005	11/15/2005		Soil		☐	☐	Same as previous sample	☐	☐	☐	
B05111047-039	No. 1 Lys 1-A, 2-3'	5/10/2005	11/15/2005		Soil		☐	☐	Same as previous sample	☐	☐	☐	
B05111047-040	No. 1 Lys 1-A, 4-5'	5/10/2005	11/15/2005		Soil		☐	☐	Same as previous sample	☐	☐	☐	

Review List For Work Order B05111047

SampID	TestCode	SEL	Analytes	MDL	PQL	MCL	Units	Report Title	AnalCode
B05111047-001A	CF-S	☐							
	COND-S	☑							
		☑	Conductivity, sat. paste	0	0.01	0	mmhos/cm		
	PH-SAT-PASTE-S	☐							
	PSA-S	☐							
	SAT-S	☐							
	SOILREVIEW	☐							
	TEXTURE-S	☐							
B05111047-002A	CF-S	☐							
	COND-S	☐							
	PH-SAT-PASTE-S	☐							
	PSA-S	☐							
	SAT-S	☐							
	TEXTURE-S	☐							
B05111047-003A	CF-S	☐							
	COND-S	☐							
	PH-SAT-PASTE-S	☐							
	PSA-S	☐							
	SAT-S	☐							
	TEXTURE-S	☐							
B05111047-004A	CF-S	☐							
	COND-S	☐							
	PH-SAT-PASTE-S	☐							
	PSA-S	☐							
	SAT-S	☐							
	TEXTURE-S	☐							
B05111047-005A	CF-S	☐							
	COND-S	☐							
	PH-SAT-PASTE-S	☐							
	PSA-S	☐							
	SAT-S	☐							
	TEXTURE-S	☐							
B05111047-006A	CF-S	☐							
	COND-S	☐							
	PH-SAT-PASTE-S	☐							
	PSA-S	☐							
	SAT-S	☐							
	TEXTURE-S	☐							
B05111047-007A	CF-S	☐							
	COND-S	☐							

Bolded analytes are "X" analytes
Wednesday, November 16, 2005

SampID	TestCode	SEL	Analytes	MDL	PQL	MCL	Units	Report Title	AnalCode
B05111047-007A	PH-SAT-PASTE-S	☐							
	PSA-S	☐							
	SAT-S	☐							
	TEXTURE-S	☐							
B05111047-008A	CF-S	☐							
	COND-S	☐							
	PH-SAT-PASTE-S	☐							
	PSA-S	☐							
	SAT-S	☐							
	TEXTURE-S	☐							
B05111047-009A	CF-S	☐							
	COND-S	☐							
	PH-SAT-PASTE-S	☐							
	PSA-S	☐							
	SAT-S	☐							
	TEXTURE-S	☐							
B05111047-010A	CF-S	☐							
	COND-S	☐							
	PH-SAT-PASTE-S	☐							
	PSA-S	☐							
	SAT-S	☐							
	TEXTURE-S	☐							
B05111047-011A	CF-S	☐							
	COND-S	☐							
	PH-SAT-PASTE-S	☐							
	PSA-S	☐							
	SAT-S	☐							
	TEXTURE-S	☐							
B05111047-012A	CF-S	☐							
	COND-S	☐							
	PH-SAT-PASTE-S	☐							
	PSA-S	☐							
	SAT-S	☐							
	TEXTURE-S	☐							
B05111047-013A	CF-S	☐							
	COND-S	☐							
	PH-SAT-PASTE-S	☐							
	PSA-S	☐							
	SAT-S	☐							
	TEXTURE-S	☐							
B05111047-014A	CF-S	☐							
	COND-S	☐							
	PH-SAT-PASTE-S	☐							
	PSA-S	☐							

Bolded analytes are "X" analytes

SampID	TestCode	SEL	Analytes	MDL	PQL	MCL	Units	Report Title	AnalCode
B05111047-014A	SAT-S	☐							
	TEXTURE-S	☐							
B05111047-015A	CF-S	☐							
	COND-S	☐							
	PH-SAT-PASTE-S	☐							
	PSA-S	☐							
	SAT-S	☐							
	TEXTURE-S	☐							
B05111047-016A	CF-S	☐							
	COND-S	☐							
	PH-SAT-PASTE-S	☐							
	PSA-S	☐							
	SAT-S	☐							
	TEXTURE-S	☐							
B05111047-017A	CF-S	☐							
	COND-S	☐							
	PH-SAT-PASTE-S	☐							
	PSA-S	☐							
	SAT-S	☐							
	TEXTURE-S	☐							
B05111047-018A	CF-S	☐							
	COND-S	☐							
	PH-SAT-PASTE-S	☐							
	PSA-S	☐							
	SAT-S	☐							
	TEXTURE-S	☐							
B05111047-019A	CF-S	☐							
	COND-S	☐							
	PH-SAT-PASTE-S	☐							
	PSA-S	☐							
	SAT-S	☐							
	TEXTURE-S	☐							
B05111047-020A	CF-S	☐							
	COND-S	☐							
	PH-SAT-PASTE-S	☐							
	PSA-S	☐							
	SAT-S	☐							
	TEXTURE-S	☐							
B05111047-021A	CF-S	☐							
	COND-S	☐							
	PH-SAT-PASTE-S	☐							
	PSA-S	☐							
	SAT-S	☐							
	TEXTURE-S	☐							

Bolded analytes are "X" analytes
Wednesday, November 16, 2005

SampID	TestCode	SEL	Analytes	MDL	PQL	MCL	Units	Report Title	AnalCode
B05111047-022A	CF-S	☐							
	COND-S	☐							
	PH-SAT-PASTE-S	☐							
	PSA-S	☐							
	SAT-S	☐							
	TEXTURE-S	☐							
B05111047-023A	CF-S	☐							
	COND-S	☐							
	PH-SAT-PASTE-S	☐							
	PSA-S	☐							
	SAT-S	☐							
	TEXTURE-S	☐							
B05111047-024A	CF-S	☐							
	COND-S	☐							
	PH-SAT-PASTE-S	☐							
	PSA-S	☐							
	SAT-S	☐							
	TEXTURE-S	☐							
B05111047-025A	CF-S	☐							
	COND-S	☐							
	PH-SAT-PASTE-S	☐							
	PSA-S	☐							
	SAT-S	☐							
	TEXTURE-S	☐							
B05111047-026A	CF-S	☐							
	COND-S	☐							
	PH-SAT-PASTE-S	☐							
	PSA-S	☐							
	SAT-S	☐							
	TEXTURE-S	☐							
B05111047-027A	CF-S	☐							
	COND-S	☐							
	PH-SAT-PASTE-S	☐							
	PSA-S	☐							
	SAT-S	☐							
	TEXTURE-S	☐							
B05111047-028A	CF-S	☐							
	COND-S	☐							
	PH-SAT-PASTE-S	☐							
	PSA-S	☐							
	SAT-S	☐							
	TEXTURE-S	☐							
B05111047-029A	CF-S	☐							

Bolded analytes are "X" analytes
Wednesday, November 16, 2005

SampID	TestCode	SEL	Analytes	MDL	PQL	MCL	Units	Report Title	AnalCode
B05111047-029A	COND-S	☐							
	PH-SAT-PASTE-S	☐							
	PSA-S	☐							
	SAT-S	☐							
	TEXTURE-S	☐							
B05111047-030A	CF-S	☐							
	COND-S	☐							
	PH-SAT-PASTE-S	☐							
	PSA-S	☐							
	SAT-S	☐							
	TEXTURE-S	☐							
B05111047-031A	CF-S	☐							
	COND-S	☐							
	PH-SAT-PASTE-S	☐							
	PSA-S	☐							
	SAT-S	☐							
	TEXTURE-S	☐							
B05111047-032A	CF-S	☐							
	COND-S	☐							
	PH-SAT-PASTE-S	☐							
	PSA-S	☐							
	SAT-S	☐							
	TEXTURE-S	☐							
B05111047-033A	CF-S	☐							
	COND-S	☐							
	PH-SAT-PASTE-S	☐							
	PSA-S	☐							
	SAT-S	☐							
	TEXTURE-S	☐							
B05111047-034A	CF-S	☐							
	COND-S	☐							
	PH-SAT-PASTE-S	☐							
	PSA-S	☐							
	SAT-S	☐							
	TEXTURE-S	☐							
B05111047-035A	CF-S	☐							
	COND-S	☐							
	PH-SAT-PASTE-S	☐							
	PSA-S	☐							
	SAT-S	☐							
	TEXTURE-S	☐							
B05111047-036A	CF-S	☐							
	COND-S	☐							
	PH-SAT-PASTE-S	☐							

Bolded analytes are "X" analytes
Wednesday, November 16, 2005

SampID	TestCode	SEL	Analytes	MDL	PQL	MCL	Units	Report Title	AnalCode
B05111047-036A	PSA-S	☐							
	SAT-S	☐							
	TEXTURE-S	☐							
B05111047-037A	CF-S	☐							
	COND-S	☐							
	PH-SAT-PASTE-S	☐							
	PSA-S	☐							
	SAT-S	☐							
	TEXTURE-S	☐							
B05111047-038A	CF-S	☐							
	COND-S	☐							
	PH-SAT-PASTE-S	☐							
	PSA-S	☐							
	SAT-S	☐							
	TEXTURE-S	☐							
B05111047-039A	CF-S	☐							
	COND-S	☐							
	PH-SAT-PASTE-S	☐							
	PSA-S	☐							
	SAT-S	☐							
	TEXTURE-S	☐							
B05111047-040A	CF-S	☐							
	COND-S	☐							
	PH-SAT-PASTE-S	☐							
	PSA-S	☐							
	SAT-S	☐							
	TEXTURE-S	☐							

Bolded analytes are "X" analytes
Wednesday, November 16, 2005

Chain of Custody and Analytical Request Record

Page 1 of 1

PLEASE PRINT, provide as much information as possible. Refer to corresponding notes on reverse side.

Company Name: Golder Associates	Project Name, PWS #, Permit #, Etc.: Tyrone No.1 Test Plots, 053-2377
Report Mail Address: 4910 Alameda Blvd. NE Ste. A Albuquerque, NM 87113	Contact Name, Phone, Fax, E-mail: Lewis Munk (505)821-3043 lmunk@golder.com — Sampler Name if other than Contact:
Invoice Address: 4910 Alameda Blvd. NE Ste. A Albuquerque, NM 87113	Invoice Contact & Phone #: Lewis Munk 505-821-3043 lmunk@golder.com — Purchase Order #: — ELI Quote #:

Report Required For: POTW/WWTP ☐ DW ☐ Other _____

Special Report Formats - ELI must be notified prior to sample submittal for the following:

NELAC ☐ A2LA ☐ Level IV ☐

Other _____

EDD/EDT ☐ Format _____

Notify ELI prior to RUSH sample submittal for additional charges and scheduling

Comments:

Shipped by: UPS AR Ground

Cooler ID(s) —

Receipt Temp 13 °C

Custody Seal Y N

Intact Y N

Signature Y N

Match

Lab ID

	SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	MATRIX (Sample Type: A W S V B O; Air Water Soils/Solids Vegetation Bioassay Other)	Number of Containers	Saturated Paste pH	EC	Saturation %	Sand, silt, clay	rock fragments	SEE ATTACHED	Normal Turnaround (TAT)	RUSH Turnaround (TAT)	LABORATORY USE ONLY
1	No.1 Lys 3-A, 0-2'	5/11/05		soil/solid								X		0511047-001
2	No.1 Lys 3-A, 2-3'	5/11/05										X		-002
3	No.1 8-A Lys Top, 6' bgs	5/4/05										X		-003
4	No.1 8-A Lys Mid, 8' bgs	5/4/05										X		-004
5	No.1 TP-8, 4' bgs	5/4/05										X		-005
6	No.1 TP-8 6' bgs	5/4/05										X		-006
7	No.1 TP-8, 8' bgs	5/4/05										X		-007
8														
9														
10														

Custody Record MUST be Signed

Relinquished by (print): Elizabeth Field	Date/Time: 11/8/05	Signature: Elizabeth Field	Received by (print): — Date/Time: — Signature:
Relinquished by (print): —	Date/Time: —	Signature: —	Received by (print): — Date/Time: 11-15-05 0900 — Signature:

Sample Disposal — Return to client: X — Lab Disposal: —

LABORATORY USE ONLY — Sample Type: — # of fractions —

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested. This serves as notice of this possibility. All sub-contract data will be clearly notated on your analytical report.

Visit our web site at *www.energylab.com* for additional information, downloadable fee schedule, forms, & links.

Chain of Custody and Analytical Request Record

Page 1 of 1

PLEASE PRINT, provide as much information as possible. Refer to corresponding notes on reverse side.

Company Name: Golder Associates

Project Name, PWS #, Permit #, Etc.: Tyrone No.1 Test Plots, 053-2377

Report Mail Address: 4910 Alameda Blvd. NE Ste. A Albuquerque, NM 87113

Contact Name, Phone, Fax, E-mail: Lewis Munk (505)821-3043 lmunk@golder.com

Sampler Name if other than Contact:

Invoice Address: 4910 Alameda Blvd. NE Ste. A Albuquerque, NM 87113

Invoice Contact & Phone #: Lewis Munk 505-821-3043 lmunk@golder.com

Purchase Order #:

ELI Quote #:

Report Required For: POTW/WWTP ☐ DW ☐ Other _____

Special Report Formats - ELI must be notified prior to sample submittal for the following:

NELAC ☐ A2LA ☐ Level IV ☐

Other _____

EDD/EDT ☐ Format _____

Shipped by: UPS AIR Ground

Cooler ID(s)

Receipt Temp 13 °C

Custody Seal Y N

Intact Y N

Signature Y N

Match

Lab ID

Notify ELI prior to RUSH sample submittal for additional charges and scheduling

Comments:

	SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	Number of Containers / Sample Type: A W S V B O / Air Water Soils/Solids Vegetation Bioassay Other / MATRIX	Saturated Paste pH	EC	Saturation %	Sand, silt, clay	rock fragments	SEE ATTACHED	Normal Turnaround (TAT)	RUSH Turnaround (TAT)	LABORATORY USE ONLY
1	No.1 1-B, 0-2'	5/11/05		Soil/Solid	X	X	X	X	X		X		L05111047-008
2	No.1 1-B, 2-3'				X	X	X	X	X		X		-009
3	No.1 1-B, 4-5'				X	X	X	X	X		X		-010
4	No.1 1-C, 0-2'				X	X	X	X	X		X		-011
5	No.1 1-C, 2-3'				X	X	X	X	X		X		-012
6	No.1 1-C, 4-5'				X	X	X	X	X		X		-013
7													
8													
9													
10													

Custody Record MUST be Signed

Relinquished by (print): Elizabeth Field Date/Time: 11/8/05 Signature: Elizabeth Field

Relinquished by (print): Date/Time: Signature:

Received by (print): Date/Time: Signature:

Received by (print): Date/Time: 11-15-05 10:00 Signature:

Sample Disposal: Return to client: X Lab Disposal: _____

LABORATORY USE ONLY

Sample Type: _____ # of fractions _____

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested. This serves as notice of this possibility. All sub-contract data will be clearly notated on your analytical report.

Visit our web site at *www.energylab.com* for additional information, downloadable fee schedule, forms, & links.

ENERGY LABORATORIES

Chain of Custody and Analytical Request Record

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Company Name: Golder Associates

Project Name, PWS #, Permit #, Etc.: Tyrone No.1 Test Plots, 053-2377

Report Mail Address: 4910 Alameda Blvd. NE Ste. A Albuquerque, NM 87113

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Purchase Order #:

ELI Quote #:

Report Required For: POTW/WWTP ☐ DW ☐ Other ______

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NELAC ☐ A2LA ☐ Level IV ☐

Other ______

EDD/EDT ☐ Format ______

Notify ELI prior to RUSH sample submittal for additional charges and scheduling

Comments:

Shipped by: UPS AIRS Card

Cooler ID(s): ~

Receipt Temp: 13 °C

Custody Seal Y (N)

Intact Y (N)

Signature Match Y (N)

ANALYSIS REQUESTED

	SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	MATRIX (Number of Containers; Sample Type: A W S V B O — Air Water Soils/Solids Vegetation Bioassay Other)	Saturated Paste pH	EC	Saturation %	Sand, silt, clay	rock fragments					SEE ATTACHED	Normal Turnaround (TAT)	RUSH Turnaround (TAT)	Comments	Lab ID (LABORATORY USE ONLY)
1	No.1 2-A, (0-2')	5/12/05		soil/solid	↓	↓	↓	↓	↓						X			B05111047-014
2	No.1 2-A, (3-4')	↓		↓	↓	↓	↓	↓	↓						X			-015
3	No.1 3-B, (0-2')	↓		↓	↓	↓	↓	↓	↓						X			-016
4	No.1 3-B, (2-3')	↓		↓	↓	↓	↓	↓	↓						X			-017
5	No.1 3-C, (0-2')	↓		↓	↓	↓	↓	↓	↓						X			-018
6	No.1 3-C, (2-3')	↓		↓	↓	↓	↓	↓	↓						X			-019
7																		
8																		
9																		
10																		

Custody Record MUST be Signed

Relinquished by (print)	Date/Time	Signature	Received by (print)	Date/Time	Signature
Elizabeth Field	11/8/05	Elizabeth Field			
				11-16-05 0900	[signature]

Sample Disposal: Return to client: X Lab Disposal: ______

LABORATORY USE ONLY — Sample Type: ______ # of fractions ______

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested. ***This serves as notice of this possibility. All sub-contract data will be clearly notated on your analytical report.***

Visit our web site at *www.energylab.com* for additional information, downloadable fee schedule, forms, & links.

Chain of Custody and Analytical Request Record

Page 1 of 1

PLEASE PRINT, provide as much information as possible. Refer to corresponding notes on reverse side.

Company Name: Golder Associates

Report Mail Address: 4910 Alameda Blvd. NE Ste. A Albuquerque, NM 87113

Invoice Address: 4910 Alameda Blvd. NE Ste. A Albuquerque, NM 87113

Project Name, PWS #, Permit #, Etc.: Tyrone No.1 Test Plots, 053-2377

Contact Name, Phone, Fax, E-mail: Lewis Munk (505)821-3043 lmunk@golder.com

Sampler Name if other than Contact:

Invoice Contact & Phone #: Lewis Munk 505-821-3043 lmunk@golder.com

Purchase Order #:

ELI Quote #:

Report Required For: POTW/WWTP ☐ DW ☐ Other _____

Special Report Formats - ELI must be notified prior to sample submittal for the following:

NELAC ☐ A2LA ☐ Level IV ☐

Other _____

EDD/EDT ☐ Format _____

Notify ELI prior to RUSH sample submittal for additional charges and scheduling

Comments:

Shipped by: UPS AR SG-H

Cooler ID(s)

Receipt Temp 13 °C

Custody Seal Intact Y N

Signature Match Y N

Lab ID

SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	Number of Containers / Sample Type: A W S V B O / Air Water Soils/Solids Vegetation Bioassay Other / MATRIX	Saturated Paste pH	EC	Saturation %	Sand, silt, clay	rock fragments	SEE ATTACHED	Normal Turnaround (TAT)	RUSH Turnaround (TAT)	LABORATORY USE ONLY
1 No.1 4-A, 0-2'	5/12/05		soil/solid							X		B05111047-020
2 No.1 4-A, 2-3'										X		-021
3 No.1 4-A, 4-5'										X		-022
4 No.1 5-A, 0-2'										X		-023
5 No.1 5-A, 3-4'										X		-024
6 No.1 6-A, 0-2'										X		-025
7 No.1 6-A, 2-3'										X		-026
8												
9												
10												

Custody Record MUST be Signed

Relinquished by (print): Elizabeth Field Date/Time: 11/8/05 Signature: Elizabeth Field

Relinquished by (print): Date/Time: Signature:

Received by (print): Date/Time: Signature:

Received by (print): Date/Time: 11-15-05 10:00 Signature:

Sample Disposal Return to client: X Lab Disposal: _____

LABORATORY USE ONLY

Sample Type: _____ # of fractions _____

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Invoice Contact & Phone #: Lewis Munk 505-821-3043 lmunk@golder.com

Purchase Order #:

ELI Quote #:

Report Required For: POTW/WWTP ☐ DW ☐ Other _____

Special Report Formats - ELI must be notified prior to sample submittal for the following:

NELAC ☐ A2LA ☐ Level IV ☐

Other _____

EDD/EDT ☐ Format _____

Notify ELI prior to RUSH sample submittal for additional charges and scheduling

Shipped by: UPS AR5 Grd

Cooler ID(s) —

Receipt Temp 13 °C

Custody Seal Y N

Intact Y N

Signature Match Y N

Comments:

SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	Number of Containers / Sample Type: A W S V B O / Air Water Soils/Solids Vegetation Bioassay Other / MATRIX	Saturated Paste pH	EC	Saturation %	sand, silt, clay	rock fragments	SEE ATTACHED	Normal Turnaround (TAT)	RUSH Turnaround (TAT)	LABORATORY USE ONLY
1 No.1 7-A, 0-2'	5/12/05		Soil/Solid							X		L5111047-027
2 No.1 7-A, 2-3'	5/12/05									X		-028
3 No.1 7-A, 4-5'	5/12/05									X		-029
4 No.1 8-A, 0-2'	5/5/05									X		-030
5 No.1 8-A, 3-4'	5/5/05									X		-031
6 No.1 9-A, 0-2'	5/12/05									X		-032
7 No.1 9-A, 2-3'	5/12/05									X		-033
8												
9												
10												

Custody Record MUST be Signed

Relinquished by (print): Elizabeth Field Date/Time: 11/8/05 Signature: Elizabeth Field

Relinquished by (print): Date/Time: Signature:

Received by (print): Date/Time: Signature:

Received by (print): Date/Time: 11-16-05 0900 Signature:

Sample Disposal: Return to client: X Lab Disposal _____

LABORATORY USE ONLY

Sample Type: _____ # of fractions _____

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Chain of Custody and Analytical Request Record

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Purchase Order #:

ELI Quote #:

Report Required For: POTW/WWTP ☐ DW ☐ Other _____

Special Report Formats - ELI must be notified prior to sample submittal for the following:

NELAC ☐ A2LA ☐ Level IV ☐

Other _____

EDD/EDT ☐ Format _____

Number of Containers / Sample Type: A W S V B O / Air Water Soils/Solids Vegetation Bioassay Other

ANALYSIS REQUESTED

SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	MATRIX	Saturated Paste pH	EC	Saturation %	sand, silt, clay	rock fragments	SEE ATTACHED	Normal Turnaround (TAT)	RUSH Turnaround (TAT)	LABORATORY USE ONLY
1 No.1 10-A, 0-2'			Soil/solid							X		0511047-034
2 No.1 10-A, 3-4'										X		-035
3 No.1 10-A, 4-5'										X		-036
4 No.1 10-A, 6-7'										X		-037
5 No.1 Lys 1-A, 0-2'	5/10/05									X		-038
6 No.1 Lys 1-A, 2-3'	5/10/05									X		-039
7 No.1 Lys 1-A, 4-5'	5/10/05									X		-040
8												
9												
10												

Notify ELI prior to RUSH sample submittal for additional charges and scheduling

Comments:

Shipped by: UPS AIRGnd

Cooler ID(s)

Receipt Temp 13 °C

Custody Seal Y N

Intact Y N

Signature Y N

Match

Lab ID

Custody Record MUST be Signed

Relinquished by (print): Elizabeth Field Date/Time: 11/8/05 Signature: Elizabeth Field

Relinquished by (print): Date/Time: Signature:

Received by (print): Date/Time: Signature:

Received by (print): Date/Time: 11-16-05/0900 Signature:

Sample Disposal: Return to client: X Lab Disposal: _____

LABORATORY USE ONLY

Sample Type: _____ # of fractions _____

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APPENDIX C

SOIL HYDRAULIC LABORATORY DATA
COVER MATERIALS

Laboratory Report for

Golder Associates, Inc.

Project #053-2377

September 18, 2006

Daniel B. Stephens & Associates, Inc.

6020 Academy NE, Suite 100 • Albuquerque, New Mexico 87109

September 18, 2006

Mr. Lewis Munk
Golder Associates, Inc.
5200 Pasadena Ave NE, Suite C
Albuquerque, NM 87113

Re: DBS&A Laboratory Report for Golder Associates, Inc.
Project # 053-2377

Dear Mr. Munk:

Enclosed is the final report for the Golder Associates, Inc. (Project # 053-2377). Please review this report and provide any comments as samples will be held for a maximum of 30 days. After 30 days samples will be returned or disposed of in an appropriate manner.

All testing results were evaluated subjectively for consistency and reasonableness, and the results appear to be reasonably representative of the material tested. However, DBS&A does not assume any responsibility for interpretations or analyses based on the data enclosed, nor can we guarantee that these data are fully representative of the undisturbed materials at the field site. We recommend that careful evaluation of these laboratory results be made for your particular application.

The testing utilized to generate the enclosed final report employs methods that are standard for the industry. The results do not constitute a professional opinion by DBS&A, nor can the results affect any professional or expert opinions rendered with respect thereto by DBS&A. You have acknowledged that all the testing undertaken by us, and the final report provided, constitutes mere test results using standardized methods, and cannot be used to disqualify DBS&A from rendering any professional or expert opinion, having waived any claim of conflict of interest by DBS&A.

We are pleased to provide this service to Golder Associates, Inc. and look forward to future laboratory testing on other projects. If you have any questions about the enclosed data, please do not hesitate to call.

Sincerely,

DANIEL B. STEPHENS & ASSOCIATES, INC.
LABORATORY / TESTING FACILITY

Joleen Hines
Laboratory Supervising Manager

Enclosure

Daniel B. Stephens & Associates, Inc.
6020 Academy NE, Suite 100 505-822-9400

Summaries

Summary of Tests Performed

Laboratory Sample Number	Initial Soil Properties[1] (θ, ρ_d, ϕ)	Saturated Hydraulic Conductivity[2]		Moisture Characteristics[3]					Unsaturated Hydraulic Conductivity	Particle Size[4]			Effective Porosity	Particle Density	Air Permeability	1/3, 15 Bar Points and Water Holding Capacity	Atterberg Limits	Proctor Compaction
		CH	FH	HC	PP	TH	WP	RH		DS	WS	H						
No1-1-1	X	X		X	X		X	X	X					X				
No1-1-2	X	X		X	X		X	X	X					X				
No1-2-1	X	X		X	X		X	X	X					X				
No1-2-2	X	X		X	X		X	X	X					X				
No1-3-1	X	X		X	X		X	X	X					X				
No1-3-2	X	X		X	X		X	X	X					X				
No1-8-LY	X	X		X	X		X	X	X					X				

[1] θ = Initial moisture content, ρ_d = Dry bulk density, ϕ = Calculated porosity

[2] CH = Constant head, FH = falling head

[3] HC = Hanging column, PP = Pressure plate, TH = Thermocouple psychrometer, WP = Water activity meter, RH = Relative humidity box

[4] DS = Dry sieve, WS = Wet sieve, H = Hydrometer

Summary of Sample Preparation

	Target Remold Values*		Actual Remold Data			*Final* Measured Changed Densities**		
Sample Number	Target Remold Moisture Content (g/cm^3)	Target Remold Densities (g/cm^3)	Moisture Content (%, g/g)	Dry Bulk Density (g/cm^3)	% of Target Density (%)	Final Measured Dry Bulk Density (g/cm^3)	Final % Volume Change (%)	Final % of Target Density (%)
No1-1-1	15.0	1.4	16.5	1.39	99.2%	1.66	(-) 16.5	118.6%
No1-1-2	15.0	1.4	15.2	1.40	100.1%	1.51	(-) 7.3	107.9%
No1-2-1	15.0	1.4	16.7	1.39	99.6%	1.64	(-) 14.8	117.1%
No1-2-2	15.0	1.4	15.2	1.41	101.1%	1.52	(-) 7.1	108.6%
No1-3-1	15.0	1.4	16.3	1.39	99.3%	1.71	(-) 18.6	122.1%
No1-3-2	15.0	1.4	15.8	1.39	99.1%	1.70	(-) 18.5	121.4%
No1-8-LY	15.0	1.4	15.8	1.41	100.5%	1.68	(-) 16.2	120.0%

*Target remold values provided by the client.

**Final Measured Changed Densities: Volume change measurements were obtained after saturated hydraulic conductivity testing and throughout unsaturated hydraulic conductivity testing. The reported values are the final sample dimensions.

Note: (+) denotes observed sample swelling, and (-) denotes observed sample settling.

NA = Not Applicable

Summary of Initial Moisture Content, Dry Bulk Density Wet Bulk Density and Calculated Porosity

Sample Number	Moisture Content				Dry Bulk Density (g/cm^3)	Wet Bulk Density (g/cm^3)	Calculated Porosity (%)
	As Received		Remolded				
	Gravimetric (%, g/g)	Volumetric (%, cm^3/cm^3)	Gravimetric (%, g/g)	Volumetric (%, cm^3/cm^3)			
No1-1-1	NA	NA	16.5	22.9	1.39	1.62	47.3
No1-1-2	NA	NA	15.2	21.3	1.40	1.62	47.1
No1-2-1	NA	NA	16.7	23.3	1.39	1.63	46.7
No1-2-2	NA	NA	15.2	21.4	1.41	1.63	45.7
No1-3-1	NA	NA	16.3	22.7	1.39	1.62	47.4
No1-3-2	NA	NA	15.8	21.9	1.39	1.61	47.0
No1-8-LY	NA	NA	15.8	22.2	1.41	1.63	45.6

NA = Not analyzed

--- = This sample was not remolded

Summary of Saturated Hydraulic Conductivity Tests

Sample Number	K_{sat} (cm/sec)	Oversize Corrected K_{sat} (cm/sec)	Method of Analysis	
			Constant Head	Falling Head
No1-1-1	1.3E-02	3.3E-03	X	
No1-1-2	3.5E-02	1.4E-02	X	
No1-2-1	5.0E-03	1.7E-03	X	
No1-2-2	1.6E-02	5.4E-03	X	
No1-3-1	1.9E-02	7.3E-03	X	
No1-3-2	2.6E-02	1.1E-02	X	
No1-8-LY	1.1E-02	3.8E-03	X	

Summary of Moisture Characteristics of the Initial Drainage Curve

Sample Number	Pressure Head (-cm water)	Moisture Content (%, cm^3/cm^3)
No1-1-1	0	39.3
	5	35.5
	10	33.9
	77	25.9
	510	19.1
	6935	8.8
	851293	1.8
No1-1-2	0	44.0
	5	42.4
	10	36.2
	77	25.5
	510	19.9
	12849	8.8
	851293	2.2
No1-2-1	0	41.0
	5	37.1
	10	35.5
	77	26.7
	510	19.6
	12136	8.3
	851293	2.3
No1-2-2	0	42.6
	5	40.7
	10	35.0
	77	24.5
	510	19.3
	11728	8.2
	851293	2.2

Summary of Moisture Characteristics of the Initial Drainage Curve (Continued)

Sample Number	Pressure Head (-cm water)	Moisture Content (%, cm^3/cm^3)
No1-3-1	0	38.4
	5	34.4
	10	33.0
	77	28.8
	510	23.2
	13461	7.8
	851293	1.6
No1-3-2	0	34.2
	5	30.7
	10	29.3
	77	25.2
	510	19.0
	6935	8.3
	851293	2.0
No1-8-LY	0	40.4
	5	35.8
	10	34.4
	77	26.5
	510	19.3
	11218	8.3
	851293	2.4

Summary of Calculated Unsaturated Hydraulic Properties

Sample Number	α (cm^{-1})	N (dimensionless)	θ_r (% vol)	θ_s (% vol)	Oversize Corrected θ_r (% vol)	Oversize Corrected θ_s (% vol)
No1-1-1	0.0632	1.2258	0.00	37.94	0.00	14.53
No1-1-2	0.1454	1.2114	0.00	44.45	0.00	24.54
No1-2-1	0.0775	1.2169	0.00	39.93	0.00	19.92
No1-2-2	0.1465	1.2127	0.00	42.94	0.00	20.86
No1-3-1	0.0119	1.2783	0.00	35.31	0.00	19.41
No1-3-2	0.0213	1.2513	0.00	31.88	0.00	18.61
No1-8-LY	0.0795	1.2128	0.00	39.00	0.00	19.57

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass

NA = Not analyzed

Summary of Particle Density Tests

Sample Number	Particle Density (g/cm^3)
No1-1-1	2.64
No1-1-2	2.65
No1-2-1	2.62
No1-2-2	2.60
No1-3-1	2.64
No1-3-2	2.62
No1-8-LY	2.59

Laboratory Data and Graphical Plots

Initial Properties

Summary of Initial Moisture Content, Dry Bulk Density Wet Bulk Density and Calculated Porosity

Sample Number	Moisture Content				Dry Bulk Density (g/cm^3)	Wet Bulk Density (g/cm^3)	Calculated Porosity (%)
	As Received		Remolded				
	Gravimetric (%, g/g)	Volumetric (%, cm^3/cm^3)	Gravimetric (%, g/g)	Volumetric (%, cm^3/cm^3)			
No1-1-1	NA	NA	16.5	22.9	1.39	1.62	47.3
No1-1-2	NA	NA	15.2	21.3	1.40	1.62	47.1
No1-2-1	NA	NA	16.7	23.3	1.39	1.63	46.7
No1-2-2	NA	NA	15.2	21.4	1.41	1.63	45.7
No1-3-1	NA	NA	16.3	22.7	1.39	1.62	47.4
No1-3-2	NA	NA	15.8	21.9	1.39	1.61	47.0
No1-8-LY	NA	NA	15.8	22.2	1.41	1.63	45.6

NA = Not analyzed

--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Golder Associates, Inc.
Job Number: LB06.0155.00
Sample Number: No1-1-1
Ring Number: NA
Depth: NA

	As Received	Remolded
Test Date:	NA	31-Jul-06
Field weight of sample* (g):		308.85
Tare weight, ring (g):		66.46
Tare weight, pan/plate (g):		0.00
Tare weight, other (g):		0.00
Dry weight of sample (g):		208.11
Sample volume (cm^3):		149.83
Measured particle density (g/cm^3):		2.64
Gravimetric Moisture Content (% g/g):		16.5
Volumetric Moisture Content (% vol):		22.9
Dry bulk density (g/cm^3):		1.39
Wet bulk density (g/cm^3):		1.62
Calculated Porosity (% vol):		47.3
Percent Saturation:		48.4

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Golder Associates, Inc.
Job Number: LB06.0155.00
Sample Number: No1-1-2
Ring Number: NA
Depth: NA

	As Received	Remolded
Test Date:	NA	31-Jul-06
Field weight of sample* (g):		333.30
Tare weight, ring (g):		84.73
Tare weight, pan/plate (g):		0.00
Tare weight, other (g):		0.00
Dry weight of sample (g):		215.74
Sample volume (cm^3):		153.88
Measured particle density (g/cm^3):		2.65
Gravimetric Moisture Content (% g/g):		15.2
Volumetric Moisture Content (% vol):		21.3
Dry bulk density (g/cm^3):		1.40
Wet bulk density (g/cm^3):		1.62
Calculated Porosity (% vol):		47.1
Percent Saturation:		45.3

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Golder Associates, Inc.
Job Number: LB06.0155.00
Sample Number: No1-2-1
Ring Number: NA
Depth: NA

	As Received	Remolded
Test Date:	NA	31-Jul-06
Field weight of sample* (g):		343.00
Tare weight, ring (g):		73.87
Tare weight, pan/plate (g):		0.00
Tare weight, other (g):		0.00
Dry weight of sample (g):		230.67
Sample volume (cm^3):		165.39
Measured particle density (g/cm^3):		2.62
Gravimetric Moisture Content (% g/g):		16.7
Volumetric Moisture Content (% vol):		23.3
Dry bulk density (g/cm^3):		1.39
Wet bulk density (g/cm^3):		1.63
Calculated Porosity (% vol):		46.7
Percent Saturation:		49.8

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Golder Associates, Inc.
Job Number: LB06.0155.00
Sample Number: No1-2-2
Ring Number: NA
Depth: NA

	As Received	Remolded
Test Date:	NA	31-Jul-06
Field weight of sample* (g):		299.01
Tare weight, ring (g):		64.74
Tare weight, pan/plate (g):		0.00
Tare weight, other (g):		0.00
Dry weight of sample (g):		203.43
Sample volume (cm^3):		143.78
Measured particle density (g/cm^3):		2.60
Gravimetric Moisture Content (% g/g):		15.2
Volumetric Moisture Content (% vol):		21.4
Dry bulk density (g/cm^3):		1.41
Wet bulk density (g/cm^3):		1.63
Calculated Porosity (% vol):		45.7
Percent Saturation:		47.0

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Golder Associates, Inc.
Job Number: LB06.0155.00
Sample Number: No1-3-1
Ring Number: NA
Depth: NA

	As Received	Remolded
Test Date:	NA	31-Jul-06
Field weight of sample* (g):		346.05
Tare weight, ring (g):		92.02
Tare weight, pan/plate (g):		0.00
Tare weight, other (g):		0.00
Dry weight of sample (g):		218.40
Sample volume (cm^3):		157.16
Measured particle density (g/cm^3):		2.64
Gravimetric Moisture Content (% g/g):		16.3
Volumetric Moisture Content (% vol):		22.7
Dry bulk density (g/cm^3):		1.39
Wet bulk density (g/cm^3):		1.62
Calculated Porosity (% vol):		47.4
Percent Saturation:		47.8

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Golder Associates, Inc.
Job Number: LB06.0155.00
Sample Number: No1-3-2
Ring Number: NA
Depth: NA

	As Received	Remolded
Test Date:	NA	31-Jul-06
Field weight of sample* (g):		308.93
Tare weight, ring (g):		66.91
Tare weight, pan/plate (g):		0.00
Tare weight, other (g):		0.00
Dry weight of sample (g):		209.06
Sample volume (cm^3):		150.67
Measured particle density (g/cm^3):		2.62
Gravimetric Moisture Content (% g/g):		15.8
Volumetric Moisture Content (% vol):		21.9
Dry bulk density (g/cm^3):		1.39
Wet bulk density (g/cm^3):		1.61
Calculated Porosity (% vol):		47.0
Percent Saturation:		46.5

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Daniel B. Stephens & Associates, Inc.

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Golder Associates, Inc.
Job Number: LB06.0155.00
Sample Number: No1-8-LY
Ring Number: NA
Depth: NA

	As Received	Remolded
Test Date:	NA	31-Jul-06
Field weight of sample* (g):		298.56
Tare weight, ring (g):		76.99
Tare weight, pan/plate (g):		0.00
Tare weight, other (g):		0.00
Dry weight of sample (g):		191.33
Sample volume (cm^3):		135.93
Measured particle density (g/cm^3):		2.59
Gravimetric Moisture Content (% g/g):		15.8
Volumetric Moisture Content (% vol):		22.2
Dry bulk density (g/cm^3):		1.41
Wet bulk density (g/cm^3):		1.63
Calculated Porosity (% vol):		45.6
Percent Saturation:		48.7

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Saturated Hydraulic Conductivity

Summary of Saturated Hydraulic Conductivity Tests

Sample Number	K_{sat} (cm/sec)	Oversize Corrected K_{sat} (cm/sec)	Method of Analysis	
			Constant Head	Falling Head
No1-1-1	1.3E-02	3.3E-03	X	
No1-1-2	3.5E-02	1.4E-02	X	
No1-2-1	5.0E-03	1.7E-03	X	
No1-2-2	1.6E-02	5.4E-03	X	
No1-3-1	1.9E-02	7.3E-03	X	
No1-3-2	2.6E-02	1.1E-02	X	
No1-8-LY	1.1E-02	3.8E-03	X	

Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Constant Head Method

Job name:	Golder Associates, Inc.	*Type of water used:*	TAP
Job number:	LB06.0155.00	*Collection vessel tare* (g):	4.70
Sample number:	No1-1-1	*Sample length* (cm):	5.01
Ring Number:	NA	*Sample diameter* (cm):	6.17
Depth:	NA	*Sample x-sectional area* (cm^2):	29.92

Date	Time	Temp (°C)	Head (cm)	Q + Tare (g)	Q (cm^3)	Elapsed time (sec)	Ksat (cm/sec)	Ksat @ 20°C (cm/sec)
Test # 1:								
03-Aug-06	14:16:12	21.0	0.9	10.4	5.7	69	1.5E-02	1.5E-02
03-Aug-06	14:17:21							
Test # 2:								
08-Aug-06	10:38:35	22.5	0.8	12.5	7.8	118	1.4E-02	1.3E-02
08-Aug-06	10:40:33							
Test # 3:								
08-Aug-06	14:10:43	21.5	1.0	28.1	23.4	323	1.2E-02	1.2E-02
08-Aug-06	14:16:06							

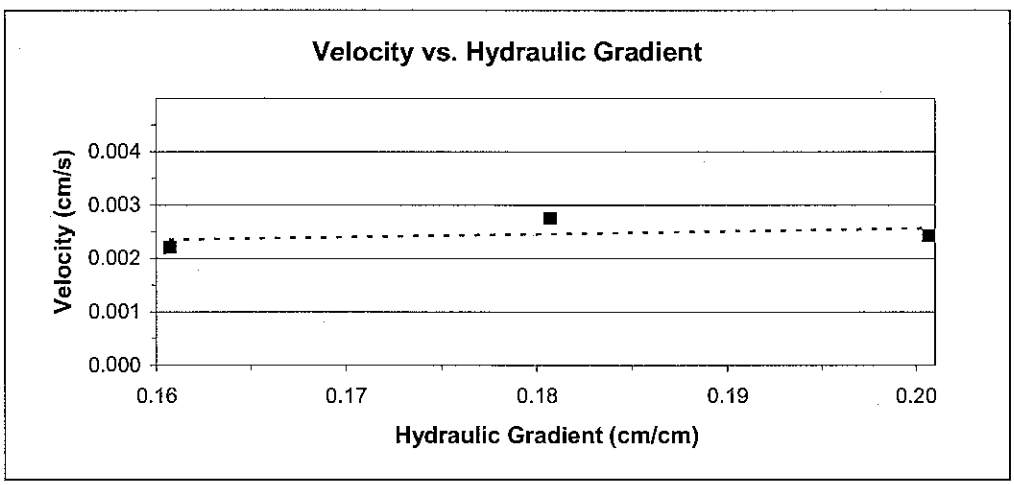
***Average Ksat* (cm/sec):** **1.3E-02**

***Oversize Corrected Ksat* (cm/sec):** **3.3E-03**

Comments:

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass

NA = Not analyzed



Laboratory analysis by: D. O'Dowd

Data entered by: D. O'Dowd

Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Constant Head Method

Job name:	Golder Associates, Inc.	*Type of water used:*	TAP
Job number:	LB06.0155.00	*Collection vessel tare* (g):	6.37
Sample number:	No1-1-2	*Sample length* (cm):	5.18
Ring Number:	NA	*Sample diameter* (cm):	6.15
Depth:	NA	*Sample x-sectional area* (cm^2):	29.70

Date	Time	Temp (°C)	Head (cm)	Q + Tare (g)	Q (cm^3)	Elapsed time (sec)	Ksat (cm/sec)	Ksat @ 20°C (cm/sec)
Test # 1:								
03-Aug-06	13:27:45	21.0	0.5	14.8	8.4	89	3.3E-02	3.2E-02
03-Aug-06	13:29:14							
Test # 2:								
08-Aug-06	13:50:59	21.5	0.6	18.4	12.0	97	3.6E-02	3.5E-02
08-Aug-06	13:52:36							
Test # 3:								
08-Aug-06	14:09:52	21.5	0.8	17.3	10.9	59	4.0E-02	3.9E-02
08-Aug-06	14:10:51							

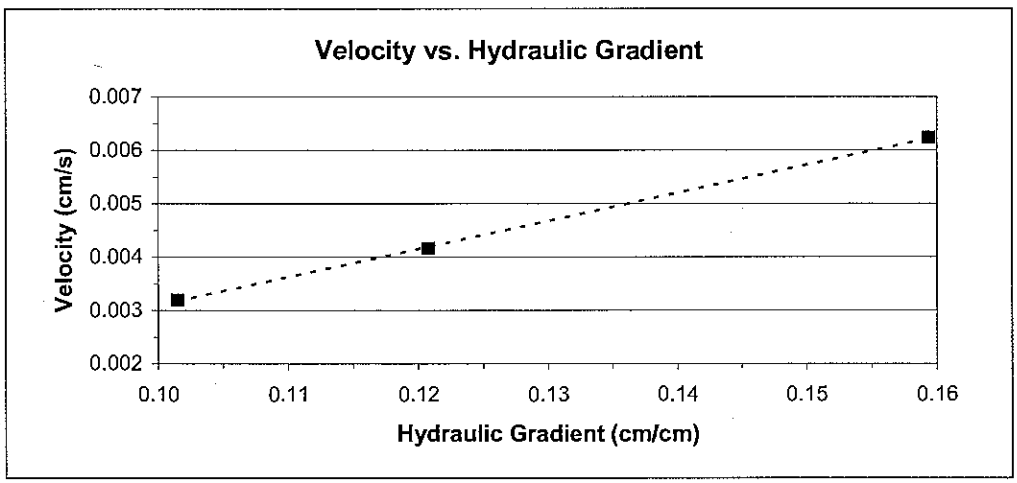
***Average Ksat* (cm/sec):** **3.5E-02**

***Oversize Corrected Ksat* (cm/sec):** **1.4E-02**

Comments:

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass

NA = Not analyzed



Laboratory analysis by: D. O'Dowd

Data entered by: D. O'Dowd

Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Constant Head Method

Job name: Golder Associates, Inc.
Job number: LB06.0155.00
Sample number: No1-2-1
Ring Number: NA
Depth: NA

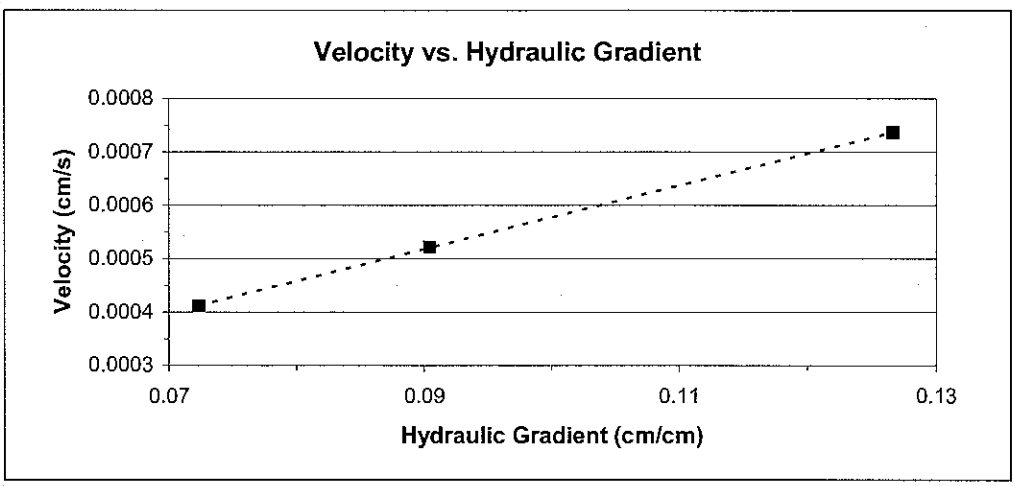
Type of water used: TAP
Collection vessel tare (g): 10.83
Sample length (cm): 5.53
Sample diameter (cm): 6.17
Sample x-sectional area (cm^2): 29.92

Date	Time	Temp (°C)	Head (cm)	Q + Tare (g)	Q (cm^3)	Elapsed time (sec)	Ksat (cm/sec)	Ksat @ 20°C (cm/sec)
Test # 1:								
03-Aug-06	11:43:39	21.0	0.5	17.1	6.3	447	5.2E-03	5.1E-03
03-Aug-06	11:51:06							
Test # 2:								
03-Aug-06	12:52:43	21.0	0.7	13.9	3.0	147	5.4E-03	5.3E-03
03-Aug-06	12:55:10							
Test # 3:								
08-Aug-06	10:51:06	22.5	0.4	12.8	2.0	185	5.0E-03	4.7E-03
08-Aug-06	10:54:11							

***Average Ksat* (cm/sec):** **5.0E-03**
***Oversize Corrected Ksat* (cm/sec):** **1.7E-03**

Comments:

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
NA = Not analyzed



Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Saturated Hydraulic Conductivity
Constant Head Method

Job name: Golder Associates, Inc.
Job number: LB06.0155.00
Sample number: No1-2-2
Ring Number: NA
Depth: NA

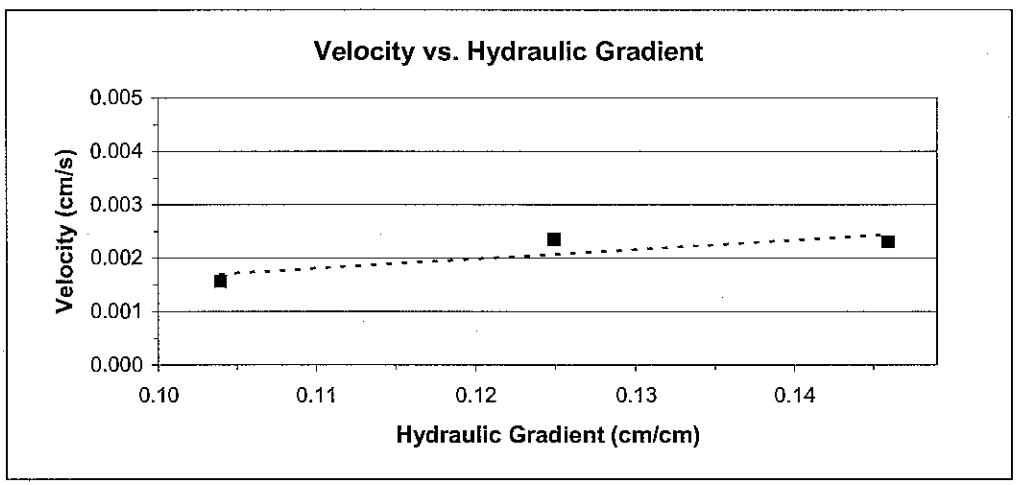
Type of water used: TAP
Collection vessel tare (g): 11.52
Sample length (cm): 4.76
Sample diameter (cm): 6.20
Sample x-sectional area (cm^2): 30.18

Date	Time	Temp (°C)	Head (cm)	Q + Tare (g)	Q (cm^3)	Elapsed time (sec)	Ksat (cm/sec)	Ksat @ 20°C (cm/sec)
Test # 1:								
03-Aug-06	13:27:24	21.0	0.6	24.4	12.8	181	1.9E-02	1.8E-02
03-Aug-06	13:30:25							
Test # 2:								
08-Aug-06	13:50:43	21.5	0.5	16.0	4.5	95	1.5E-02	1.4E-02
08-Aug-06	13:52:18							
Test # 3:								
08-Aug-06	14:09:41	21.5	0.7	23.3	11.8	169	1.6E-02	1.5E-02
08-Aug-06	14:12:30							

***Average Ksat* (cm/sec):** **1.6E-02**
***Oversize Corrected Ksat* (cm/sec):** **5.4E-03**

Comments:

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
NA = Not analyzed



Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Saturated Hydraulic Conductivity
Constant Head Method

Job name: Golder Associates, Inc.
Job number: LB06.0155.00
Sample number: No1-3-1
Ring Number: NA
Depth: NA

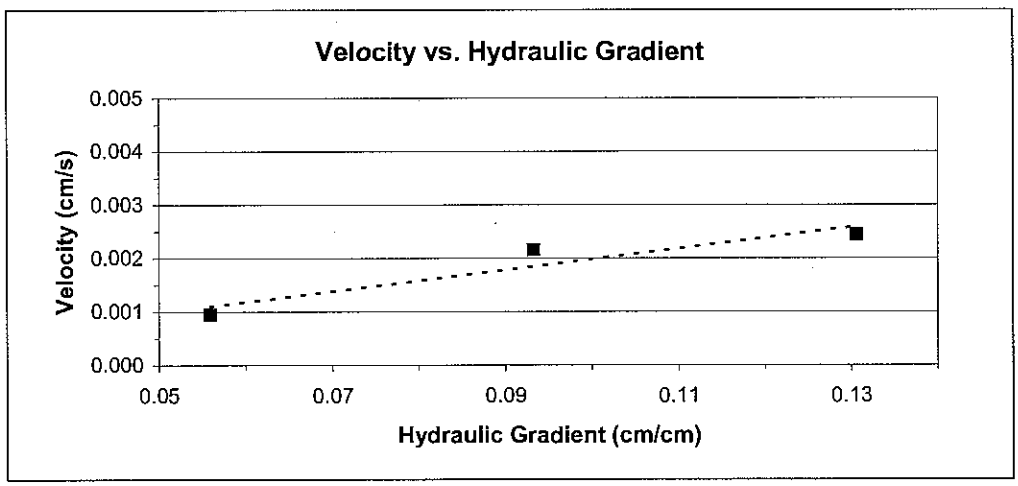
Type of water used: TAP
Collection vessel tare (g)*:* 4.62
Sample length (cm)*:* 5.36
Sample diameter (cm)*:* 6.11
Sample x-sectional area (cm^2)*:* 29.32

Date	Time	Temp (°C)	Head (cm)	Q + Tare (g)	Q (cm^3)	Elapsed time (sec)	Ksat (cm/sec)	Ksat @ 20°C (cm/sec)
Test # 1:								
03-Aug-06	11:41:21	21.0	0.3	18.9	14.2	514	1.7E-02	1.6E-02
03-Aug-06	11:49:55							
Test # 2:								
08-Aug-06	10:06:26	22.5	0.7	18.5	13.9	194	1.9E-02	1.8E-02
08-Aug-06	10:09:40							
Test # 3:								
08-Aug-06	10:25:59	22.5	0.5	17.5	12.8	203	2.3E-02	2.2E-02
08-Aug-06	10:29:22							

Average Ksat* (cm/sec)*: **1.9E-02**
Oversize Corrected Ksat* (cm/sec)*: **7.3E-03**

Comments:

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
NA = Not analyzed



Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Constant Head Method

Job name: Golder Associates, Inc.
Job number: LB06.0155.00
Sample number: No1-3-2
Ring Number: NA
Depth: NA

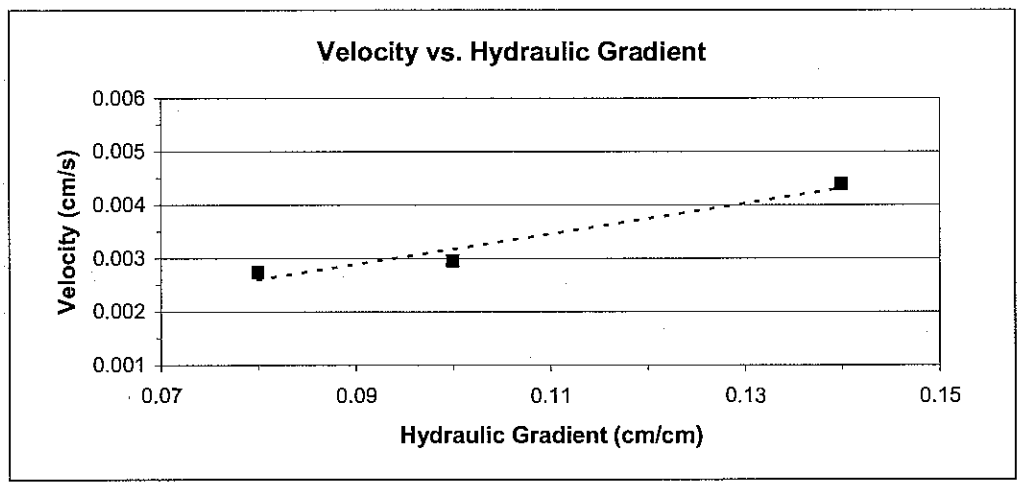
Type of water used: TAP
Collection vessel tare (g): 6.43
Sample length (cm): 5.00
Sample diameter (cm): 6.19
Sample x-sectional area (cm^2): 30.12

Date	Time	Temp (°C)	Head (cm)	Q + Tare (g)	Q (cm^3)	Elapsed time (sec)	Ksat (cm/sec)	Ksat @ 20°C (cm/sec)
Test # 1:								
03-Aug-06	11:41:35	21.0	0.5	41.5	35.1	475	2.5E-02	2.4E-02
03-Aug-06	11:49:30							
Test # 2:								
03-Aug-06	12:46:43	21.0	0.7	22.6	16.2	138	2.8E-02	2.7E-02
03-Aug-06	12:49:01							
Test # 3:								
08-Aug-06	10:18:18	22.5	0.4	25.6	19.2	284	2.8E-02	2.7E-02
08-Aug-06	10:23:02							

***Average Ksat* (cm/sec):** **2.6E-02**
***Oversize Corrected Ksat* (cm/sec):** **1.1E-02**

Comments:

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
NA = Not analyzed



Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Constant Head Method

Job name: Golder Associates, Inc.
Job number: LB06.0155.00
Sample number: No1-8-LY
Ring Number: NA
Depth: NA

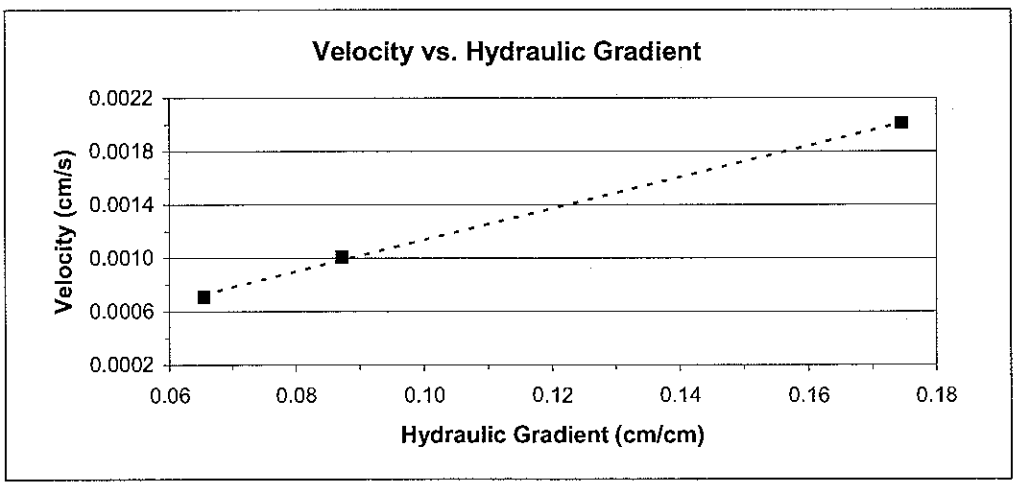
Type of water used: TAP
Collection vessel tare (g): 6.64
Sample length (cm): 4.58
Sample diameter (cm): 6.15
Sample x-sectional area (cm^2): 29.67

Date	Time	Temp (°C)	Head (cm)	Q + Tare (g)	Q (cm^3)	Elapsed time (sec)	Ksat (cm/sec)	Ksat @ 20°C (cm/sec)
Test # 1:								
03-Aug-06	09:42:54	21.0	0.8	19.5	12.8	215	1.2E-02	1.1E-02
03-Aug-06	09:46:29							
Test # 2:								
08-Aug-06	10:38:16	22.5	0.4	9.7	3.0	101	1.2E-02	1.1E-02
08-Aug-06	10:39:57							
Test # 3:								
08-Aug-06	10:50:47	22.5	0.3	8.6	2.0	95	1.1E-02	1.0E-02
08-Aug-06	10:52:22							

***Average Ksat* (cm/sec):** **1.1E-02**
***Oversize Corrected Ksat* (cm/sec):** **3.8E-03**

Comments:

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
NA = Not analyzed



Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Moisture Retention Characteristics

Summary of Moisture Characteristics of the Initial Drainage Curve

Sample Number	Pressure Head (-cm water)	Moisture Content (%, cm^3/cm^3)
No1-1-1	0	39.3
	5	35.5
	10	33.9
	77	25.9
	510	19.1
	6935	8.8
	851293	1.8
No1-1-2	0	44.0
	5	42.4
	10	36.2
	77	25.5
	510	19.9
	12849	8.8
	851293	2.2
No1-2-1	0	41.0
	5	37.1
	10	35.5
	77	26.7
	510	19.6
	12136	8.3
	851293	2.3
No1-2-2	0	42.6
	5	40.7
	10	35.0
	77	24.5
	510	19.3
	11728	8.2
	851293	2.2

Summary of Moisture Characteristics of the Initial Drainage Curve (Continued)

Sample Number	Pressure Head (-cm water)	Moisture Content (%, cm^3/cm^3)
No1-3-1	0	38.4
	5	34.4
	10	33.0
	77	28.8
	510	23.2
	13461	7.8
	851293	1.6
No1-3-2	0	34.2
	5	30.7
	10	29.3
	77	25.2
	510	19.0
	6935	8.3
	851293	2.0
No1-8-LY	0	40.4
	5	35.8
	10	34.4
	77	26.5
	510	19.3
	11218	8.3
	851293	2.4

Summary of Calculated Unsaturated Hydraulic Properties

Sample Number	α (cm^{-1})	N (dimensionless)	θ_r (% vol)	θ_s (% vol)	Oversize Corrected θ_r (% vol)	Oversize Corrected θ_s (% vol)
No1-1-1	0.0632	1.2258	0.00	37.94	0.00	14.53
No1-1-2	0.1454	1.2114	0.00	44.45	0.00	24.54
No1-2-1	0.0775	1.2169	0.00	39.93	0.00	19.92
No1-2-2	0.1465	1.2127	0.00	42.94	0.00	20.86
No1-3-1	0.0119	1.2783	0.00	35.31	0.00	19.41
No1-3-2	0.0213	1.2513	0.00	31.88	0.00	18.61
No1-8-LY	0.0795	1.2128	0.00	39.00	0.00	19.57

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass

NA = Not analyzed

Moisture Retention Data

Hanging Column/Pressure Plate/Thermocouple

(Main Drainage Curve)

Job Name: Golder Associates, Inc.
Job Number: LB06.0155.00
Sample Number: No1-1-1
Ring Number: NA
Depth: NA

Dry wt. of sample (g): 208.11
Tare wt., ring (g): 66.46
Tare wt., screen & clamp (g): 26.25
Sample volume (cm^3): 149.83

Saturated weight at 0 cm tension* (g): 359.63
Volume of water[T] in saturated sample (cm^3): 58.81
Saturated moisture content (% vol): 39.25
Sample bulk density (g/cm^3): 1.39

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content[T] (% vol)
Hanging column:	10-Aug-06 / 10:15	359.63	0.00	39.25
	16-Aug-06 / 07:44	353.98	5.00	35.48
	23-Aug-06 / 10:41	351.65	9.50	33.92
	29-Aug-06 / 16:05	339.65	76.50	25.92
Pressure plate:	07-Sep-06 / 09:53	329.47	509.90	19.12

Comments:

* Weight including tares
[T] Assumed density of water is 1.0 g/cm^3

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines

Moisture Retention Data

Water Activity Meter/Relative Humidity Box

(Main Drainage Curve)

Job Name: Golder Associates, Inc.
Job Number: LB06.0155.00
Sample Number: No1-1-1
Ring Number: NA
Depth: NA

Dry weight of water activity meter sample* (g): 153.45
Tare weight, jar (g): 112.78
Sample bulk density (g/cm^3): 1.39

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content^T (% vol)
Water Activity Meter:	14-Aug-06 / 16:05	156.02	6934.6	8.78

Dry weight of relative humidity box sample* (g): 86.29
Tare weight (g): 44.10
Sample bulk density (g/cm^3): 1.39

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content^T (% vol)
Relative humidity box:	14-Aug-06 / 14:00	86.83	851293	1.78

Comments:

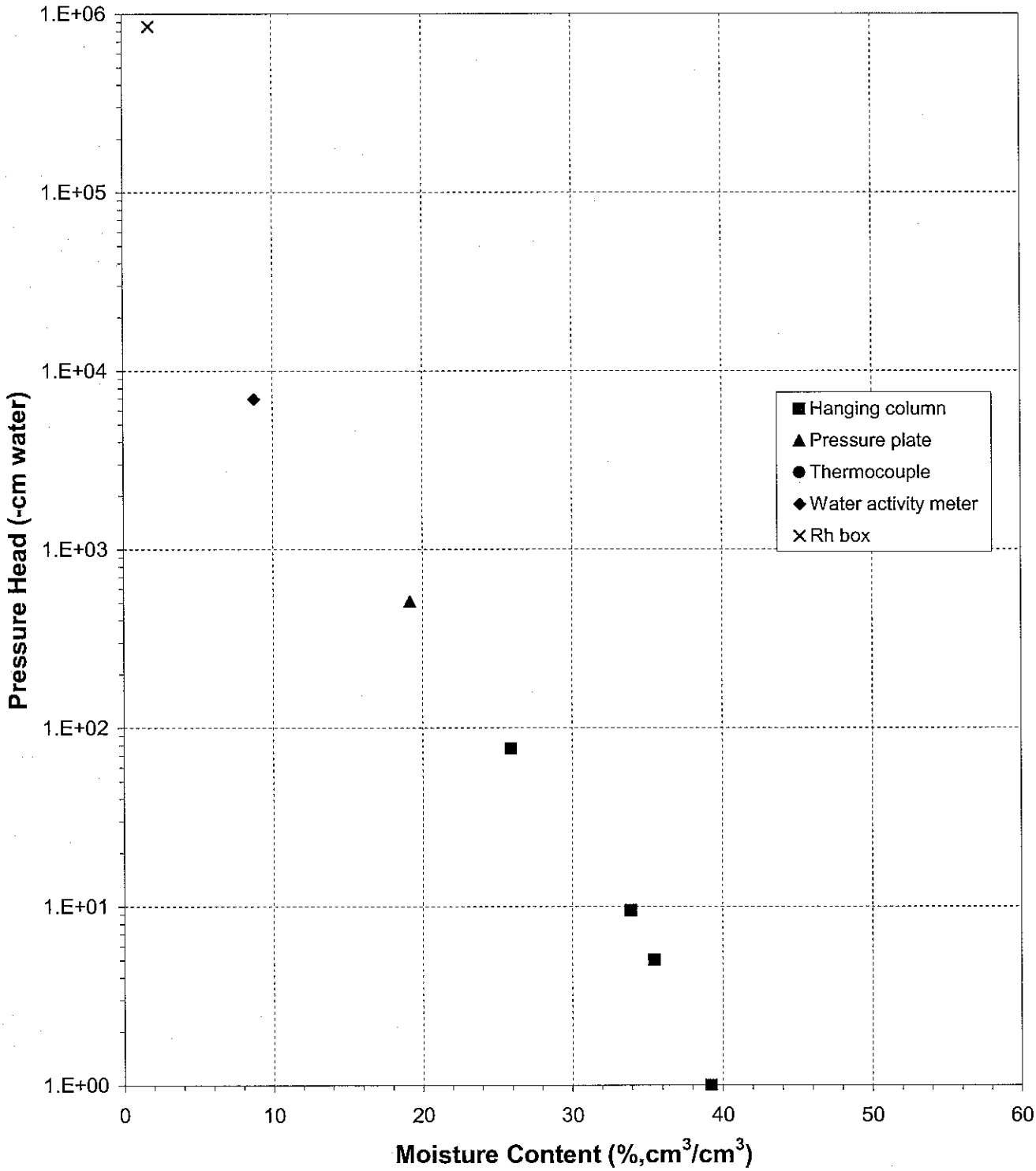
* Weight including tares

† Assumed density of water is 1.0 g/cm^3

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines

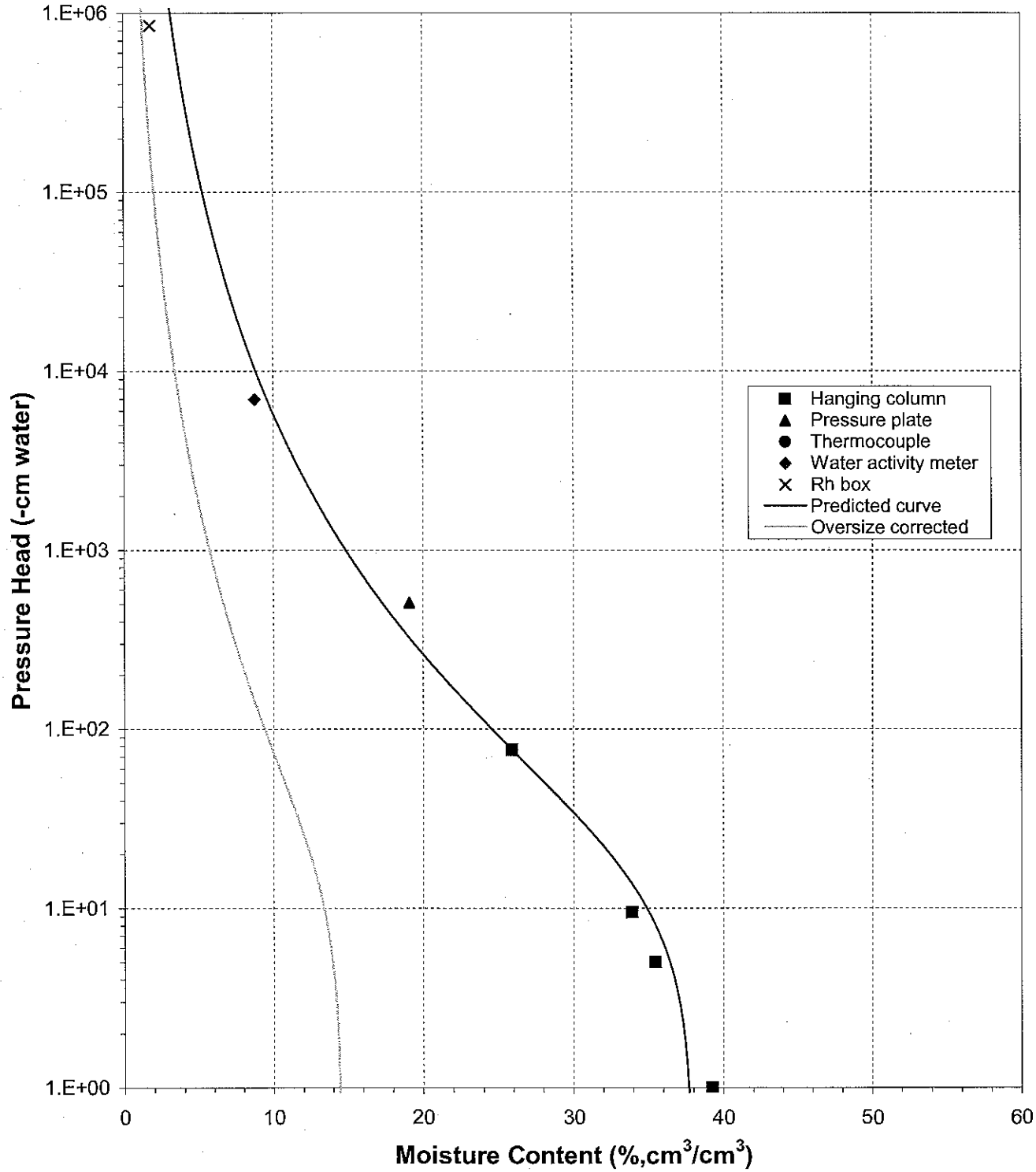
Water Retention Data Points

Sample Number: No1-1-1



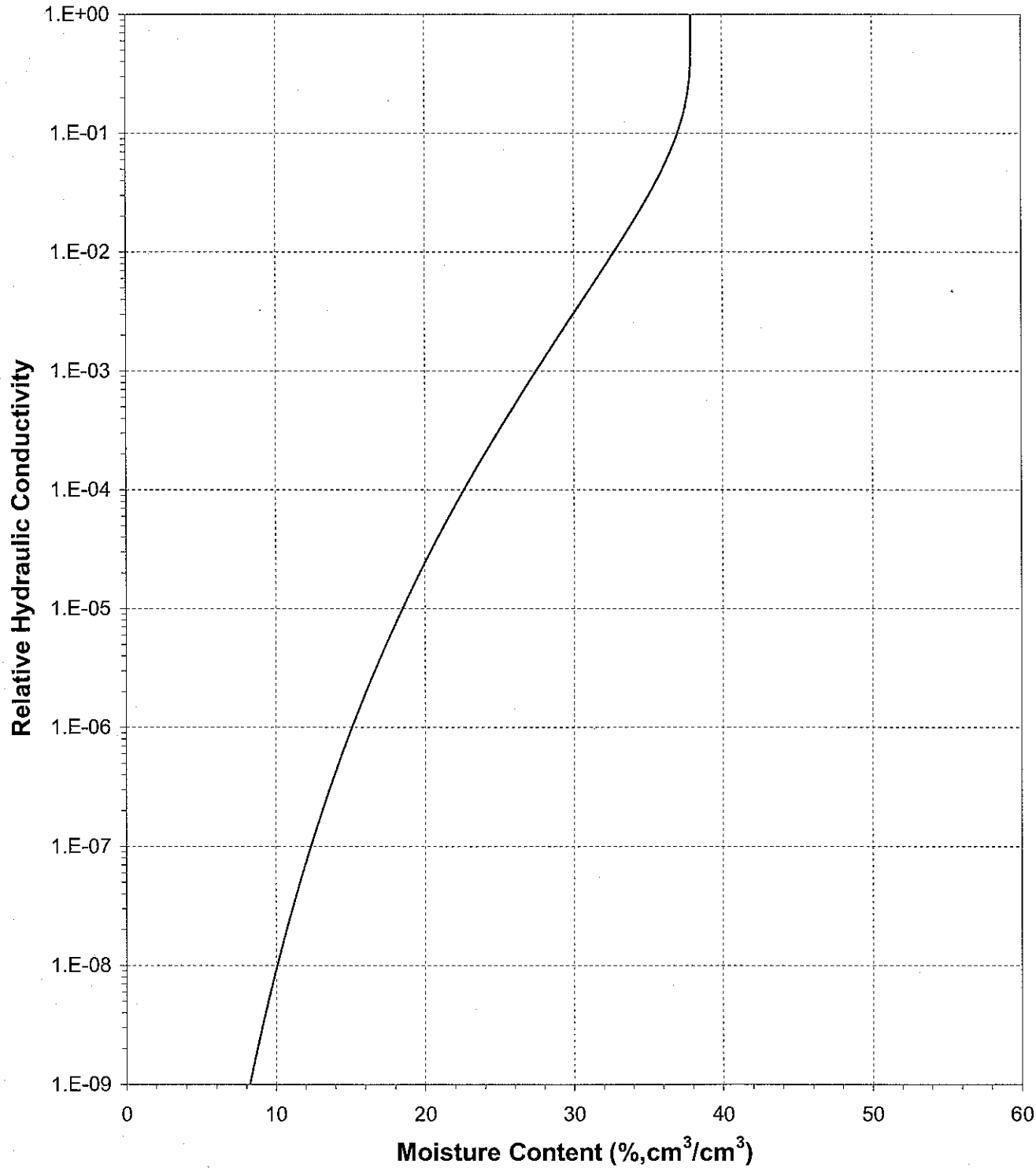
Predicted Water Retention Curve and Data Points

Sample Number: No1-1-1



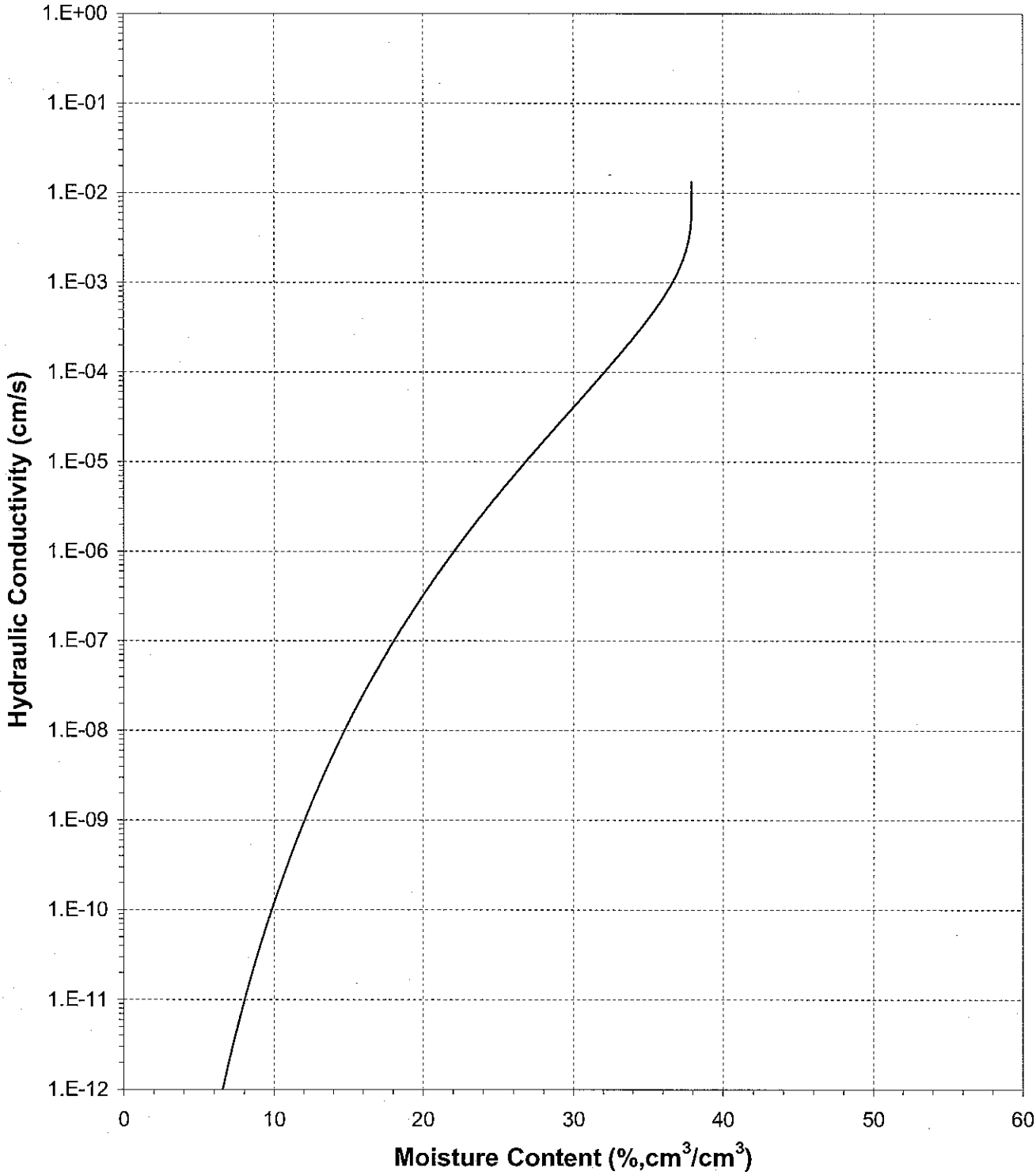
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: No1-1-1



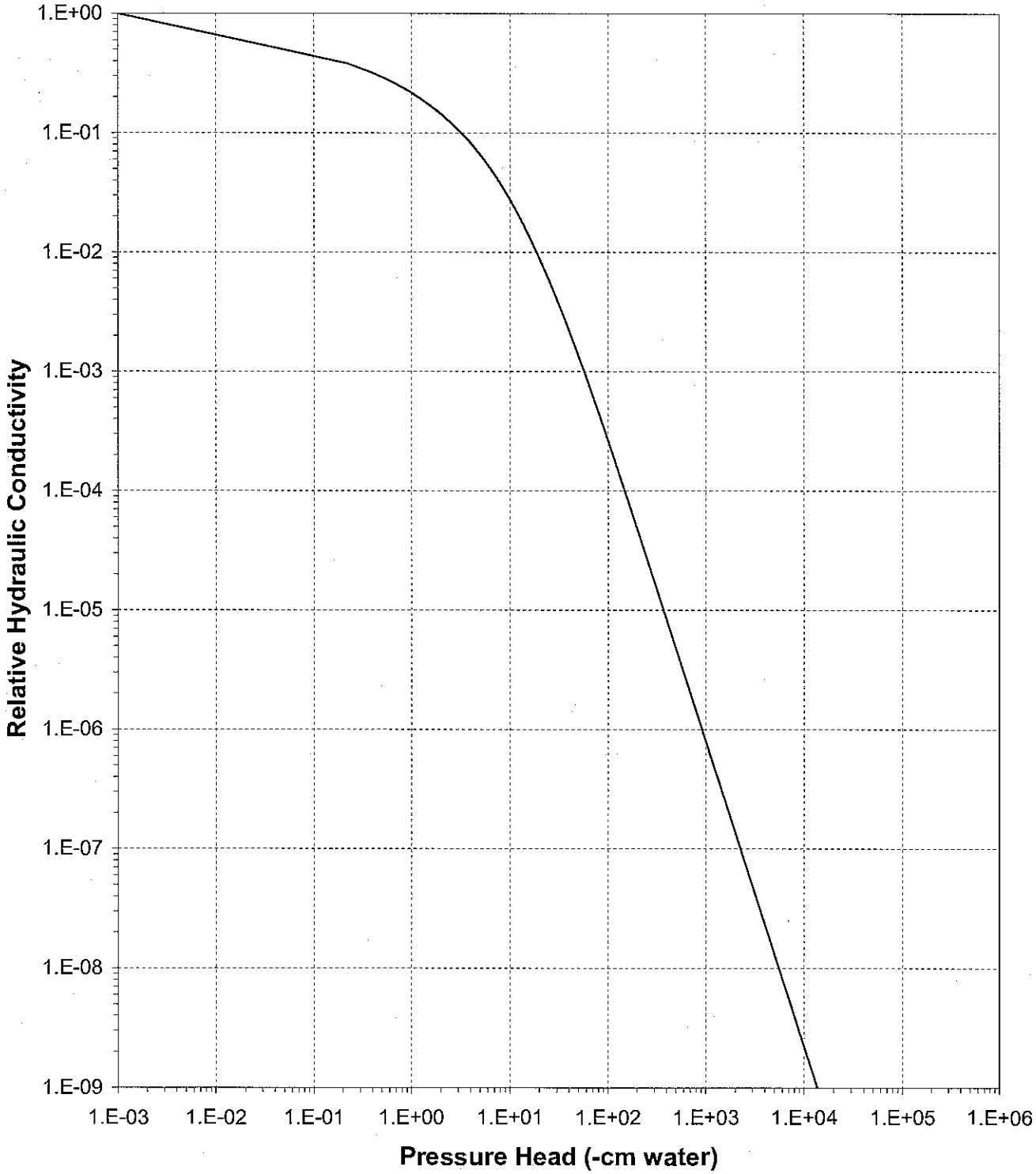
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: No1-1-1



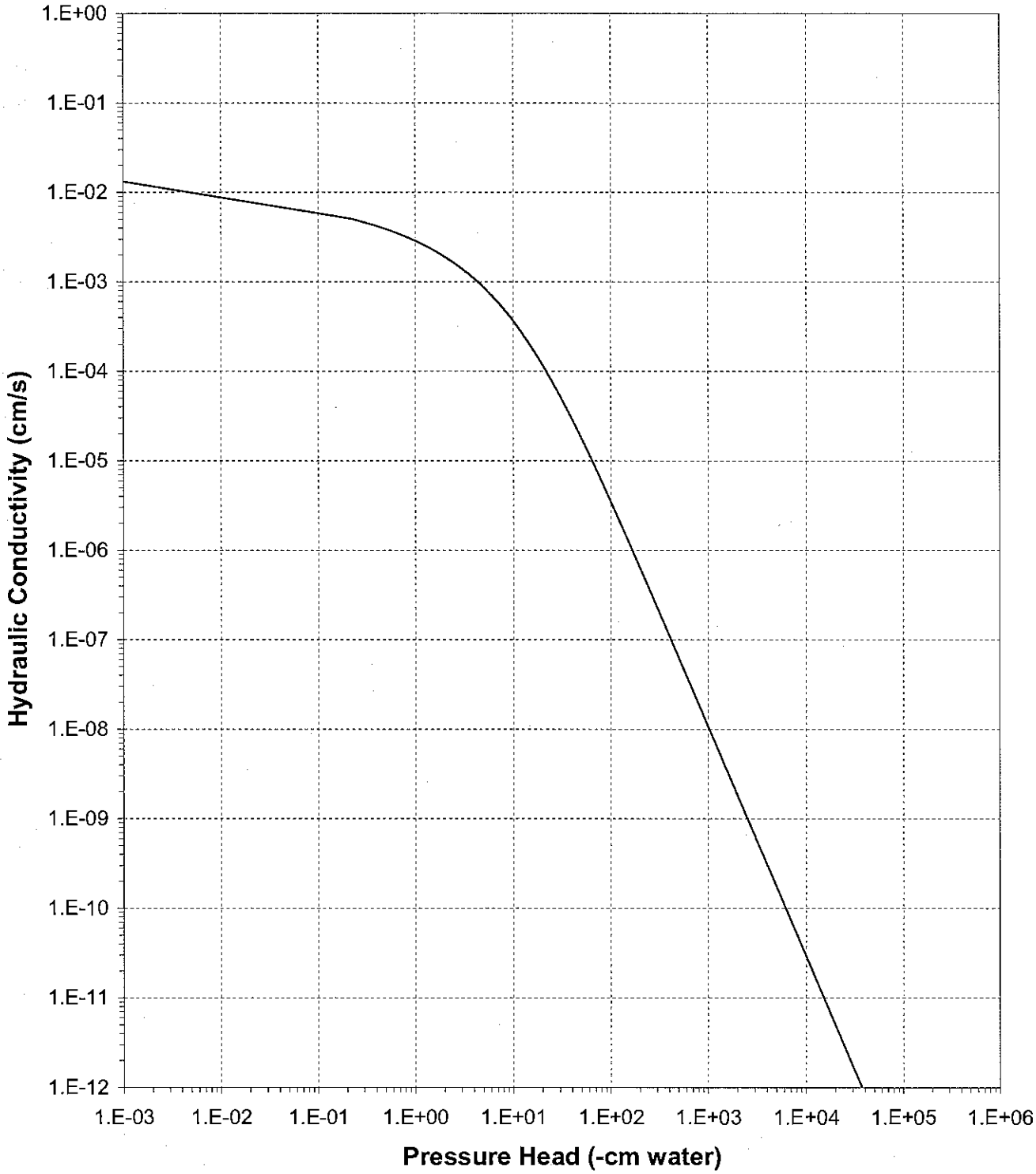
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: No1-1-1



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: No1-1-1



Oversize Correction Data Sheet

Job Name: Golder Associates, Inc.
Job Number: LB06.0155.00
Sample Number: No1-1-1
Ring Number: NA
Depth: NA

Split (3/4", 3/8", #4): #10
Calculated Porosity of Fines (% vol): 47.3

	Coarse Fraction	Fines Fraction	Composite
Subsample Mass (g):	2829.00	926.00	3755.00
Bulk Density (g/cm^3):	2.64	1.39	2.16
Volume of Solids (cm^3):	1073.53	351.39	1424.93
Volume of Voids (cm^3):	0.00	315.30	315.30
Total Volume (cm^3):	1073.53	666.69	1740.22
Volumetric Fraction (%):	61.69	38.31	100.00
Initial Moisture Content (% vol):	0.00	22.88	8.77
Saturated Moisture Content (% vol):	0.00	37.94	14.53
Residual Moisture Content (% vol):	0.00	0.00	0.00
Ksat (cm/sec):	NA	1.3E-02	3.3E-03

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
NA = Not analyzed

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines

Moisture Retention Data

Hanging Column/Pressure Plate/Thermocouple

(Main Drainage Curve)

Job Name: Golder Associates, Inc.
Job Number: LB06.0155.00
Sample Number: No1-1-2
Ring Number: NA
Depth: NA

Dry wt. of sample (g): 215.74
Tare wt., ring (g): 84.73
Tare wt., screen & clamp (g): 25.58
Sample volume (cm^3): 153.88

Saturated weight at 0 cm tension* (g): 393.73
Volume of water[T] in saturated sample (cm^3): 67.68
Saturated moisture content (% vol): 43.98
Sample bulk density (g/cm^3): 1.40

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content[T] (% vol)
Hanging column:	10-Aug-06 / 10:00	393.73	0.00	43.98
	16-Aug-06 / 07:40	391.31	5.00	42.41
	23-Aug-06 / 10:31	381.75	9.50	36.20
	29-Aug-06 / 16:03	365.28	76.50	25.49
Pressure plate:	07-Sep-06 / 09:47	356.66	509.90	19.89

Comments:

* Weight including tares
[T] Assumed density of water is 1.0 g/cm^3

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines

Moisture Retention Data

Water Activity Meter/Relative Humidity Box

(Main Drainage Curve)

Job Name: Golder Associates, Inc.
Job Number: LB06.0155.00
Sample Number: No1-1-2
Ring Number: NA
Depth: NA

Dry weight of water activity meter sample* (g): 160.05
Tare weight, jar (g): 112.86
Sample bulk density (g/cm^3): 1.40

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Water Activity Meter:	08-Aug-06 / 14:30	163.01	12849.5	8.79

Dry weight of relative humidity box sample* (g): 83.06
Tare weight (g): 41.86
Sample bulk density (g/cm^3): 1.40

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Relative humidity box:	14-Aug-06 / 14:00	83.72	851293	2.25

Comments:

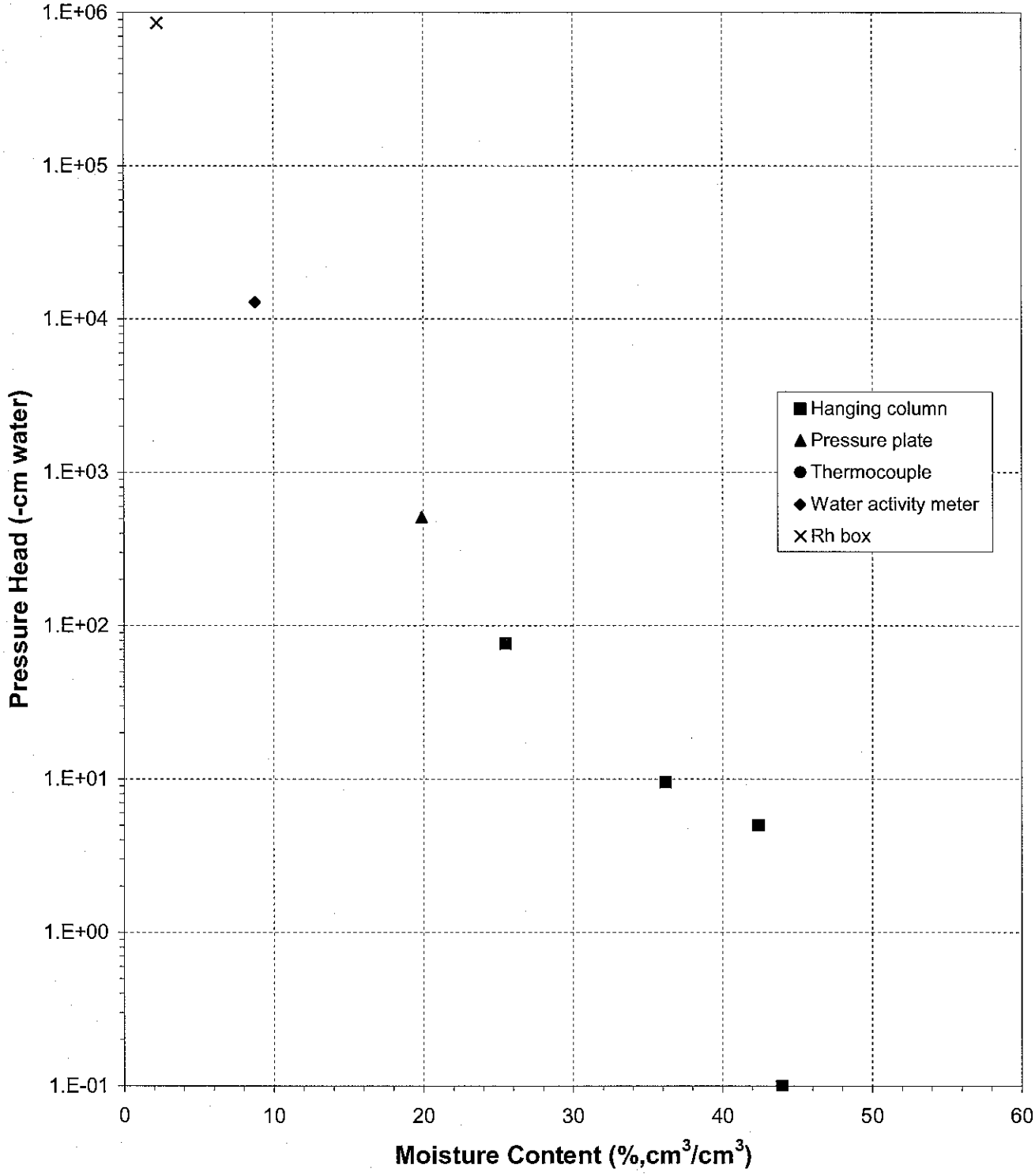
* Weight including tares

† Assumed density of water is 1.0 g/cm^3

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines

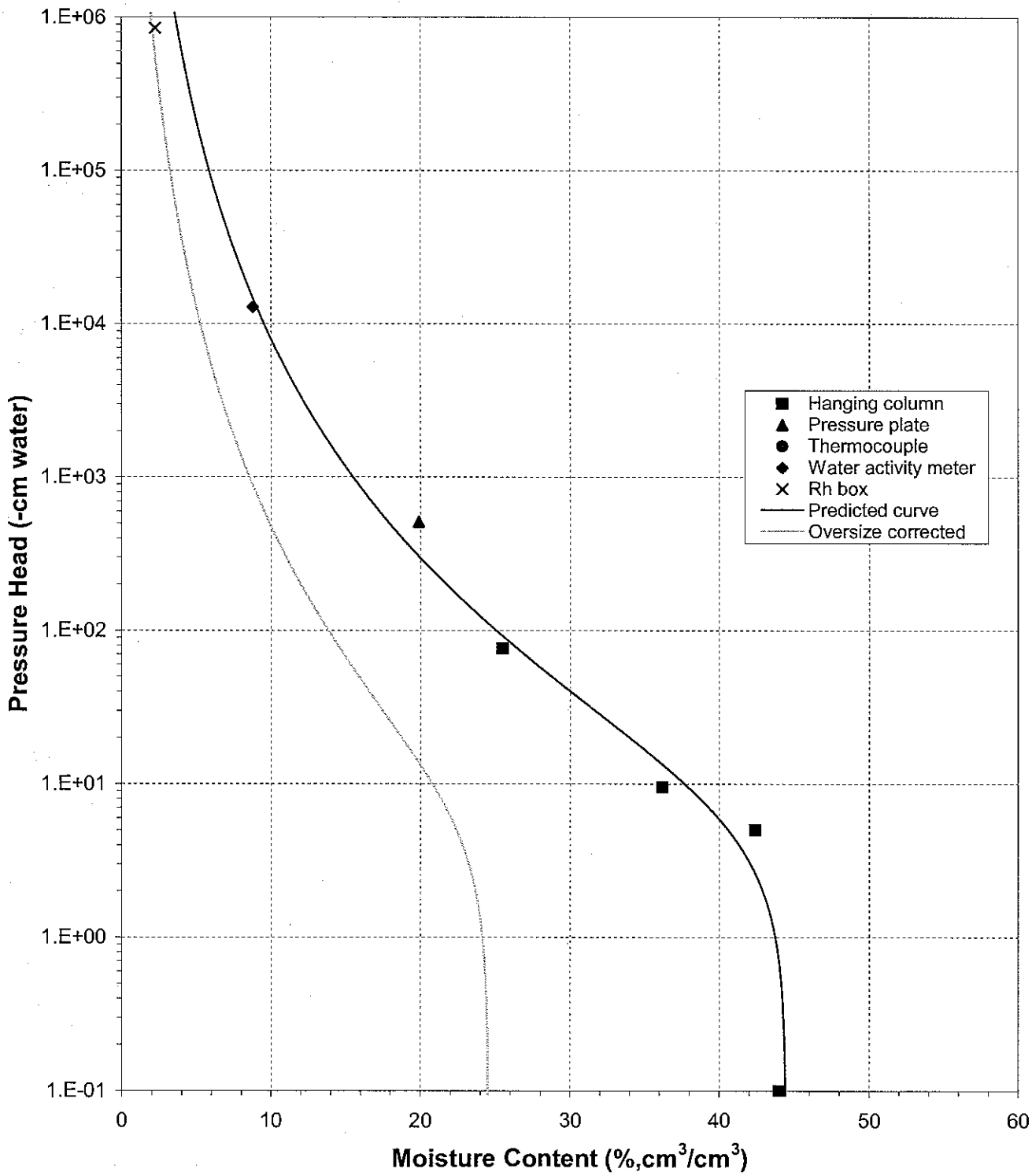
Water Retention Data Points

Sample Number: No1-1-2



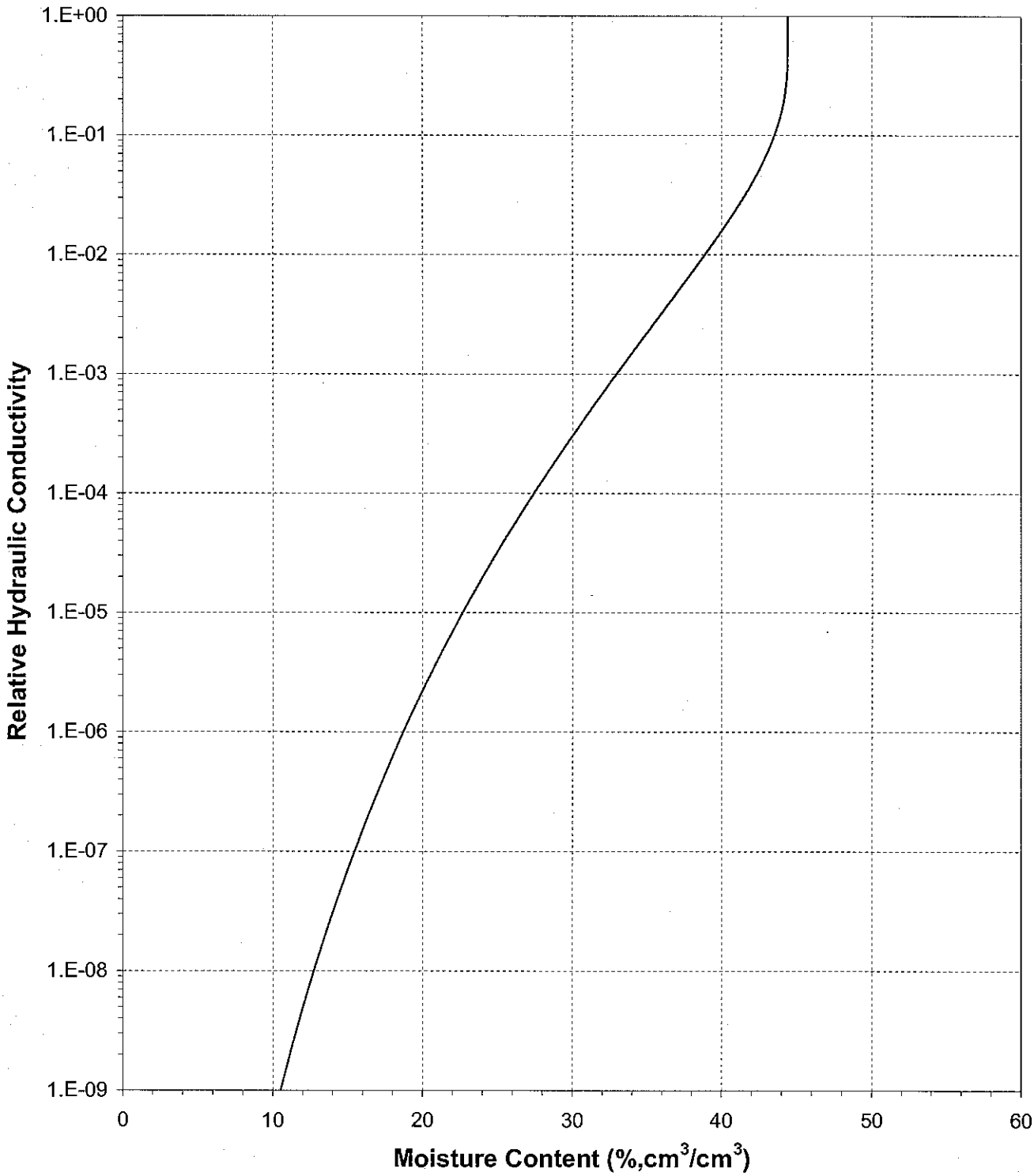
Predicted Water Retention Curve and Data Points

Sample Number: No1-1-2



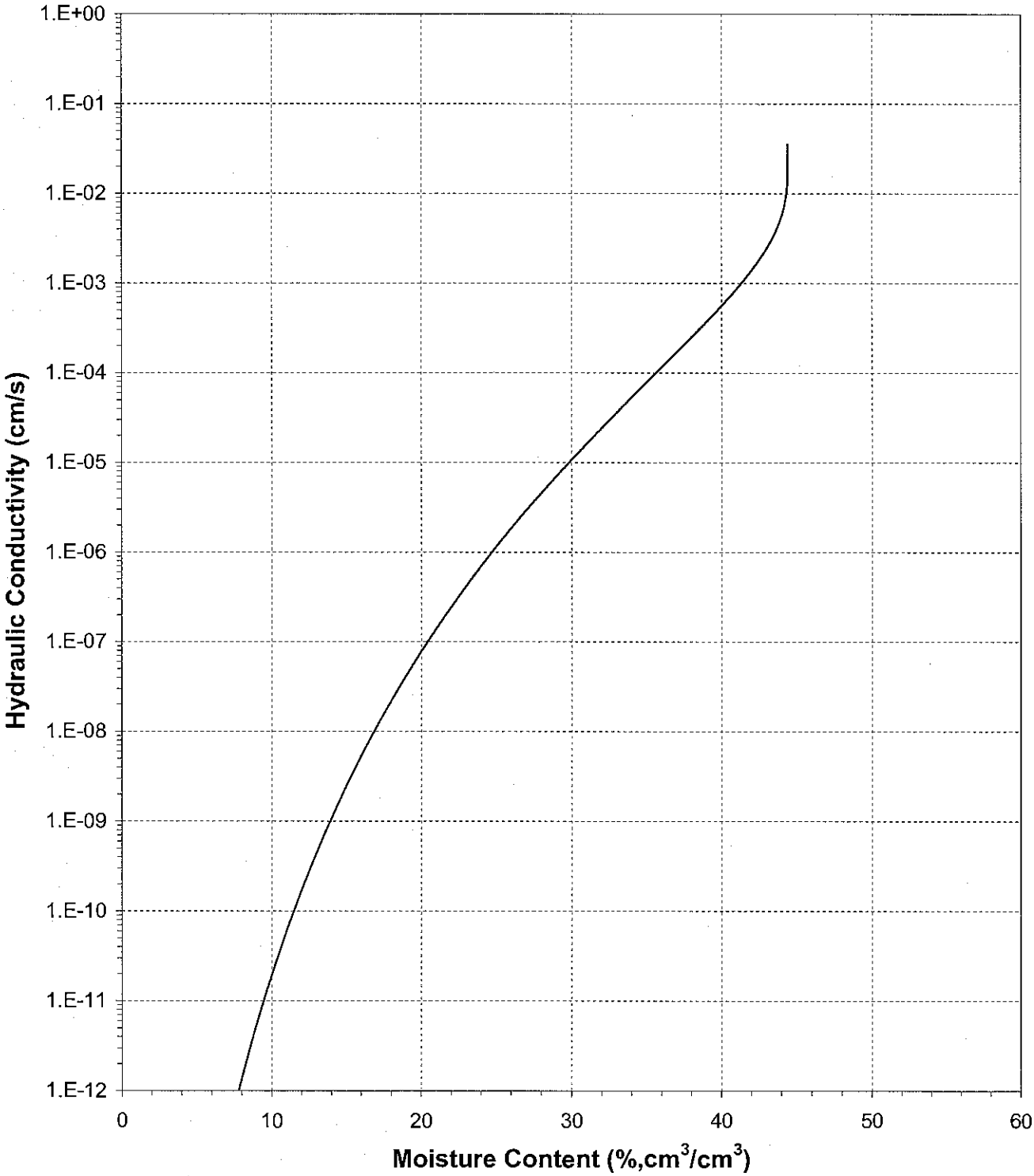
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: No1-1-2



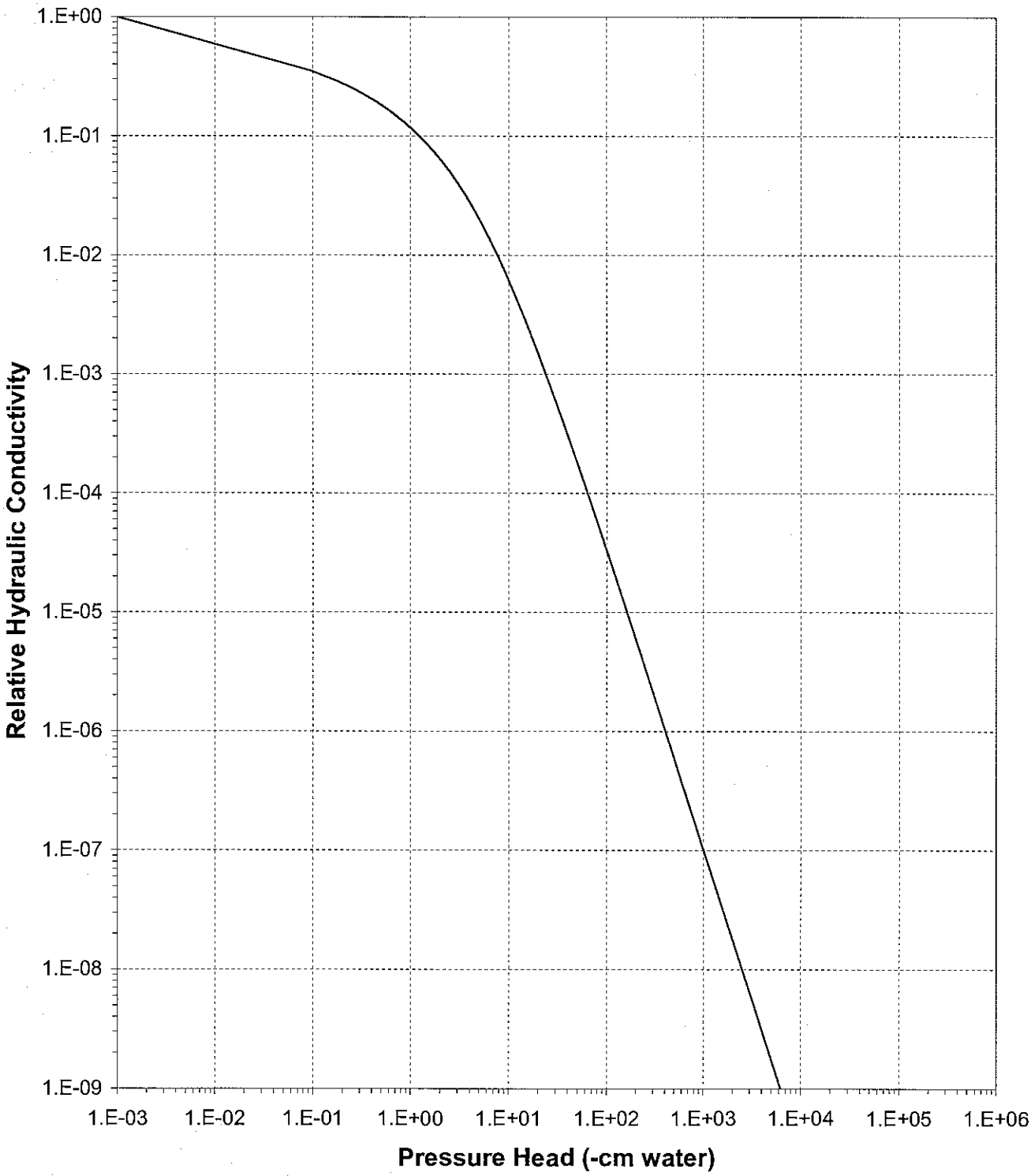
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: No1-1-2



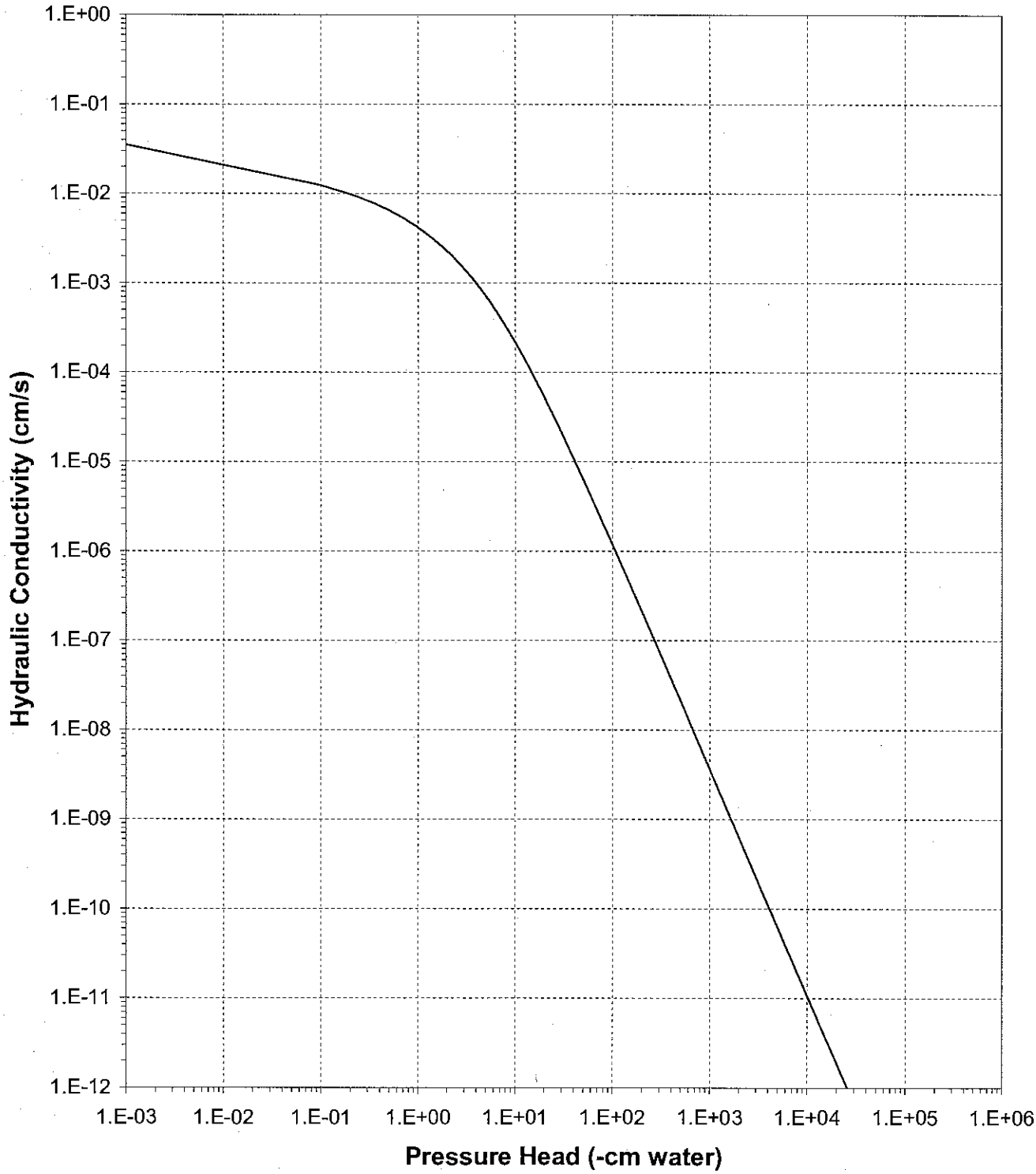
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: No1-1-2



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: No1-1-2



Oversize Correction Data Sheet

Job Name: Golder Associates, Inc.
Job Number: LB06.0155.00
Sample Number: No1-1-2
Ring Number: NA
Depth: NA

Split (3/4", 3/8", #4): #10
Calculated Porosity of Fines (% vol): 47.1

	Coarse Fraction	Fines Fraction	Composite
Subsample Mass (g):	2776.00	1810.00	4586.00
Bulk Density (g/cm^3):	2.65	1.40	1.96
Volume of Solids (cm^3):	1047.29	682.85	1730.13
Volume of Voids (cm^3):	0.00	608.21	608.21
Total Volume (cm^3):	1047.29	1291.05	2338.34
Volumetric Fraction (%):	44.79	55.21	100.00
Initial Moisture Content (% vol):	0.00	21.33	11.78
Saturated Moisture Content (% vol):	0.00	44.45	24.54
Residual Moisture Content (% vol):	0.00	0.00	0.00
Ksat (cm/sec):	NA	3.5E-02	1.4E-02

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
NA = Not analyzed

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines

Moisture Retention Data

Hanging Column/Pressure Plate/Thermocouple

(Main Drainage Curve)

Job Name: Golder Associates, Inc.
Job Number: LB06.0155.00
Sample Number: No1-2-1
Ring Number: NA
Depth: NA

Dry wt. of sample (g): 230.67
Tare wt., ring (g): 73.87
Tare wt., screen & clamp (g): 25.49
Sample volume (cm^3): 165.39

Saturated weight at 0 cm tension* (g): 397.81
Volume of water[T] in saturated sample (cm^3): 67.78
Saturated moisture content (% vol): 40.98
Sample bulk density (g/cm^3): 1.39

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content[T] (% vol)
Hanging column:	10-Aug-06 / 09:10	397.81	0.00	40.98
	11-Aug-06 / 07:34	391.37	5.00	37.09
	23-Aug-06 / 10:25	388.69	9.50	35.47
	29-Aug-06 / 16:00	374.16	76.50	26.68
Pressure plate:	07-Sep-06 / 09:48	362.44	509.90	19.60

Comments:

* Weight including tares
[T] Assumed density of water is 1.0 g/cm^3

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines

Moisture Retention Data

Water Activity Meter/Relative Humidity Box

(Main Drainage Curve)

Job Name: Golder Associates, Inc.
Job Number: LB06.0155.00
Sample Number: No1-2-1
Ring Number: NA
Depth: NA

Dry weight of water activity meter sample* (g): 156.74
Tare weight, jar (g): 113.08
Sample bulk density (g/cm^3): 1.39

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Water Activity Meter:	11-Aug-06 / 13:45	159.33	12135.6	8.27

Dry weight of relative humidity box sample* (g): 82.96
Tare weight (g): 44.95
Sample bulk density (g/cm^3): 1.39

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Relative humidity box:	14-Aug-06 / 14:00	83.59	851293	2.31

Comments:

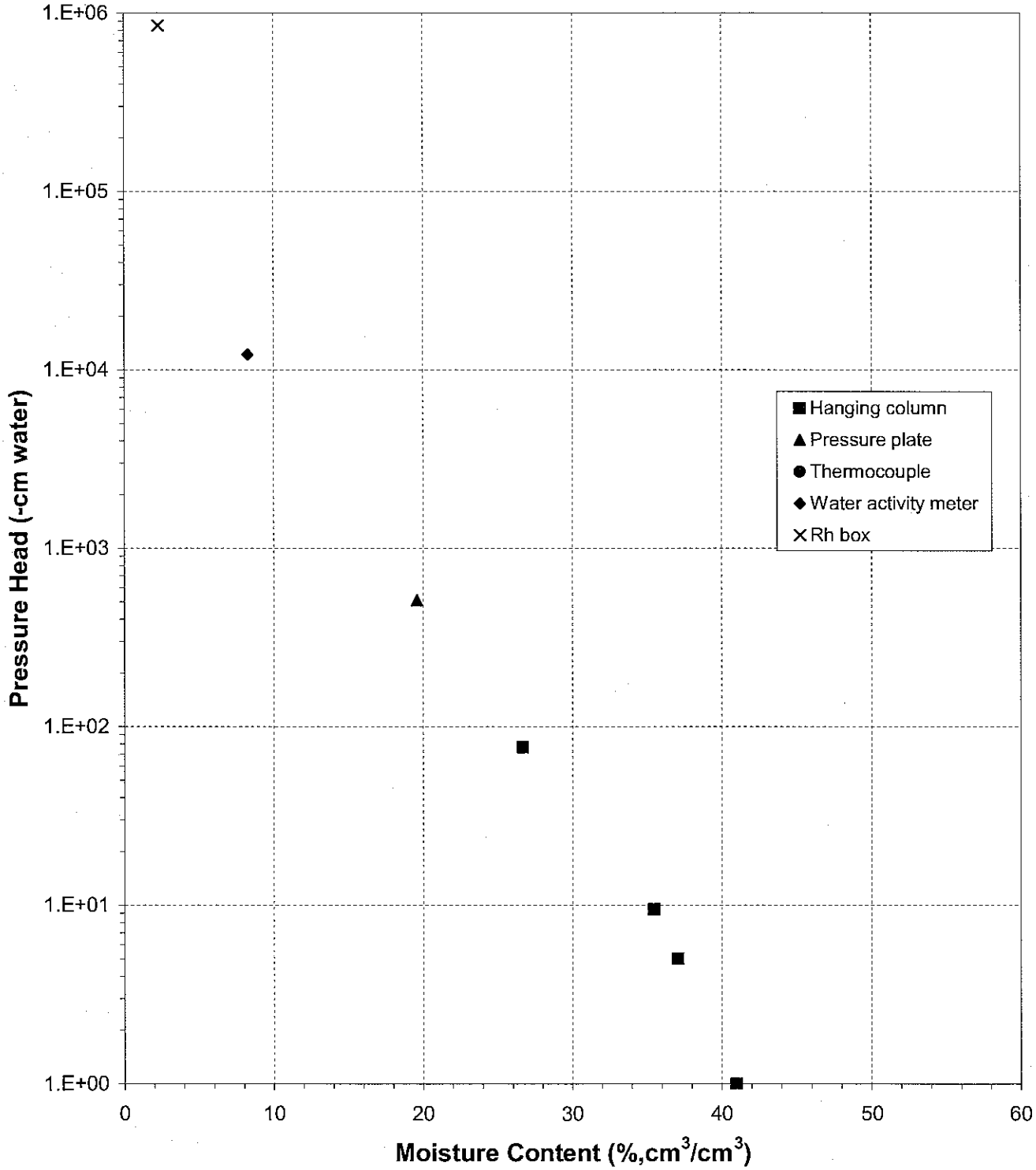
* Weight including tares

† Assumed density of water is 1.0 g/cm^3

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines

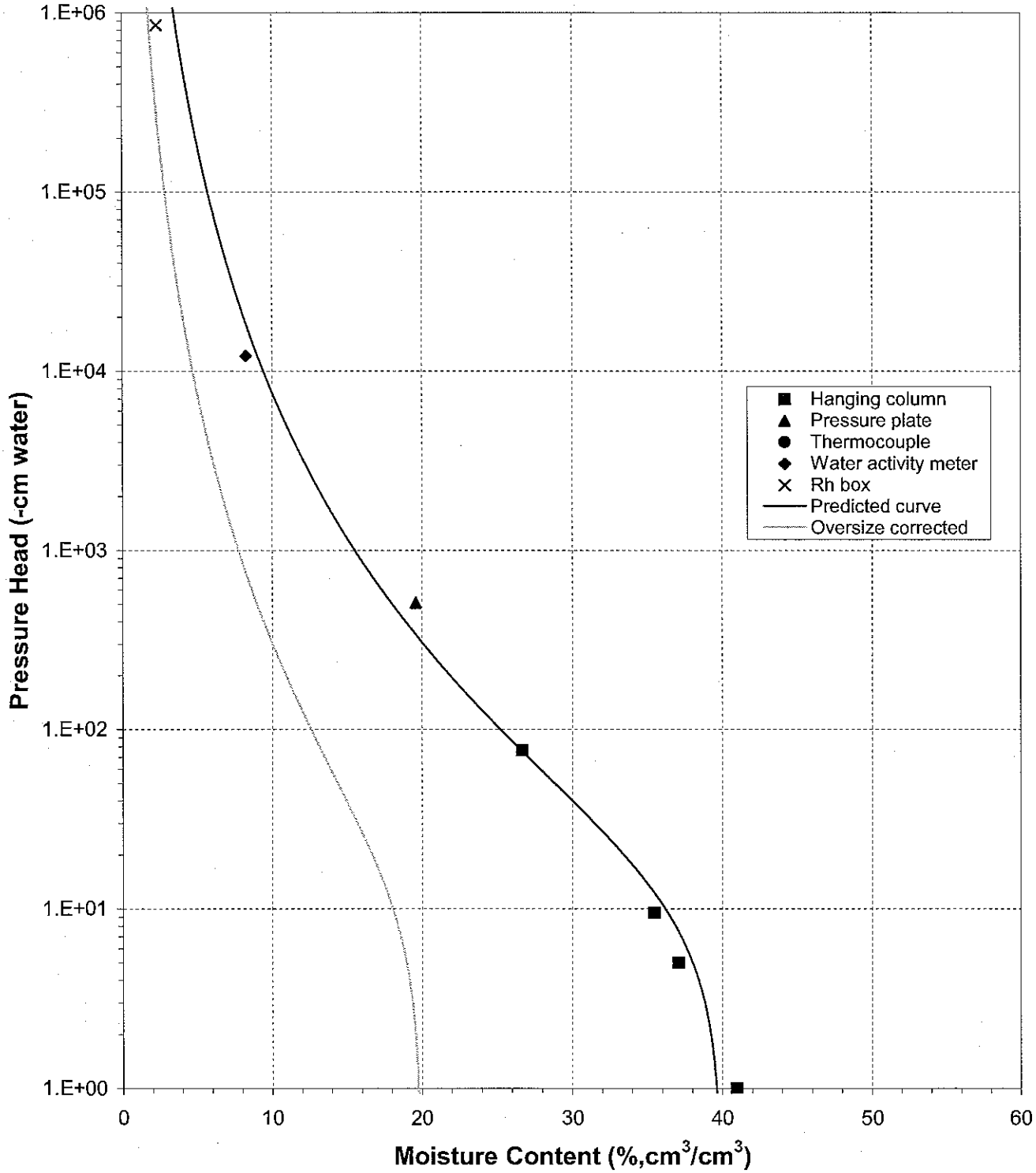
Water Retention Data Points

Sample Number: No1-2-1



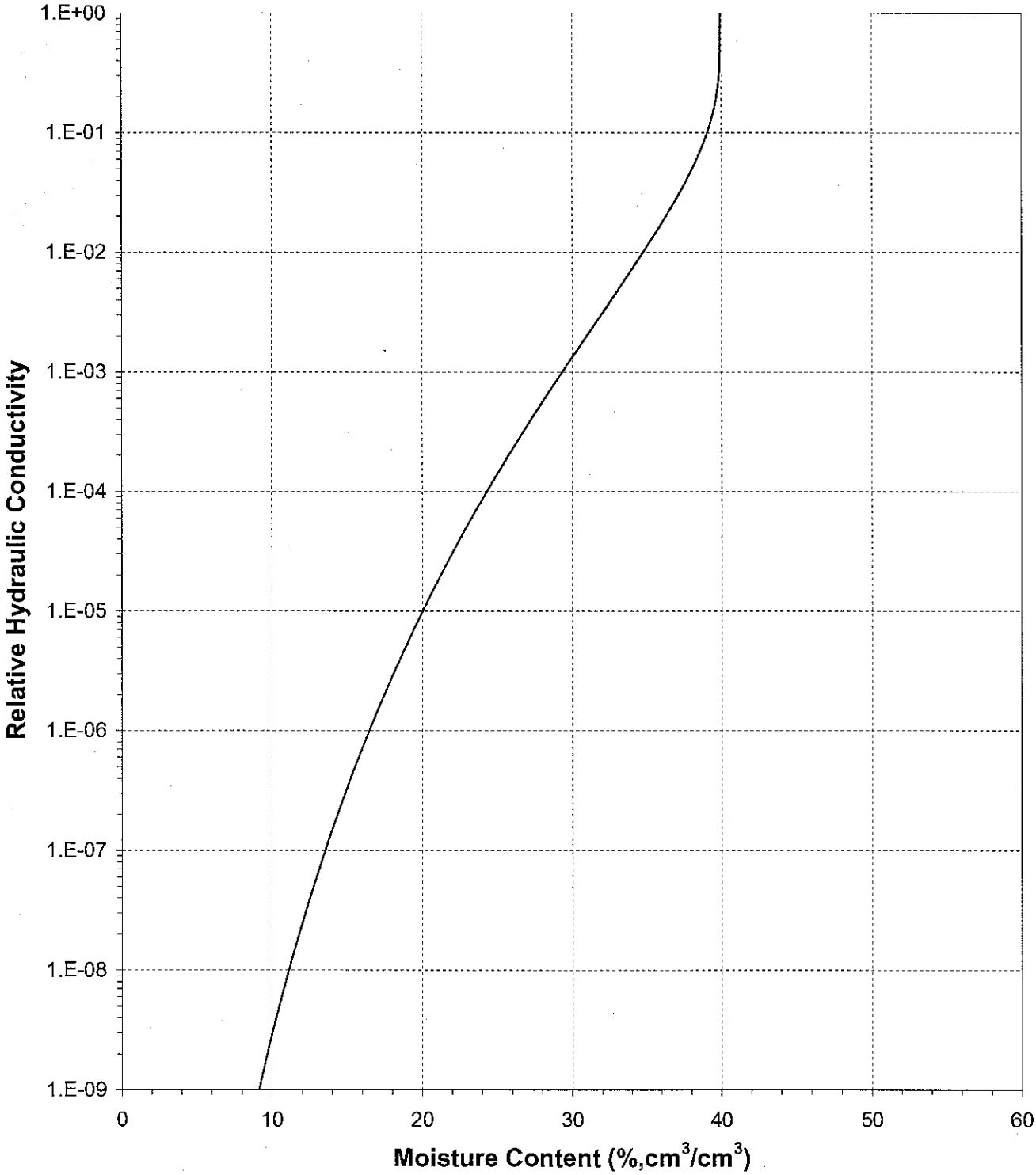
Predicted Water Retention Curve and Data Points

Sample Number: No1-2-1



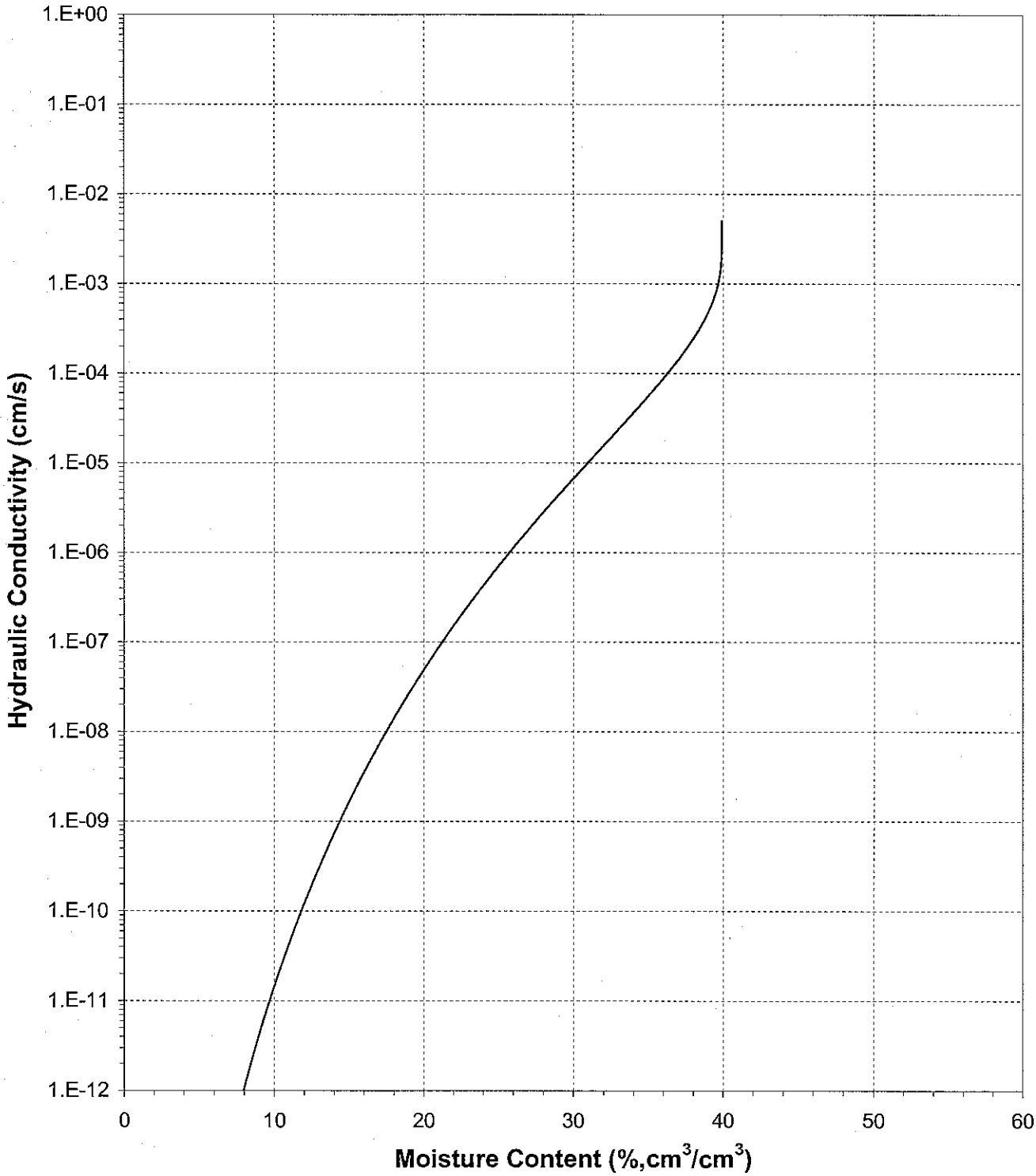
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: No1-2-1



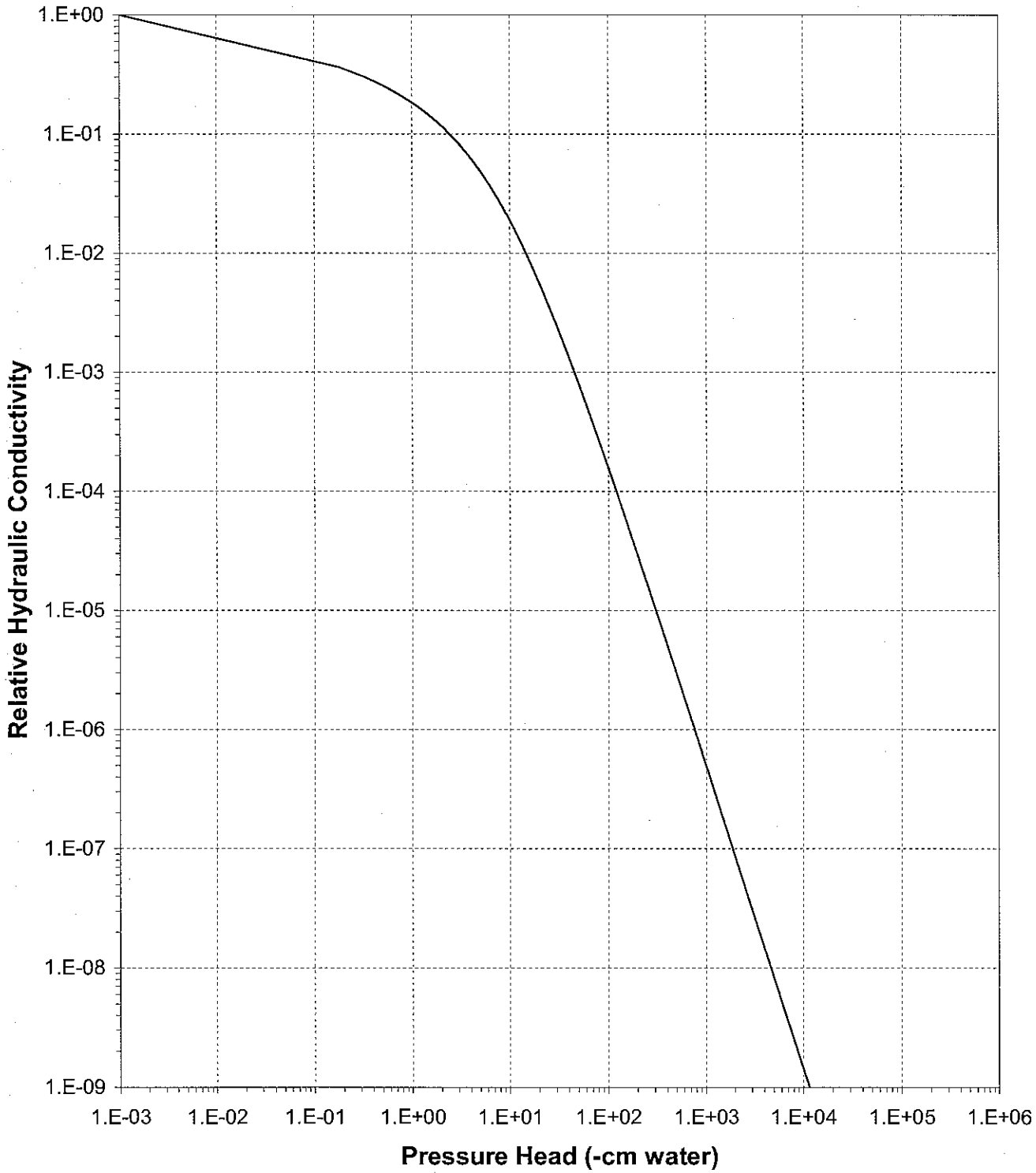
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: No1-2-1



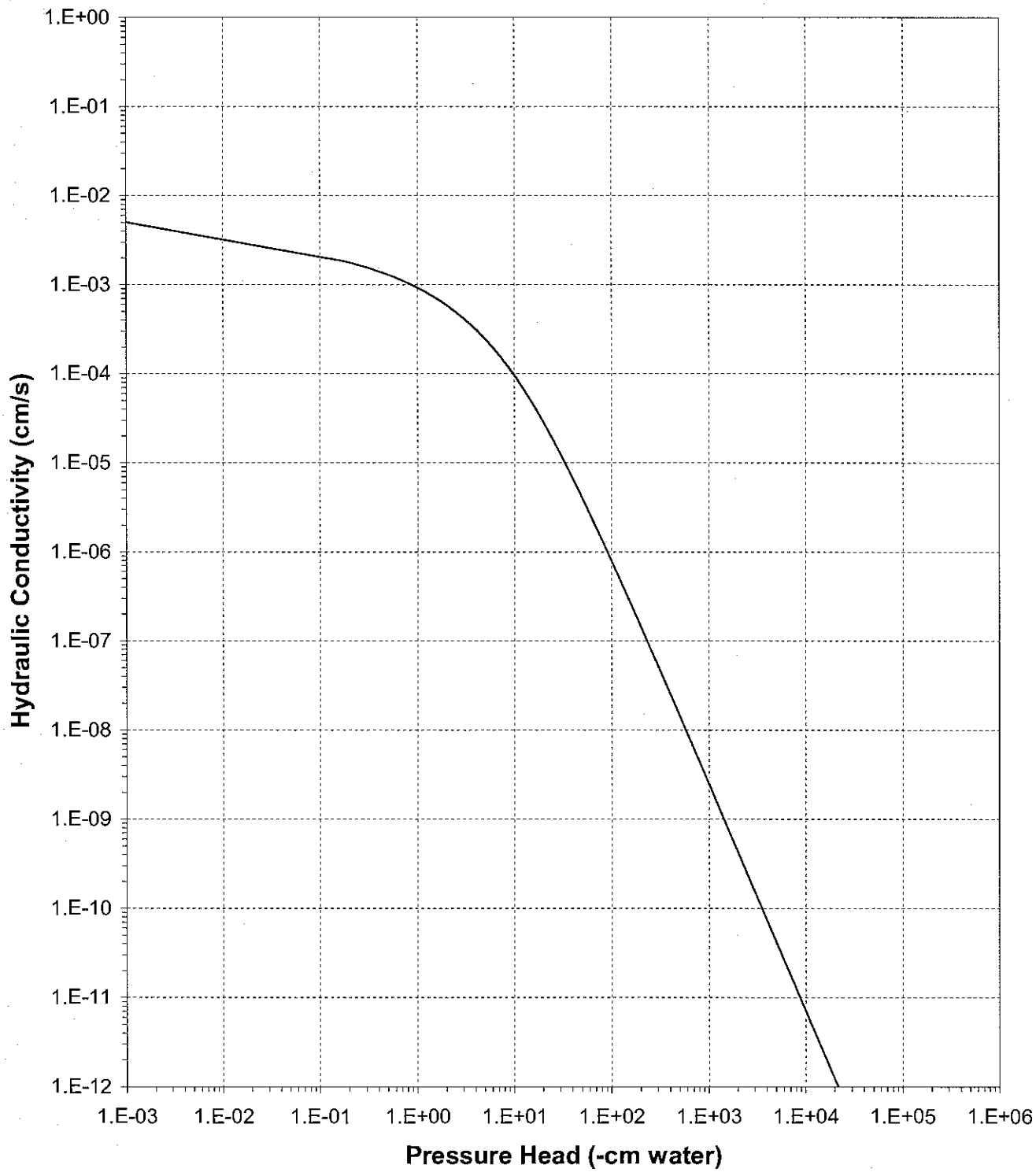
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: No1-2-1



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: No1-2-1



Oversize Correction Data Sheet

Job Name: Golder Associates, Inc.
Job Number: LB06.0155.00
Sample Number: No1-2-1
Ring Number: NA
Depth: NA

Split (3/4", 3/8", #4): #10
Calculated Porosity of Fines (% vol): 46.7

	Coarse Fraction	Fines Fraction	Composite
Subsample Mass (g):	4236.00	2246.00	6482.00
Bulk Density (g/cm^3):	2.62	1.39	2.01
Volume of Solids (cm^3):	1618.06	857.92	2475.98
Volume of Voids (cm^3):	0.00	752.46	752.46
Total Volume (cm^3):	1618.06	1610.38	3228.44
Volumetric Fraction (%):	50.12	49.88	100.00
Initial Moisture Content (% vol):	0.00	23.25	11.60
Saturated Moisture Content (% vol):	0.00	39.93	19.92
Residual Moisture Content (% vol):	0.00	0.00	0.00
Ksat (cm/sec):	NA	5.0E-03	1.7E-03

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
NA = Not analyzed

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines

Moisture Retention Data

Hanging Column/Pressure Plate/Thermocouple

(Main Drainage Curve)

Job Name: Golder Associates, Inc.
Job Number: LB06.0155.00
Sample Number: No1-2-2
Ring Number: NA
Depth: NA

Dry wt. of sample (g): 203.43
Tare wt., ring (g): 64.74
Tare wt., screen & clamp (g): 26.72
Sample volume (cm^3): 143.78

Saturated weight at 0 cm tension* (g): 356.11
Volume of water[T] in saturated sample (cm^3): 61.22
Saturated moisture content (% vol): 42.58
Sample bulk density (g/cm^3): 1.41

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content[T] (% vol)
Hanging column:	10-Aug-06 / 09:35	356.11	0.00	42.58
	16-Aug-06 / 07:39	353.44	5.00	40.72
	23-Aug-06 / 10:30	345.16	9.50	34.96
	29-Aug-06 / 16:02	330.18	76.50	24.54
Pressure plate:	07-Sep-06 / 09:46	322.67	509.90	19.32

Comments:

* Weight including tares
[I] Assumed density of water is 1.0 g/cm^3

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines

Moisture Retention Data

Water Activity Meter/Relative Humidity Box

(Main Drainage Curve)

Job Name: Golder Associates, Inc.
Job Number: LB06.0155.00
Sample Number: No1-2-2
Ring Number: NA
Depth: NA

Dry weight of water activity meter sample* (g): 155.67
Tare weight, jar (g): 112.44
Sample bulk density (g/cm^3): 1.41

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Water Activity Meter:	11-Aug-06 / 15:10	158.19	11727.7	8.25

Dry weight of relative humidity box sample* (g): 76.91
Tare weight (g): 40.58
Sample bulk density (g/cm^3): 1.41

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Relative humidity box:	14-Aug-06 / 14:00	77.47	851293	2.18

Comments:

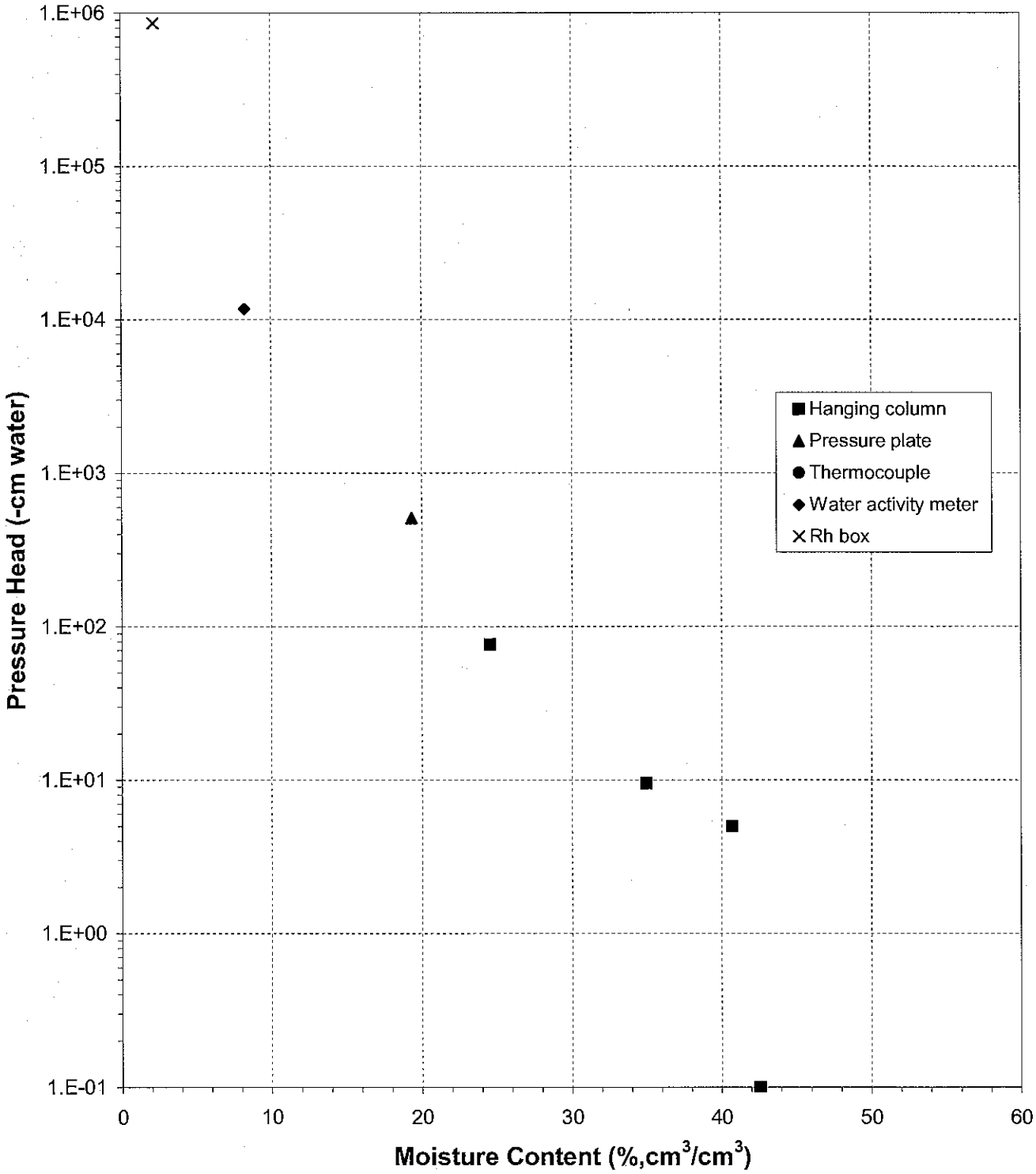
* Weight including tares

† Assumed density of water is 1.0 g/cm^3

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines

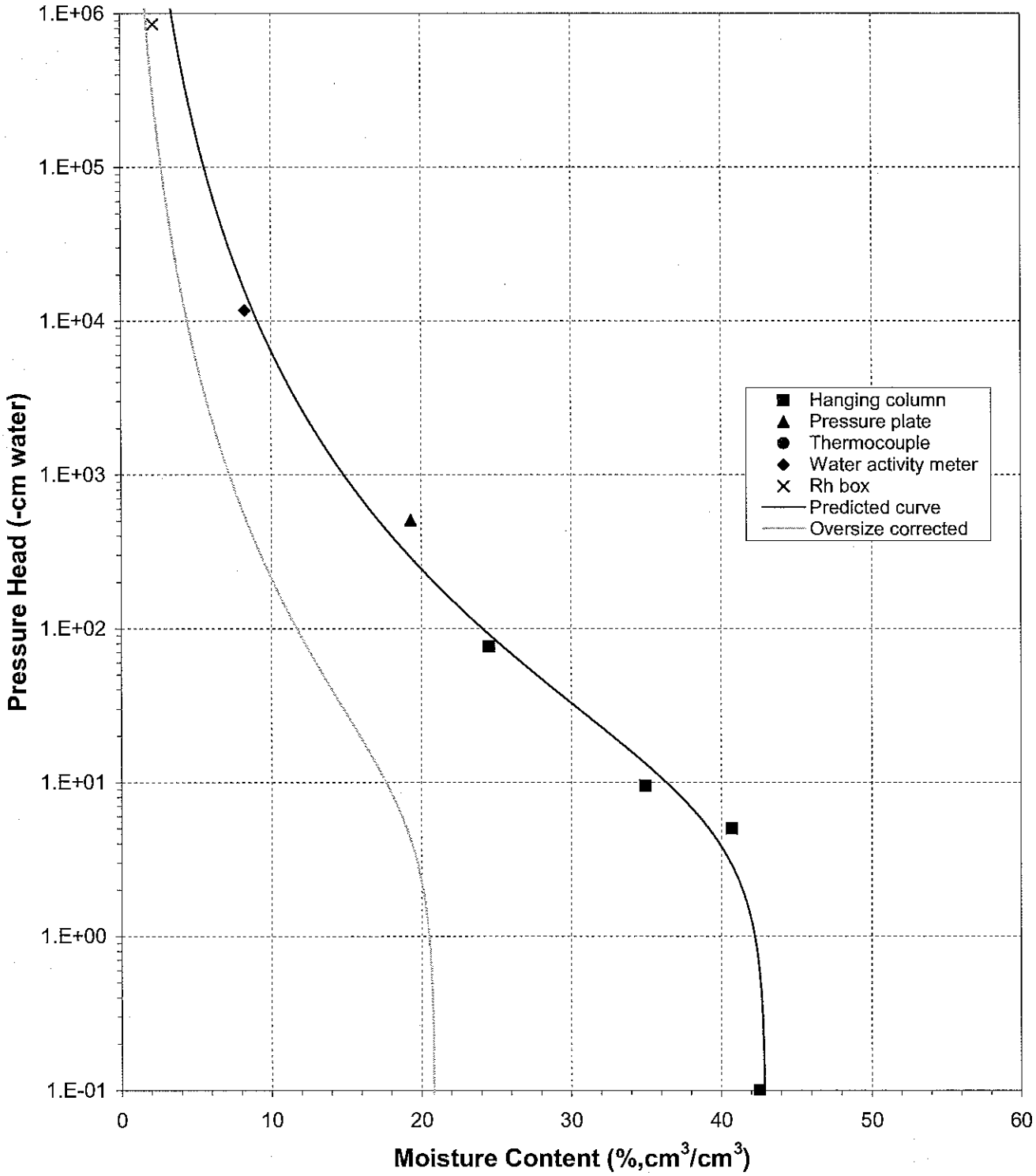
Water Retention Data Points

Sample Number: No1-2-2



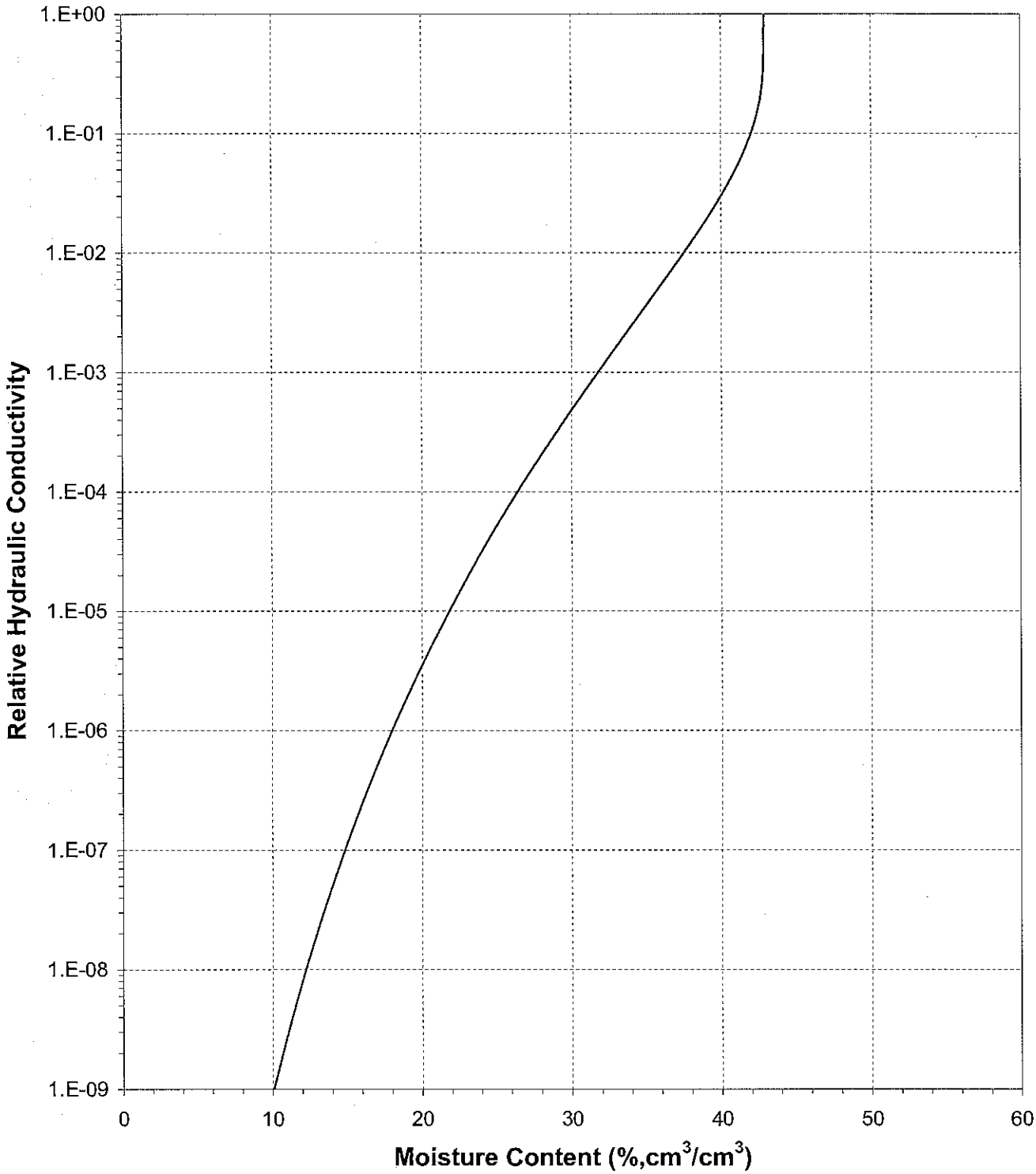
Predicted Water Retention Curve and Data Points

Sample Number: No1-2-2



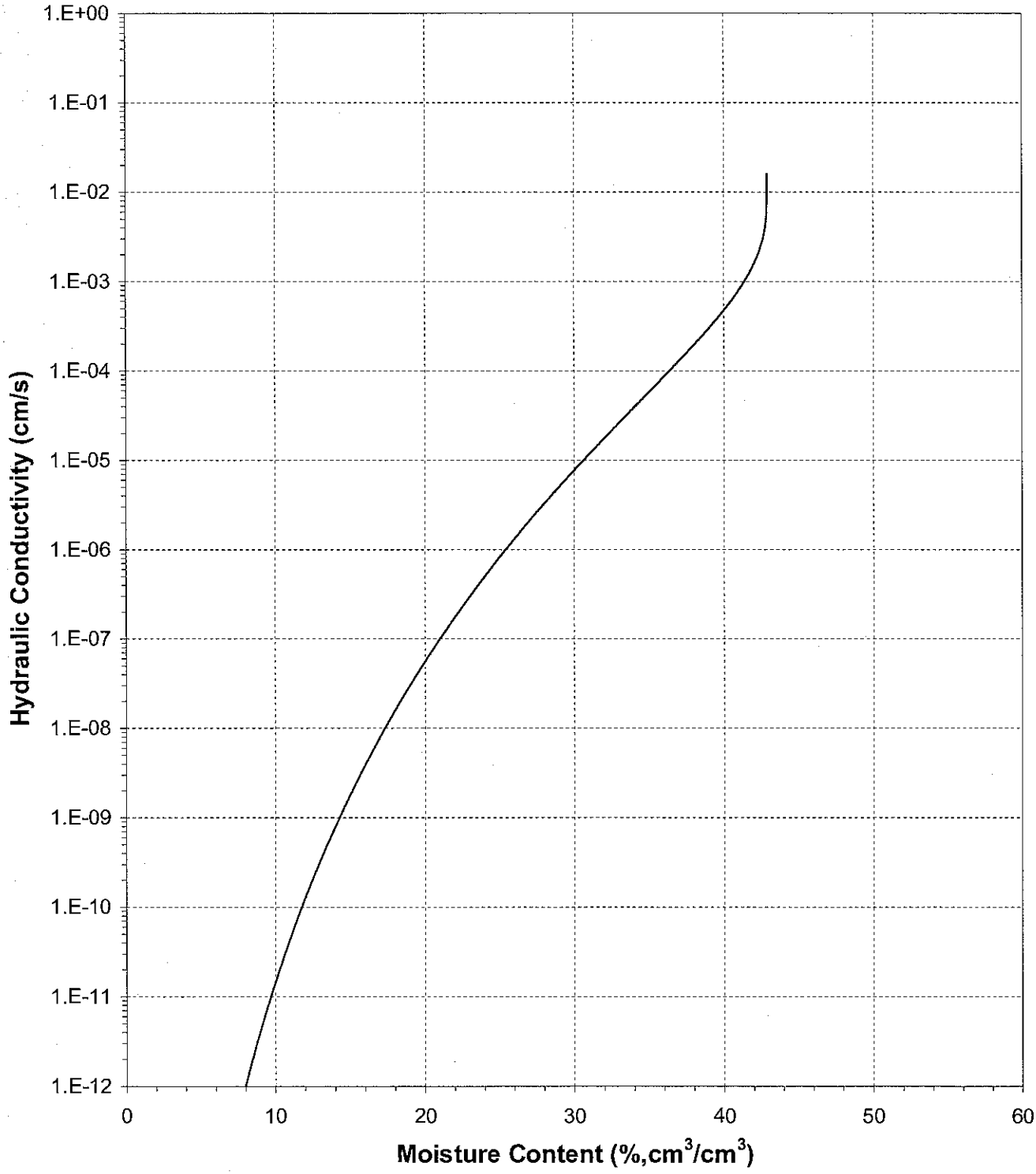
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: No1-2-2



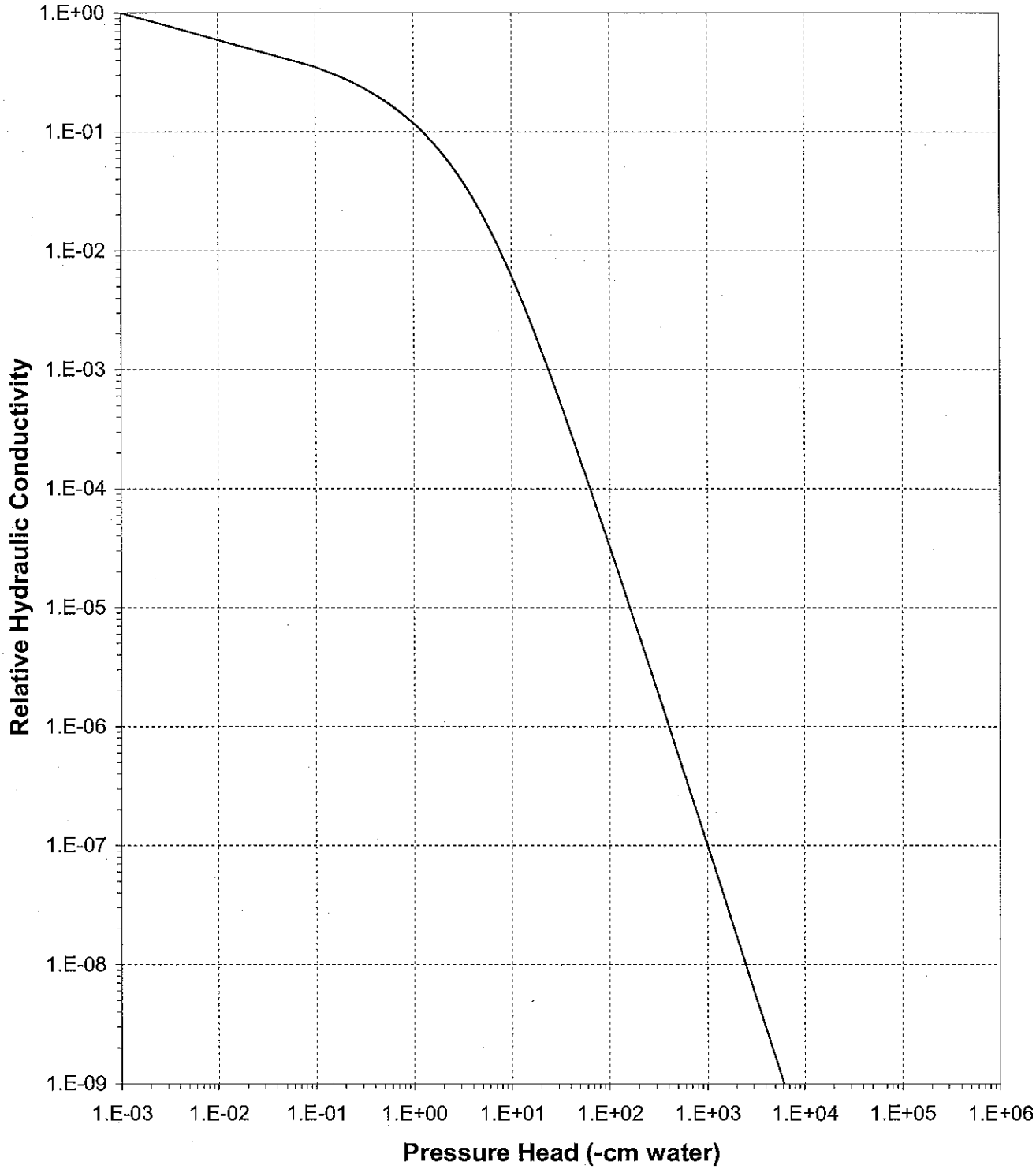
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: No1-2-2



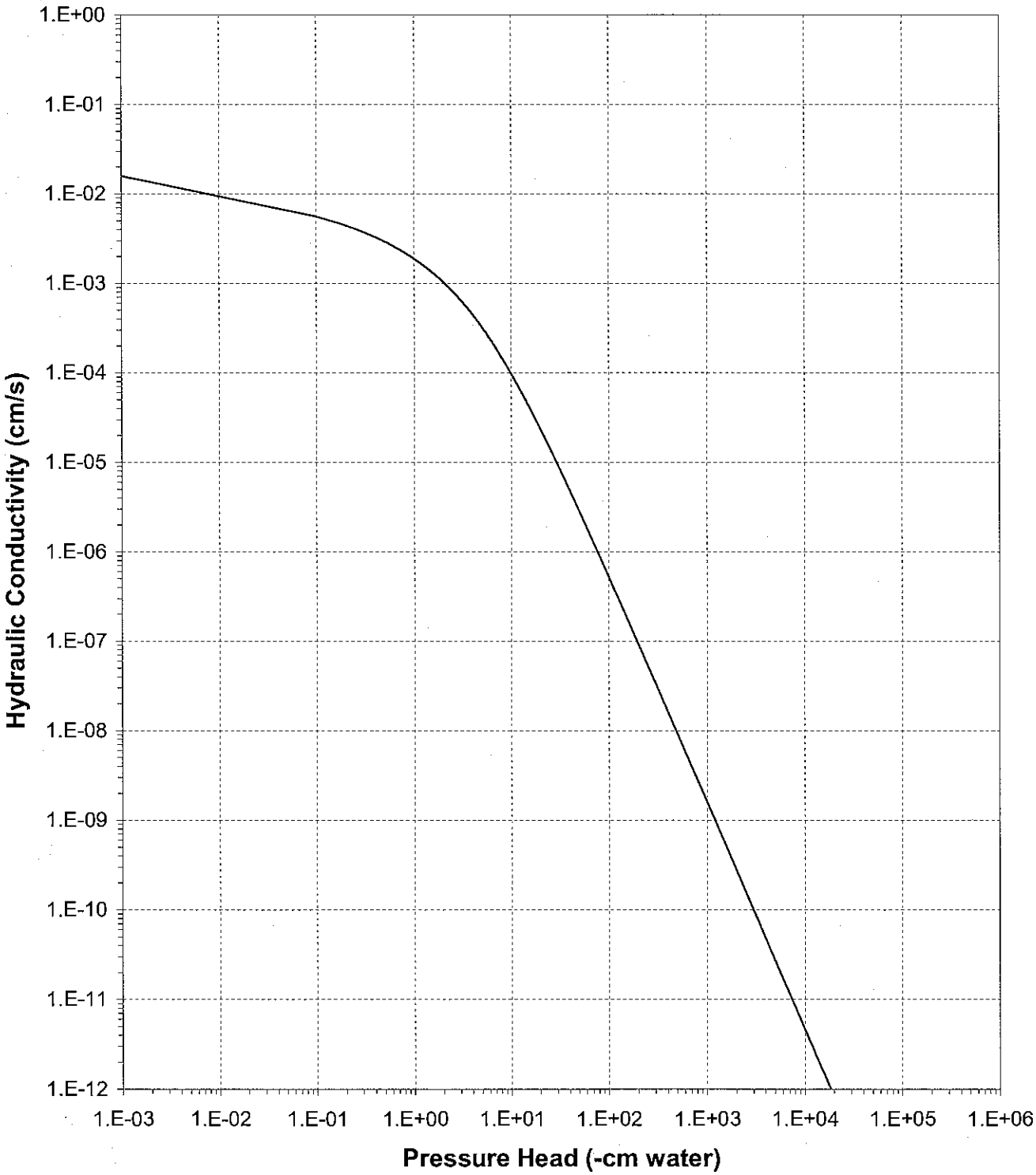
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: No1-2-2



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: No1-2-2



Daniel B. Stephens & Associates, Inc.

Oversize Correction Data Sheet

Job Name: Golder Associates, Inc.
Job Number: LB06.0155.00
Sample Number: No1-2-2
Ring Number: NA
Depth: NA

Split (3/4", 3/8", #4): #10
Calculated Porosity of Fines (% vol): 45.7

	Coarse Fraction	Fines Fraction	Composite
Subsample Mass (g):	2592.00	1330.00	3922.00
Bulk Density (g/cm^3):	2.60	1.41	2.03
Volume of Solids (cm^3):	995.36	510.74	1506.10
Volume of Voids (cm^3):	0.00	429.29	429.29
Total Volume (cm^3):	995.36	940.03	1935.39
Volumetric Fraction (%):	51.43	48.57	100.00
Initial Moisture Content (% vol):	0.00	21.45	10.42
Saturated Moisture Content (% vol):	0.00	42.94	20.86
Residual Moisture Content (% vol):	0.00	0.00	0.00
Ksat (cm/sec):	NA	1.6E-02	5.4E-03

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
NA = Not analyzed

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines

Moisture Retention Data

Hanging Column/Pressure Plate/Thermocouple

(Main Drainage Curve)

Job Name: Golder Associates, Inc.
Job Number: LB06.0155.00
Sample Number: No1-3-1
Ring Number: NA
Depth: NA

Dry wt. of sample (g): 218.40
Tare wt., ring (g): 92.02
Tare wt., screen & clamp (g): 27.67
Sample volume (cm^3): 157.16

Saturated weight at 0 cm tension* (g): 398.45
Volume of water[T] in saturated sample (cm^3): 60.36
Saturated moisture content (% vol): 38.41
Sample bulk density (g/cm^3): 1.39

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content[T] (% vol)
Hanging column:	10-Aug-06 / 09:00	398.45	0.00	38.41
	16-Aug-06 / 07:30	392.15	5.00	34.40
	23-Aug-06 / 10:20	390.03	9.50	33.05
	29-Aug-06 / 15:40	383.35	76.50	28.80
Pressure plate:	07-Sep-06 / 09:51	374.51	509.90	23.17

Comments:

* Weight including tares
[I] Assumed density of water is 1.0 g/cm^3

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines

Moisture Retention Data

Water Activity Meter/Relative Humidity Box

(Main Drainage Curve)

Job Name: Golder Associates, Inc.
Job Number: LB06.0155.00
Sample Number: No1-3-1
Ring Number: NA
Depth: NA

Dry weight of water activity meter sample* (g): 154.15
Tare weight, jar (g): 113.65
Sample bulk density (g/cm^3): 1.39

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content^T (% vol)
Water Activity Meter:	11-Aug-06 / 15:55	156.43	13461.4	7.82

Dry weight of relative humidity box sample* (g): 88.11
Tare weight (g): 42.87
Sample bulk density (g/cm^3): 1.39

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content^T (% vol)
Relative humidity box:	14-Aug-06 / 14:00	88.63	851293	1.60

Comments:

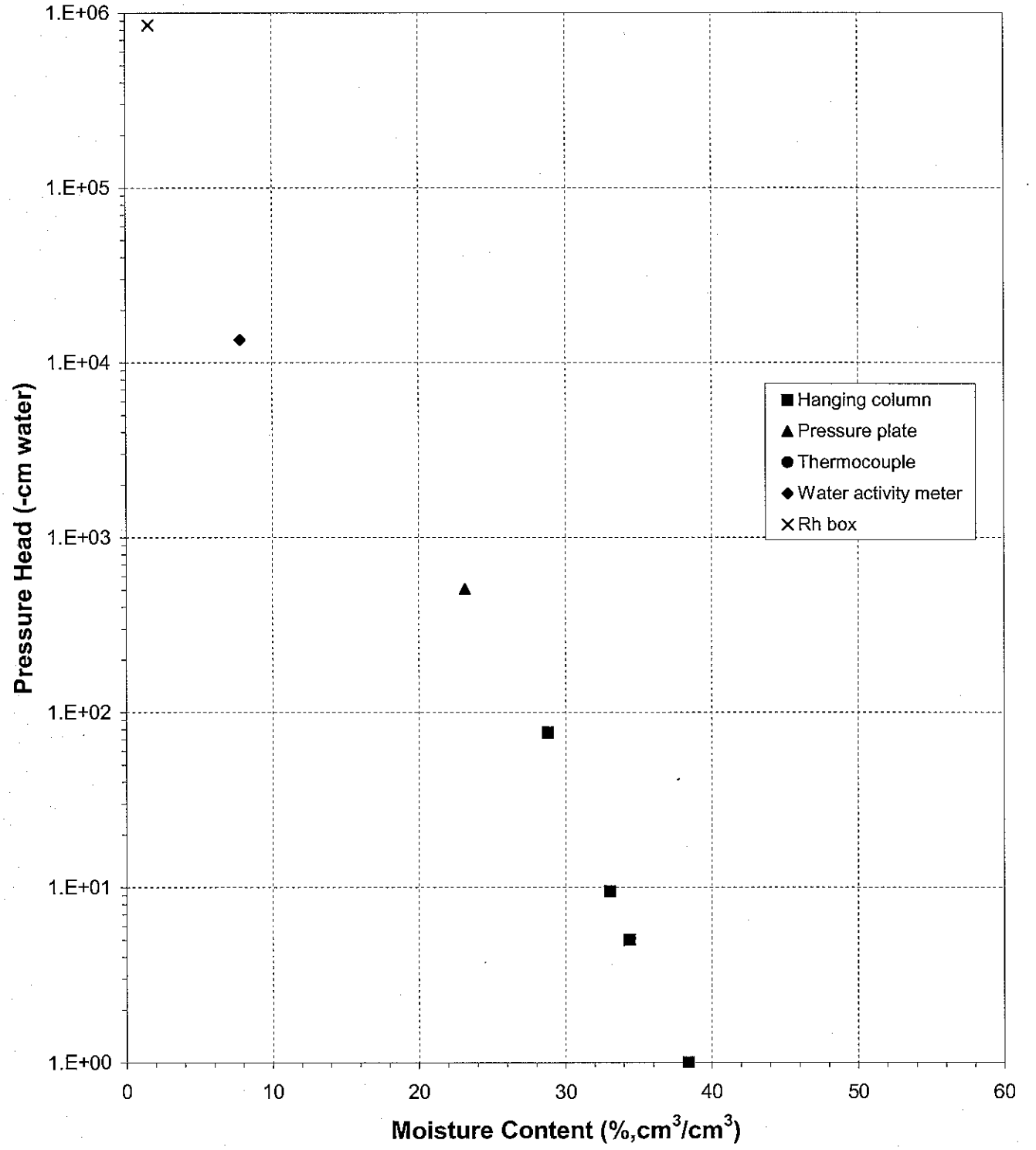
* Weight including tares

† Assumed density of water is 1.0 g/cm^3

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines

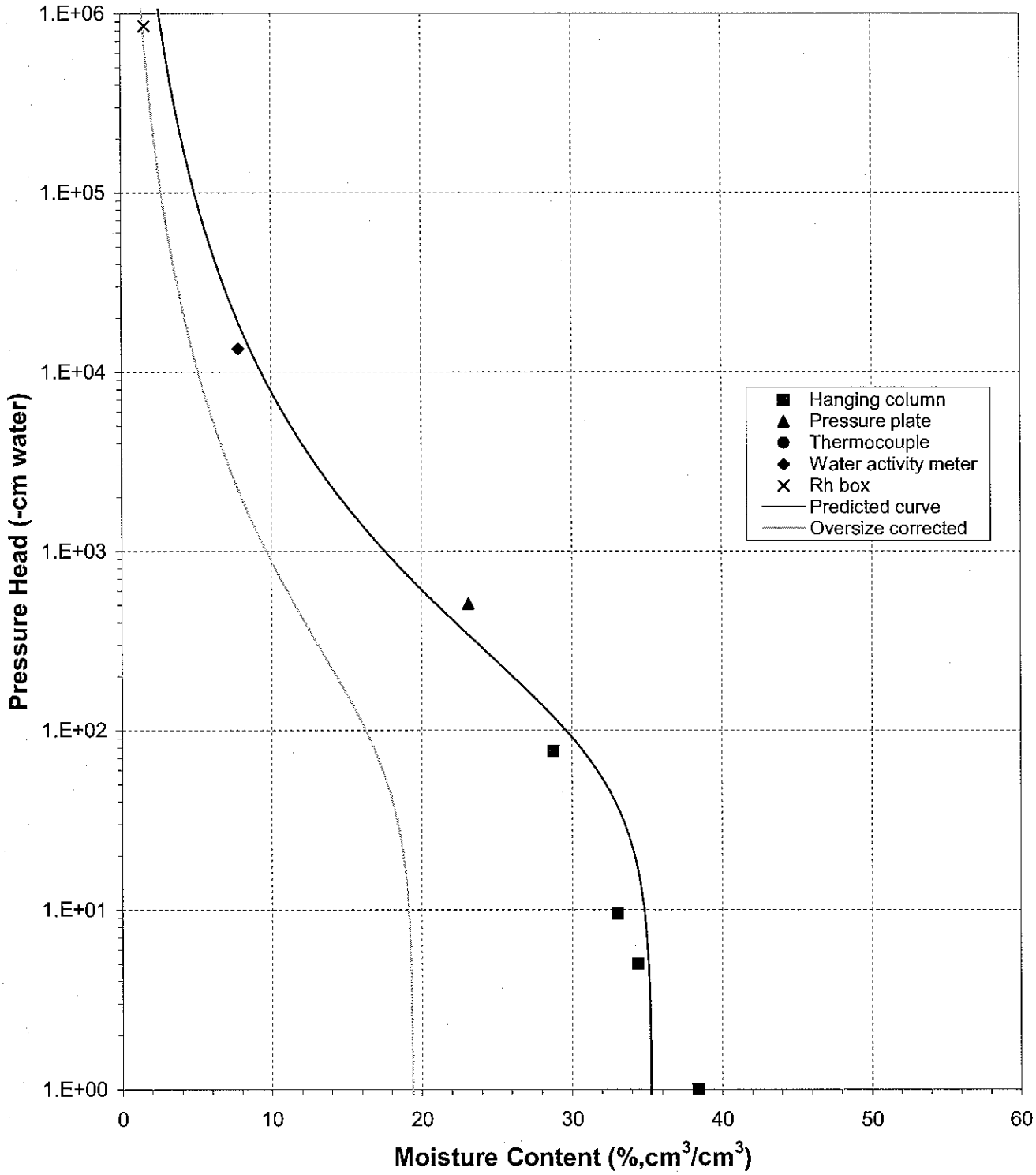
Water Retention Data Points

Sample Number: No1-3-1



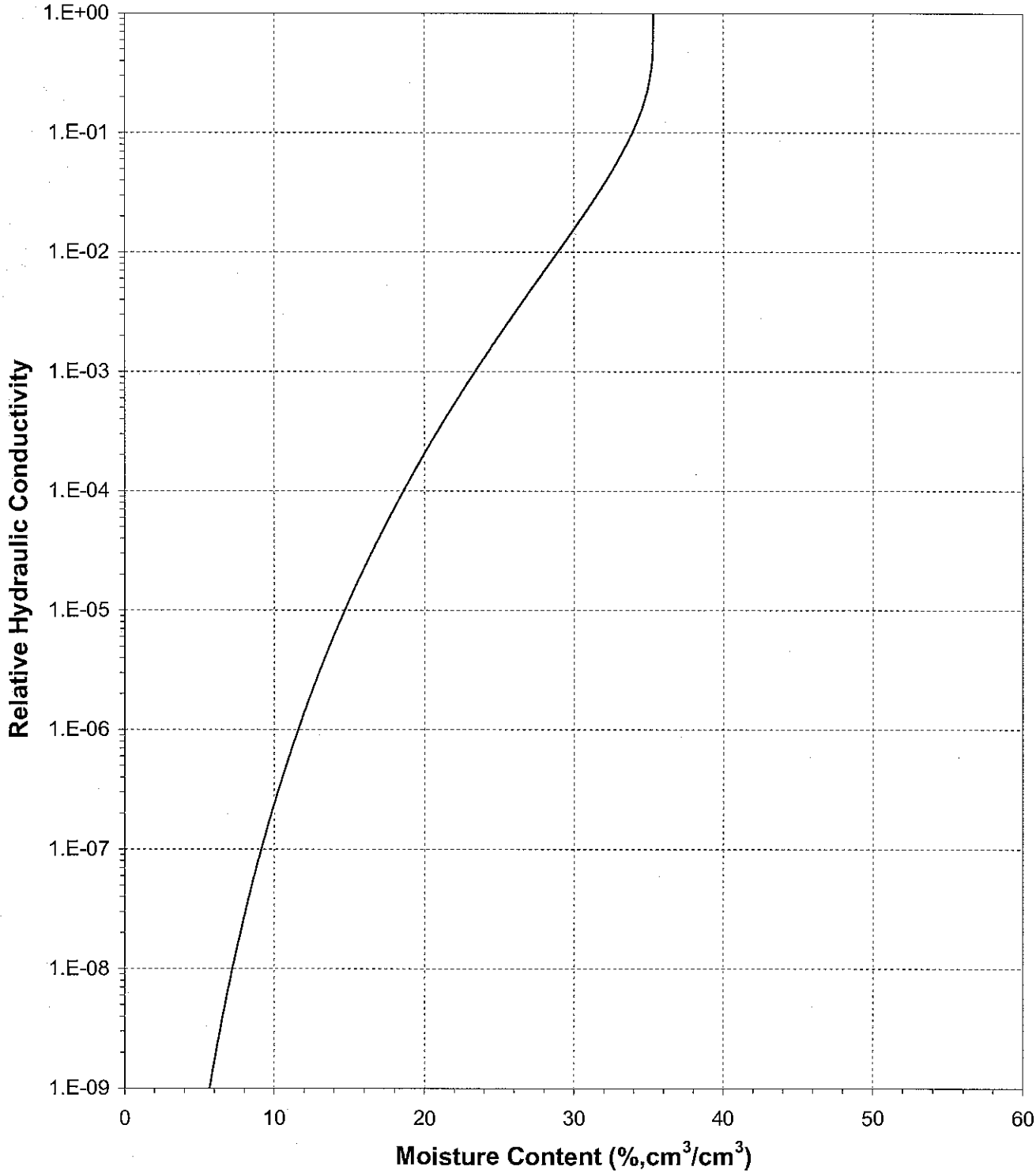
Predicted Water Retention Curve and Data Points

Sample Number: No1-3-1



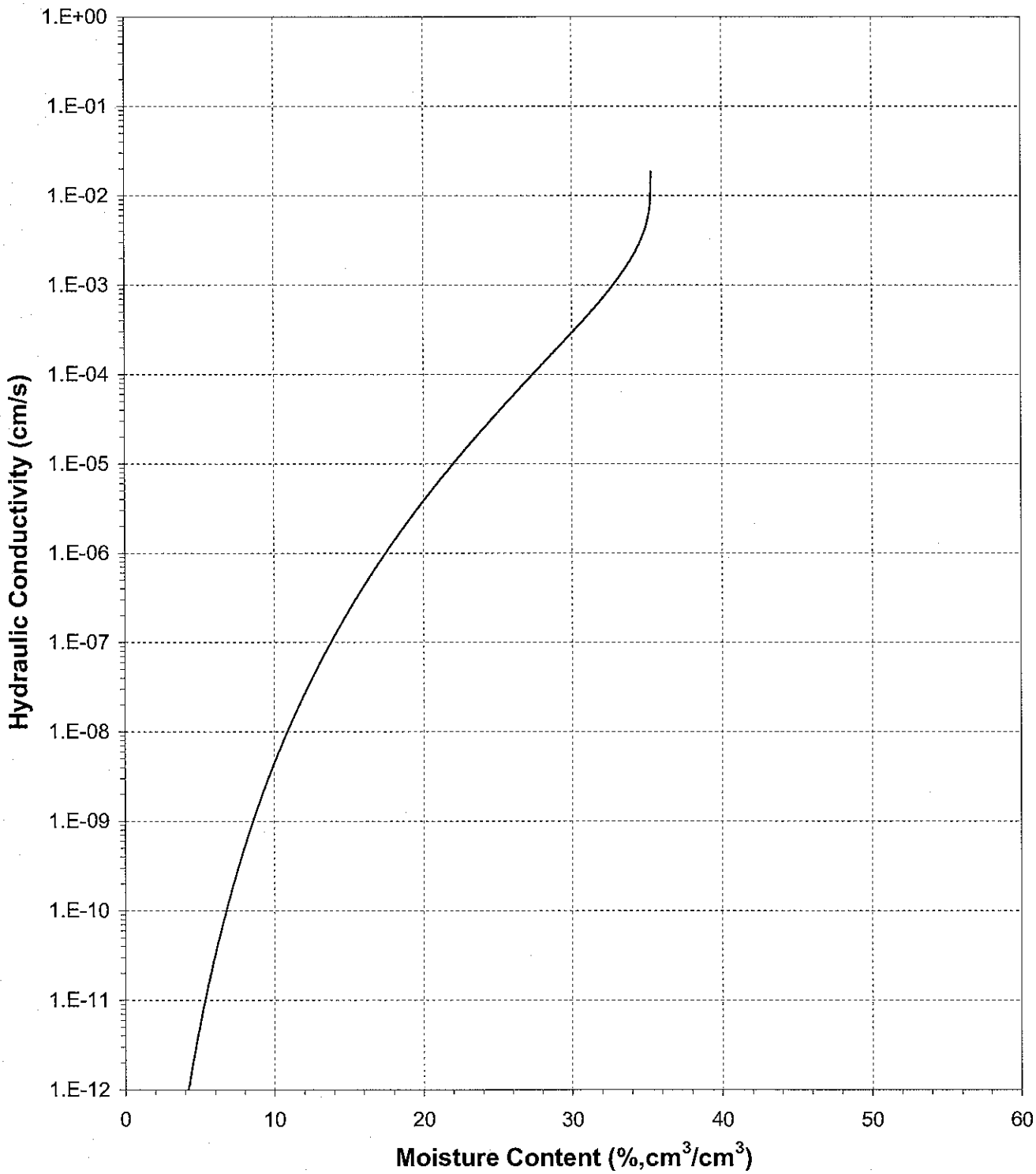
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: No1-3-1



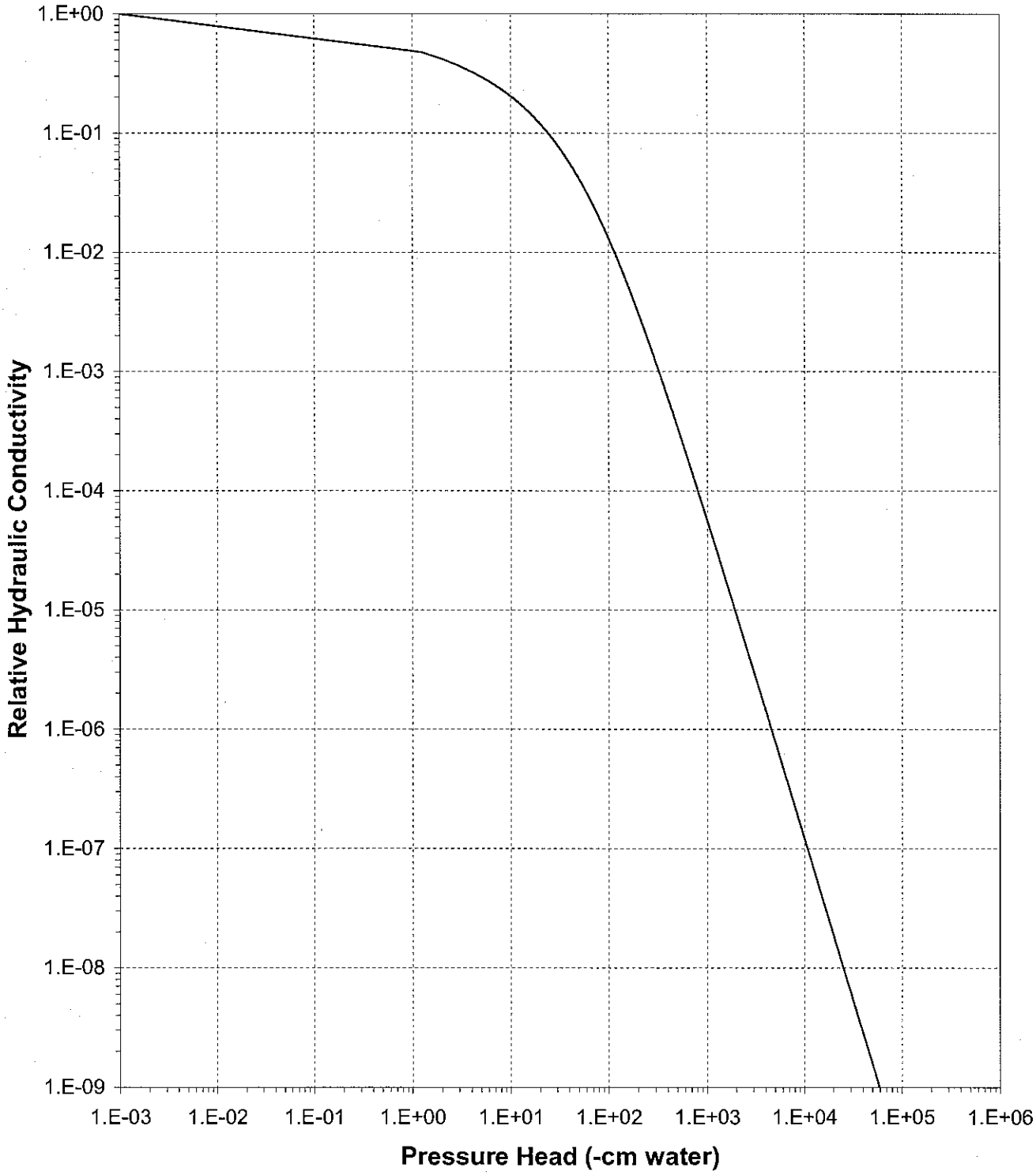
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: No1-3-1



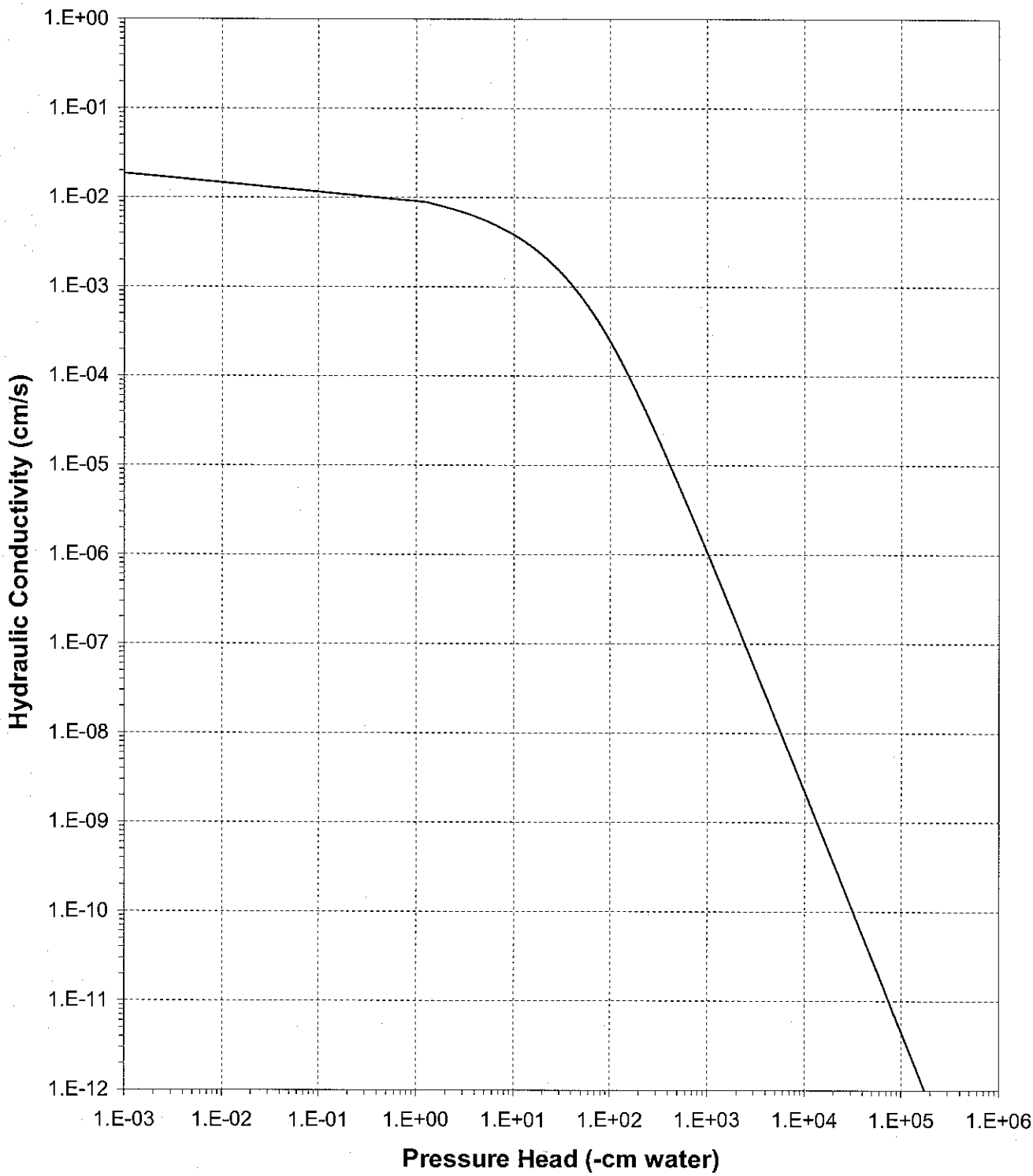
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: No1-3-1



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: No1-3-1



Oversize Correction Data Sheet

Job Name: Golder Associates, Inc.
Job Number: LB06.0155.00
Sample Number: No1-3-1
Ring Number: NA
Depth: NA

Split (3/4", 3/8", #4): #10
Calculated Porosity of Fines (% vol): 47.4

	Coarse Fraction	Fines Fraction	Composite
Subsample Mass (g):	2151.00	1381.00	3532.00
Bulk Density (g/cm^3):	2.64	1.39	1.95
Volume of Solids (cm^3):	814.15	522.71	1336.86
Volume of Voids (cm^3):	0.00	471.05	471.05
Total Volume (cm^3):	814.15	993.75	1807.90
Volumetric Fraction (%):	45.03	54.97	100.00
Initial Moisture Content (% vol):	0.00	22.67	12.46
Saturated Moisture Content (% vol):	0.00	35.31	19.41
Residual Moisture Content (% vol):	0.00	0.00	0.00
Ksat (cm/sec):	NA	1.9E-02	7.3E-03

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
NA = Not analyzed

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines

Moisture Retention Data

Hanging Column/Pressure Plate/Thermocouple

(Main Drainage Curve)

Job Name: Golder Associates, Inc.
Job Number: LB06.0155.00
Sample Number: No1-3-2
Ring Number: NA
Depth: NA

Dry wt. of sample (g): 209.06
Tare wt., ring (g): 66.91
Tare wt., screen & clamp (g): 25.80
Sample volume (cm^3): 150.67

Saturated weight at 0 cm tension* (g): 353.27
Volume of water[†] in saturated sample (cm^3): 51.50
Saturated moisture content (% vol): 34.18
Sample bulk density (g/cm^3): 1.39

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content[†] (% vol)
Hanging column:	10-Aug-06 / 09:20	353.27	0.00	34.18
	16-Aug-06 / 07:38	348.09	5.00	30.74
	23-Aug-06 / 10:27	345.91	9.50	29.30
	29-Aug-06 / 16:01	339.75	76.50	25.21
Pressure plate:	07-Sep-06 / 09:50	330.35	509.90	18.97

Comments:

* Weight including tares
[†] Assumed density of water is 1.0 g/cm^3

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines

Moisture Retention Data

Water Activity Meter/Relative Humidity Box

(Main Drainage Curve)

Job Name: Golder Associates, Inc.
Job Number: LB06.0155.00
Sample Number: No1-3-2
Ring Number: NA
Depth: NA

Dry weight of water activity meter sample* (g): 159.80
Tare weight, jar (g): 112.94
Sample bulk density (g/cm^3): 1.39

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content^T (% vol)
Water Activity Meter:	14-Aug-06 / 13:05	162.61	6934.6	8.32

Dry weight of relative humidity box sample* (g): 76.72
Tare weight (g): 44.85
Sample bulk density (g/cm^3): 1.39

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content^T (% vol)
Relative humidity box:	14-Aug-06 / 14:00	77.17	851293	1.96

Comments:

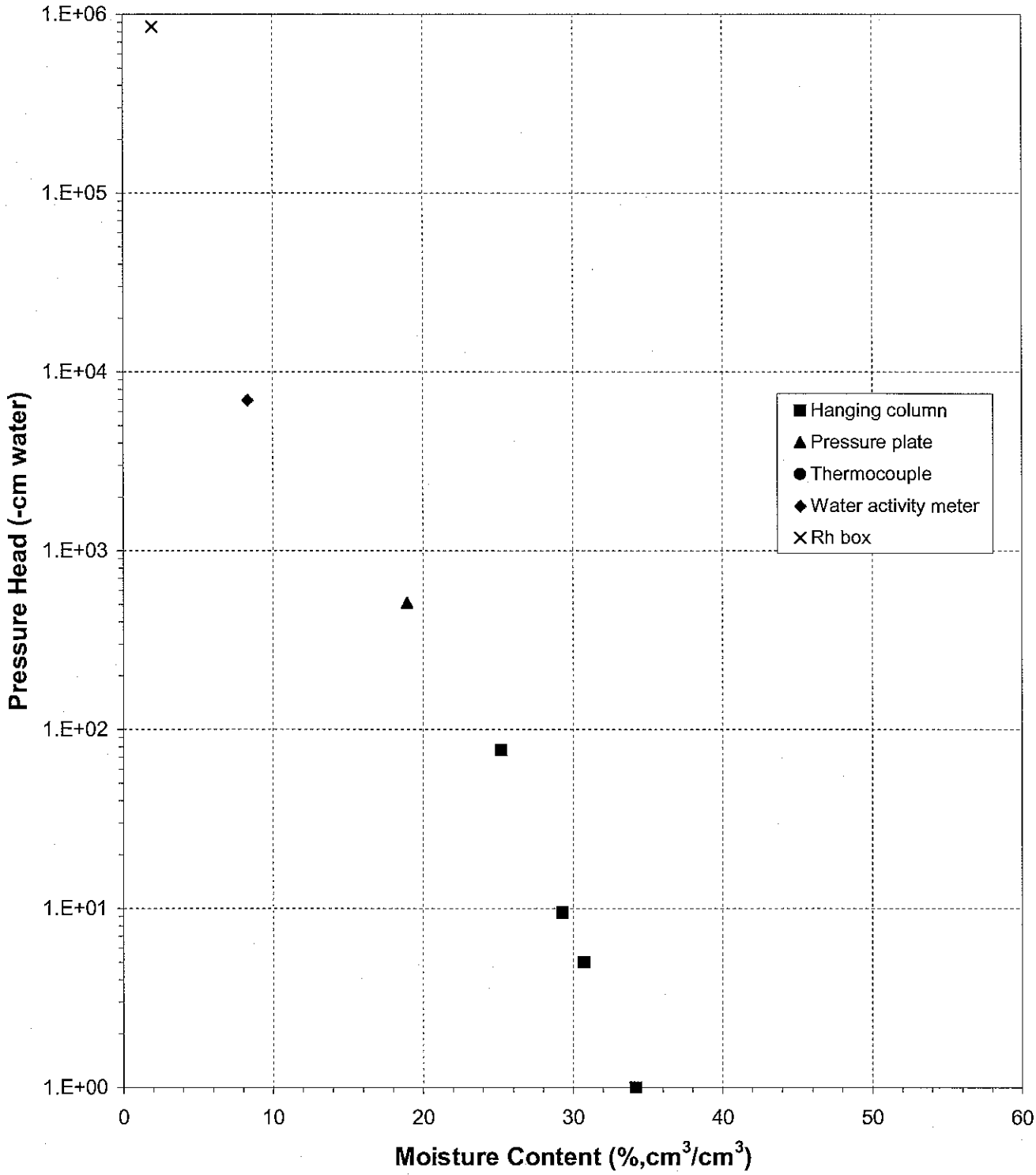
* Weight including tares

† Assumed density of water is 1.0 g/cm^3

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines

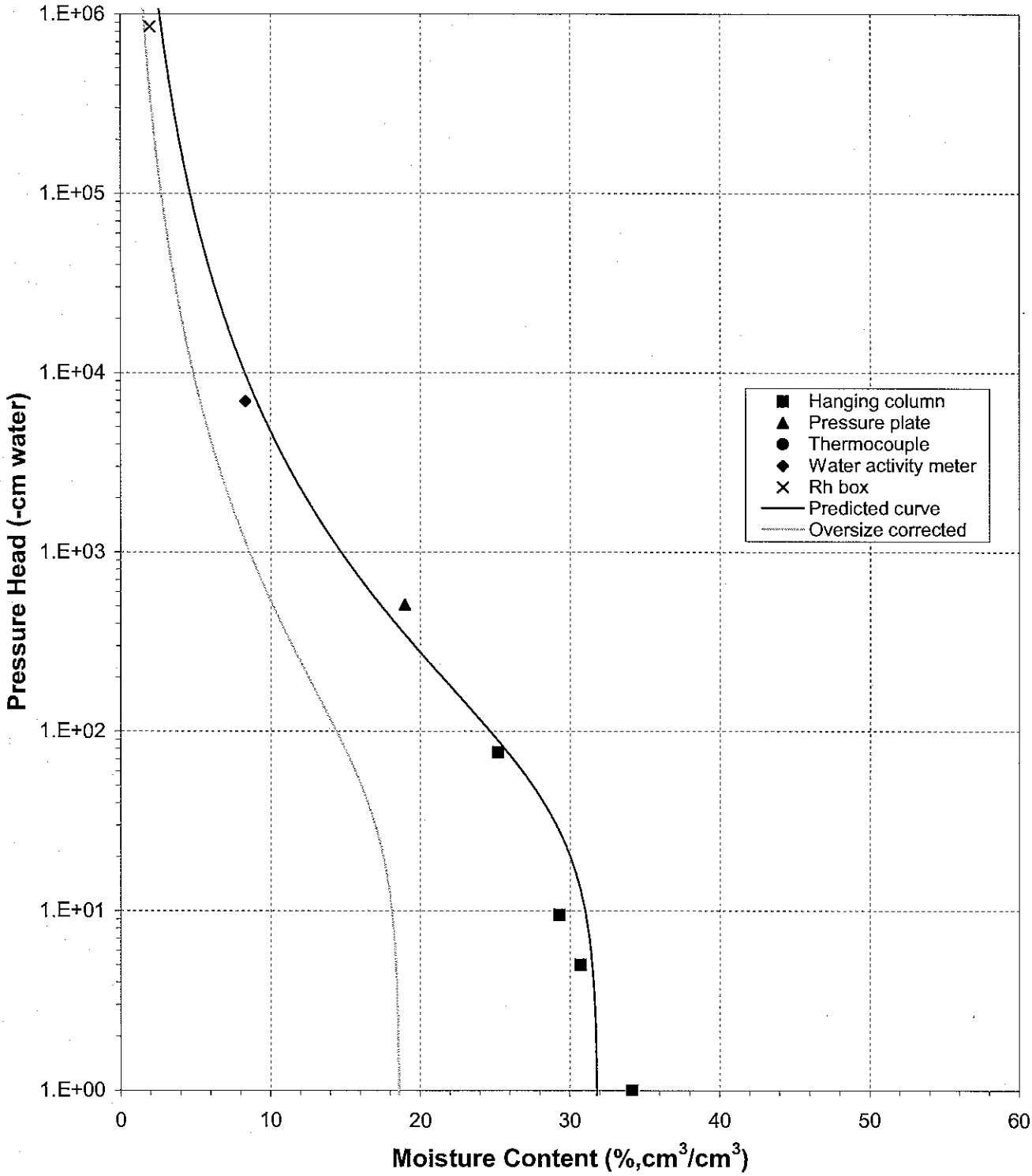
Water Retention Data Points

Sample Number: No1-3-2



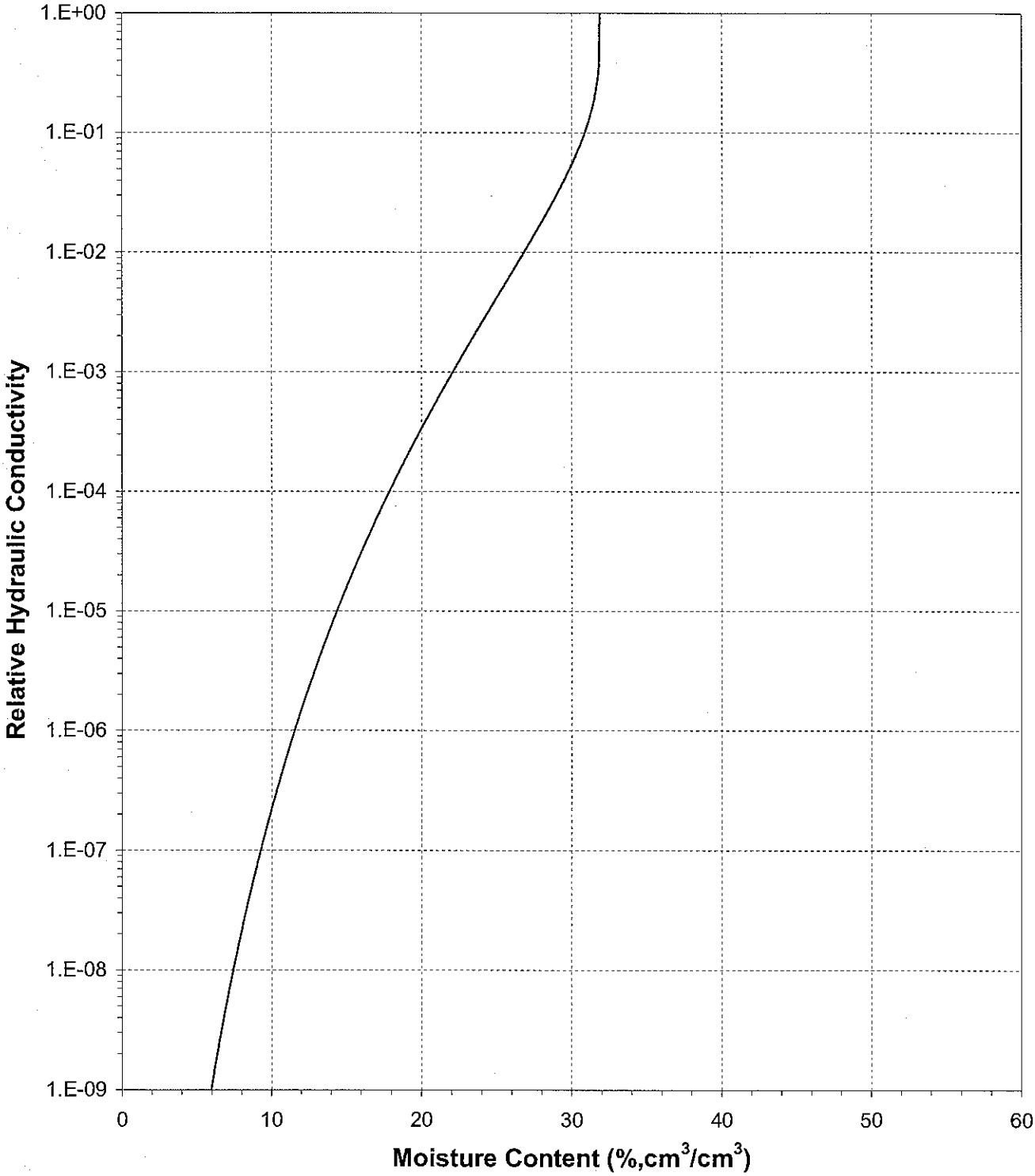
Predicted Water Retention Curve and Data Points

Sample Number: No1-3-2



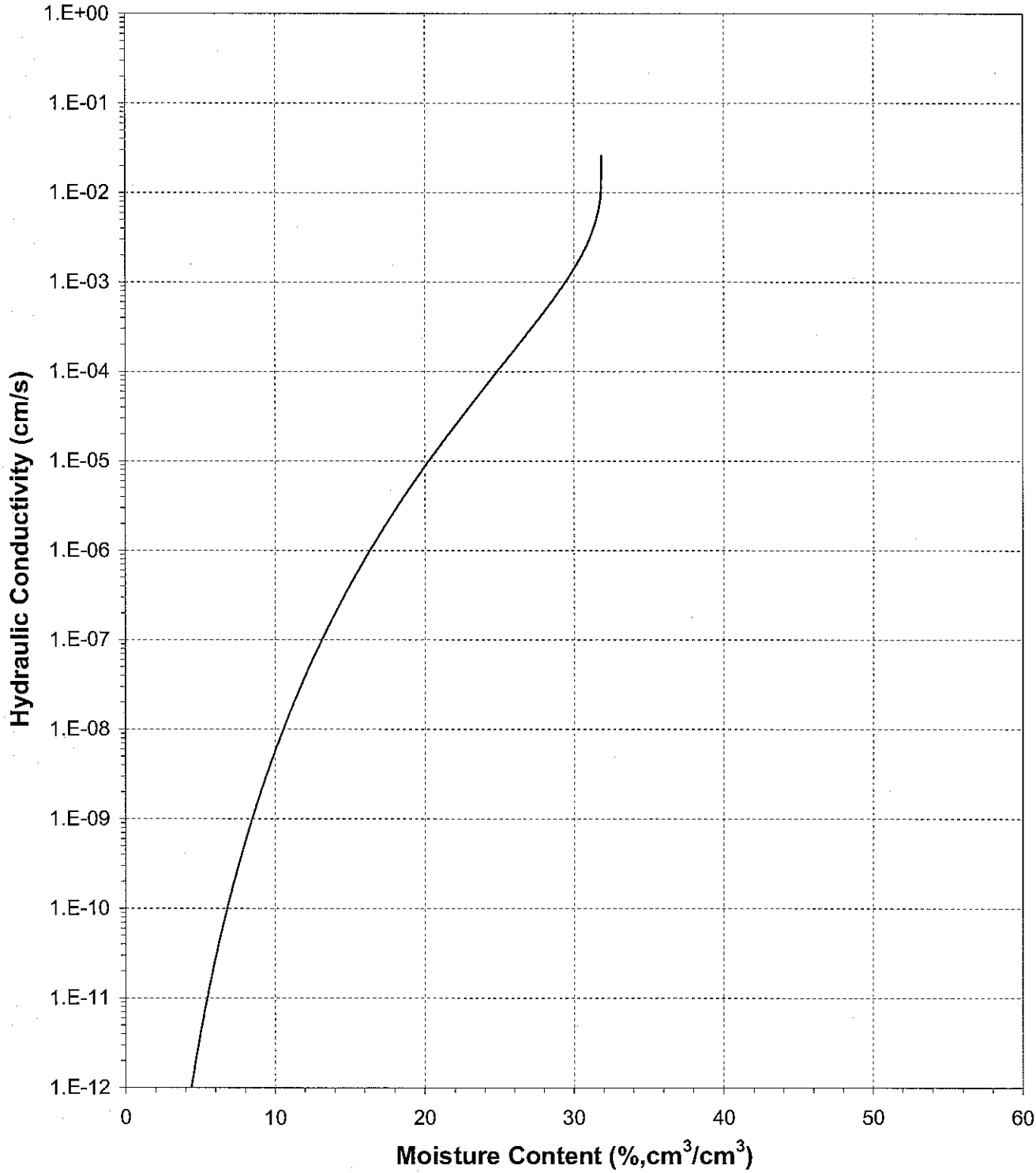
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: No1-3-2



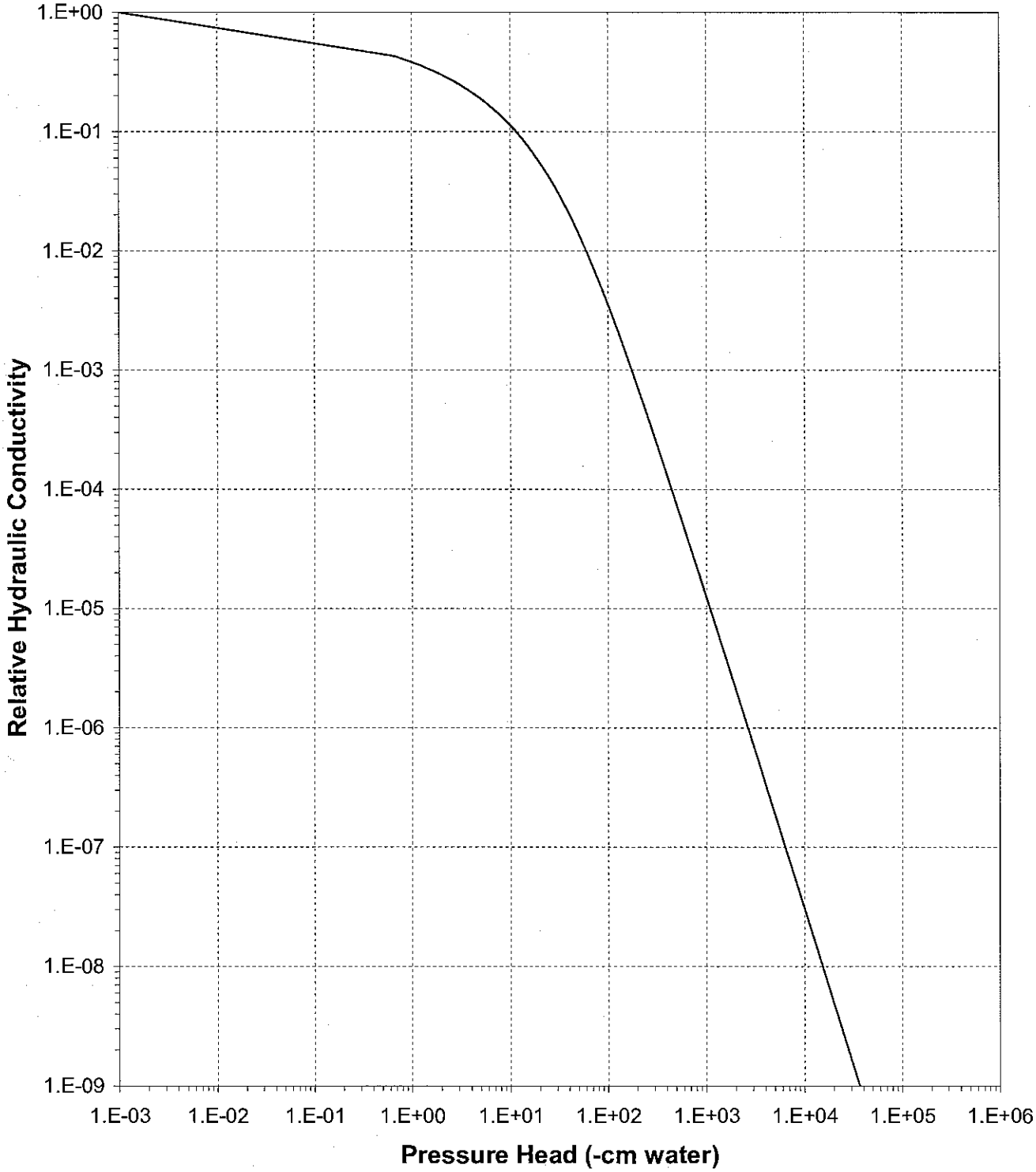
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: No1-3-2



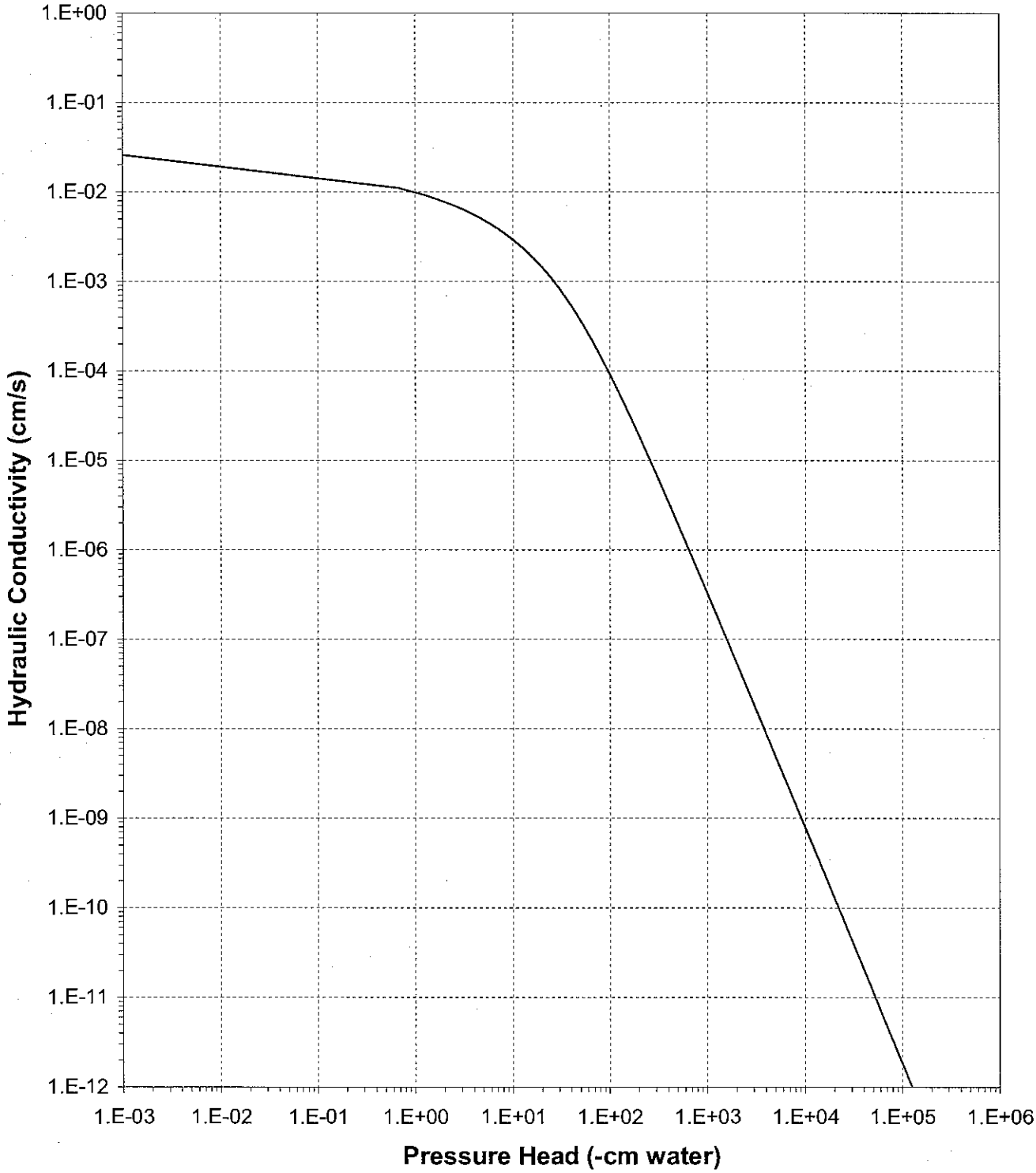
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: No1-3-2



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: No1-3-2



Oversize Correction Data Sheet

Job Name: Golder Associates, Inc.
Job Number: LB06.0155.00
Sample Number: No1-3-2
Ring Number: NA
Depth: NA

Split (3/4", 3/8", #4): #10
Calculated Porosity of Fines (% vol): 47.0

	Coarse Fraction	Fines Fraction	Composite
Subsample Mass (g):	2470.00	1837.00	4307.00
Bulk Density (g/cm^3):	2.62	1.39	1.90
Volume of Solids (cm^3):	943.38	701.61	1644.99
Volume of Voids (cm^3):	0.00	622.34	622.34
Total Volume (cm^3):	943.38	1323.96	2267.34
Volumetric Fraction (%):	41.61	58.39	100.00
Initial Moisture Content (% vol):	0.00	21.88	12.77
Saturated Moisture Content (% vol):	0.00	31.88	18.61
Residual Moisture Content (% vol):	0.00	0.00	0.00
Ksat (cm/sec):	NA	2.6E-02	1.1E-02

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
NA = Not analyzed

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines

Moisture Retention Data

Hanging Column/Pressure Plate/Thermocouple

(Main Drainage Curve)

Job Name: Golder Associates, Inc.
Job Number: LB06.0155.00
Sample Number: No1-8-LY
Ring Number: NA
Depth: NA

Dry wt. of sample (g): 191.33
Tare wt., ring (g): 76.99
Tare wt., screen & clamp (g): 24.99
Sample volume (cm^3): 135.93

Saturated weight at 0 cm tension* (g): 348.16
Volume of water[T] in saturated sample (cm^3): 54.85
Saturated moisture content (% vol): 40.35
Sample bulk density (g/cm^3): 1.41

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content[T] (% vol)
Hanging column:	10-Aug-06 / 10:10	348.16	0.00	40.35
	16-Aug-06 / 07:42	342.02	5.00	35.83
	23-Aug-06 / 10:35	340.13	9.50	34.44
	29-Aug-06 / 16:05	329.31	76.50	26.48
Pressure plate:	07-Sep-06 / 09:49	319.57	509.90	19.32

Comments:

* Weight including tares
[1] Assumed density of water is $1.0\ g/cm^3$

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines

Moisture Retention Data

Water Activity Meter/Relative Humidity Box

(Main Drainage Curve)

Job Name: Golder Associates, Inc.
Job Number: LB06.0155.00
Sample Number: No1-8-LY
Ring Number: NA
Depth: NA

Dry weight of water activity meter sample* (g): 156.53
Tare weight, jar (g): 112.90
Sample bulk density (g/cm^3): 1.41

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Water Activity Meter:	14-Aug-06 / 15:30	159.09	11217.8	8.26

Dry weight of relative humidity box sample* (g): 87.57
Tare weight (g): 42.81
Sample bulk density (g/cm^3): 1.41

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Relative humidity box:	14-Aug-06 / 14:00	88.34	851293	2.42

Comments:

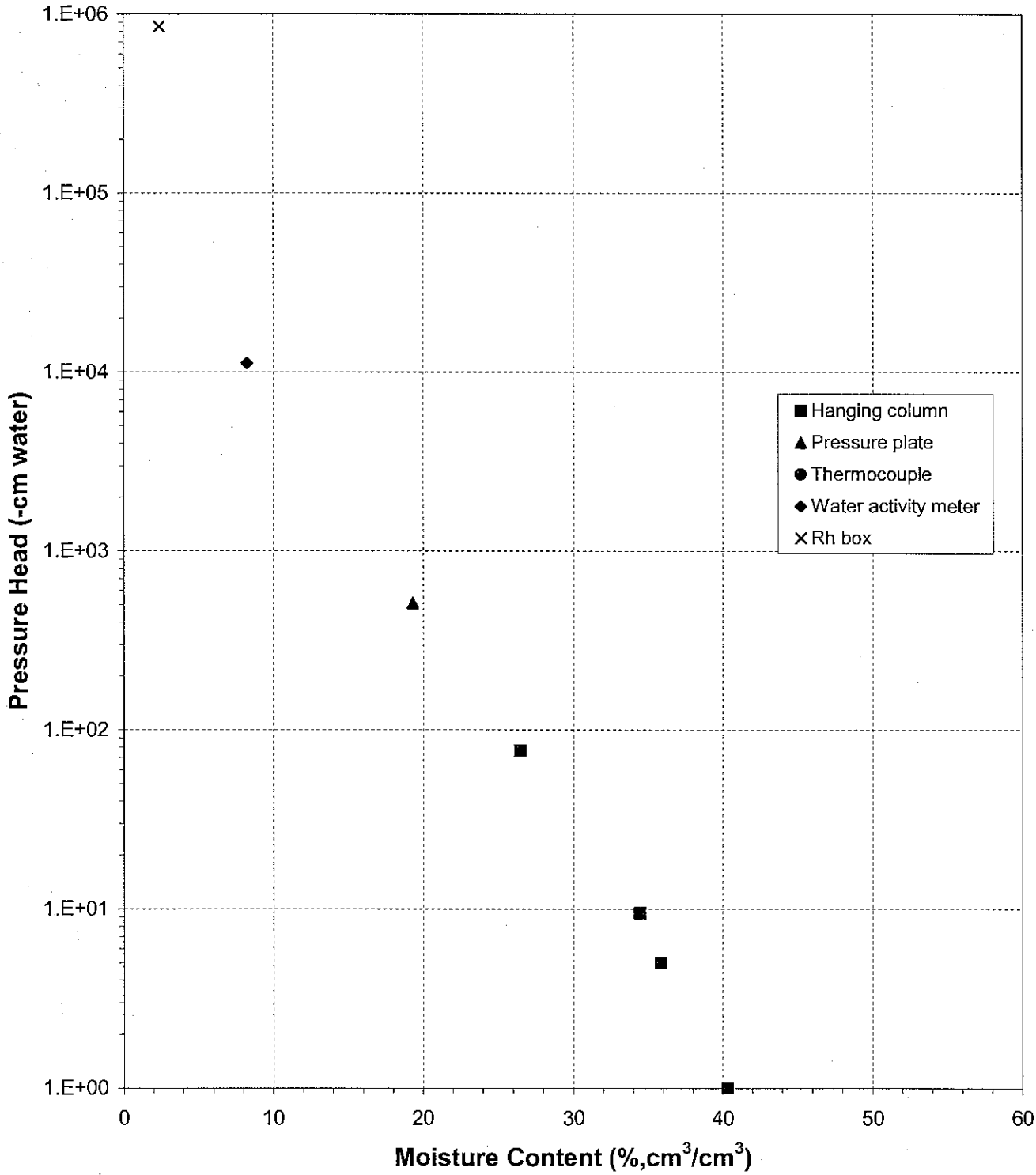
* Weight including tares

† Assumed density of water is 1.0 g/cm^3

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines

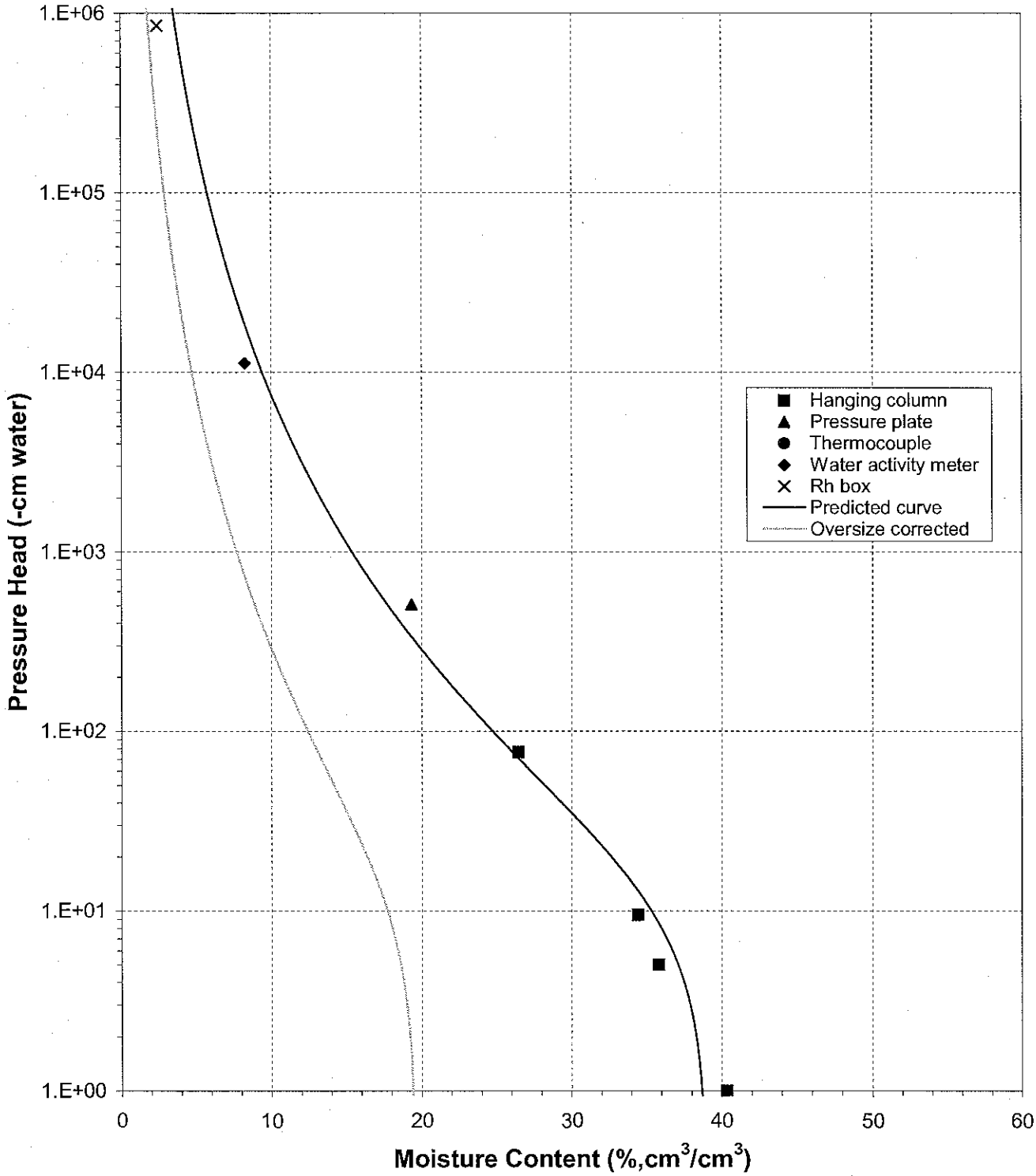
Water Retention Data Points

Sample Number: No1-8-LY



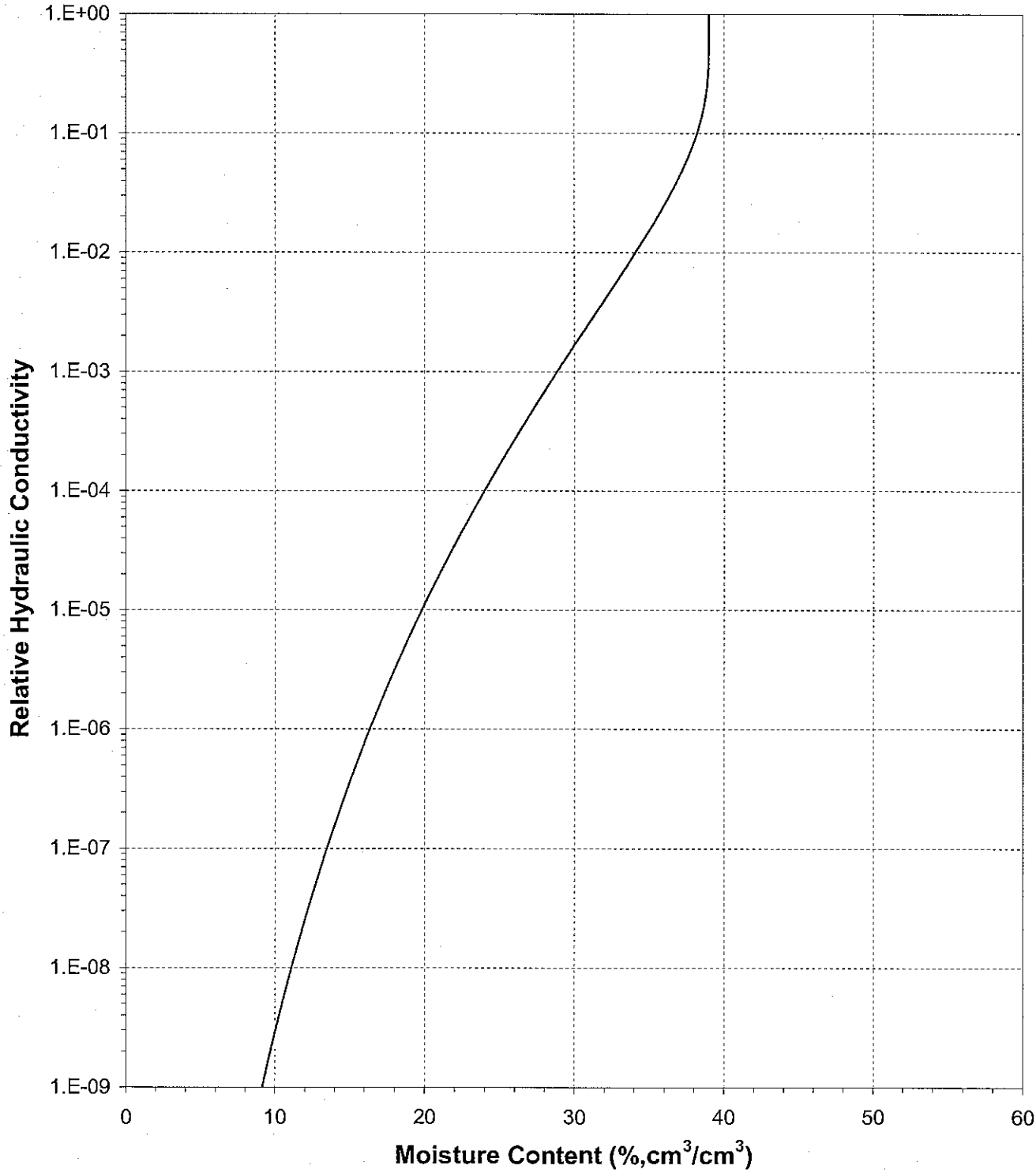
Predicted Water Retention Curve and Data Points

Sample Number: No1-8-LY



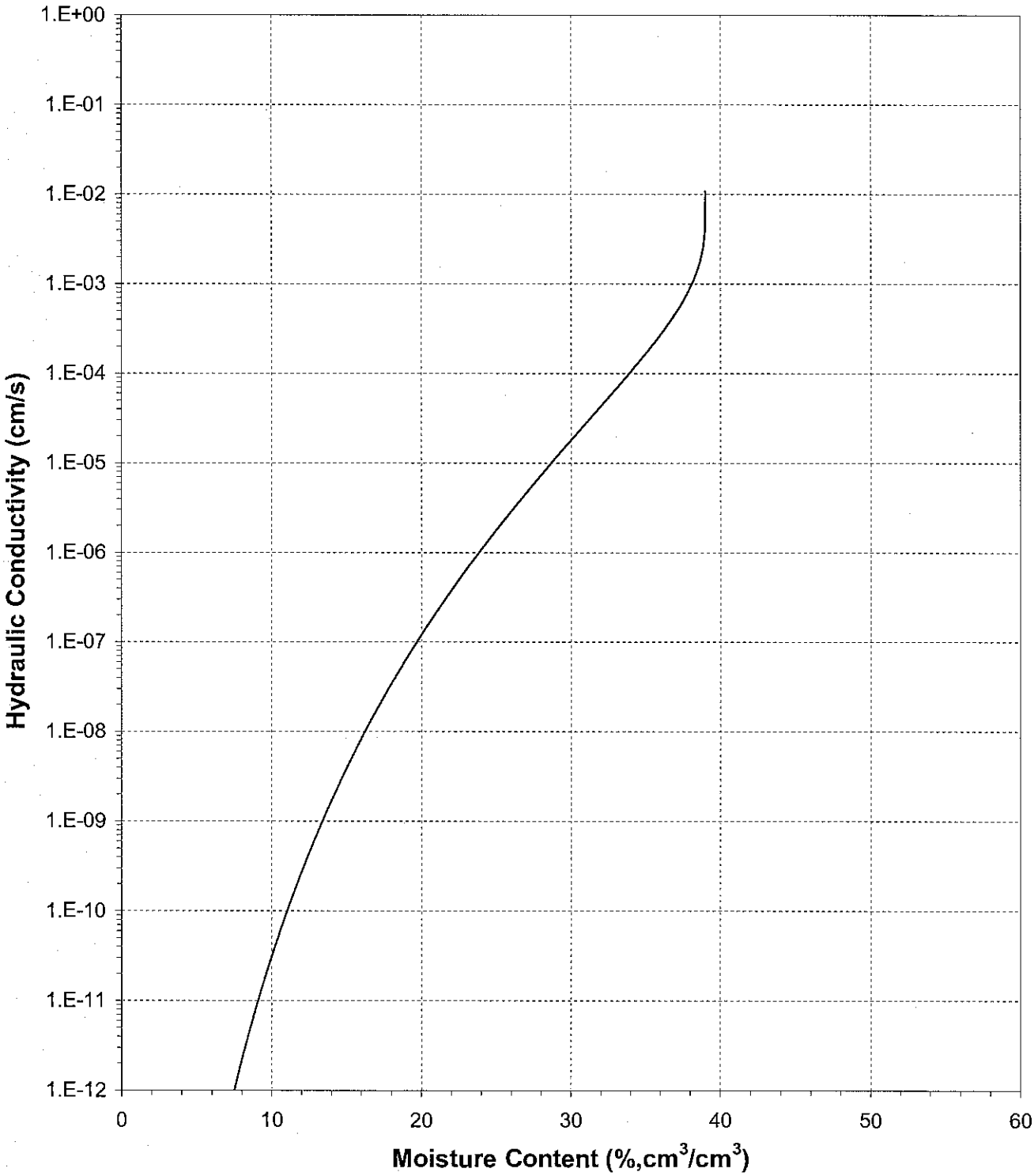
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: No1-8-LY



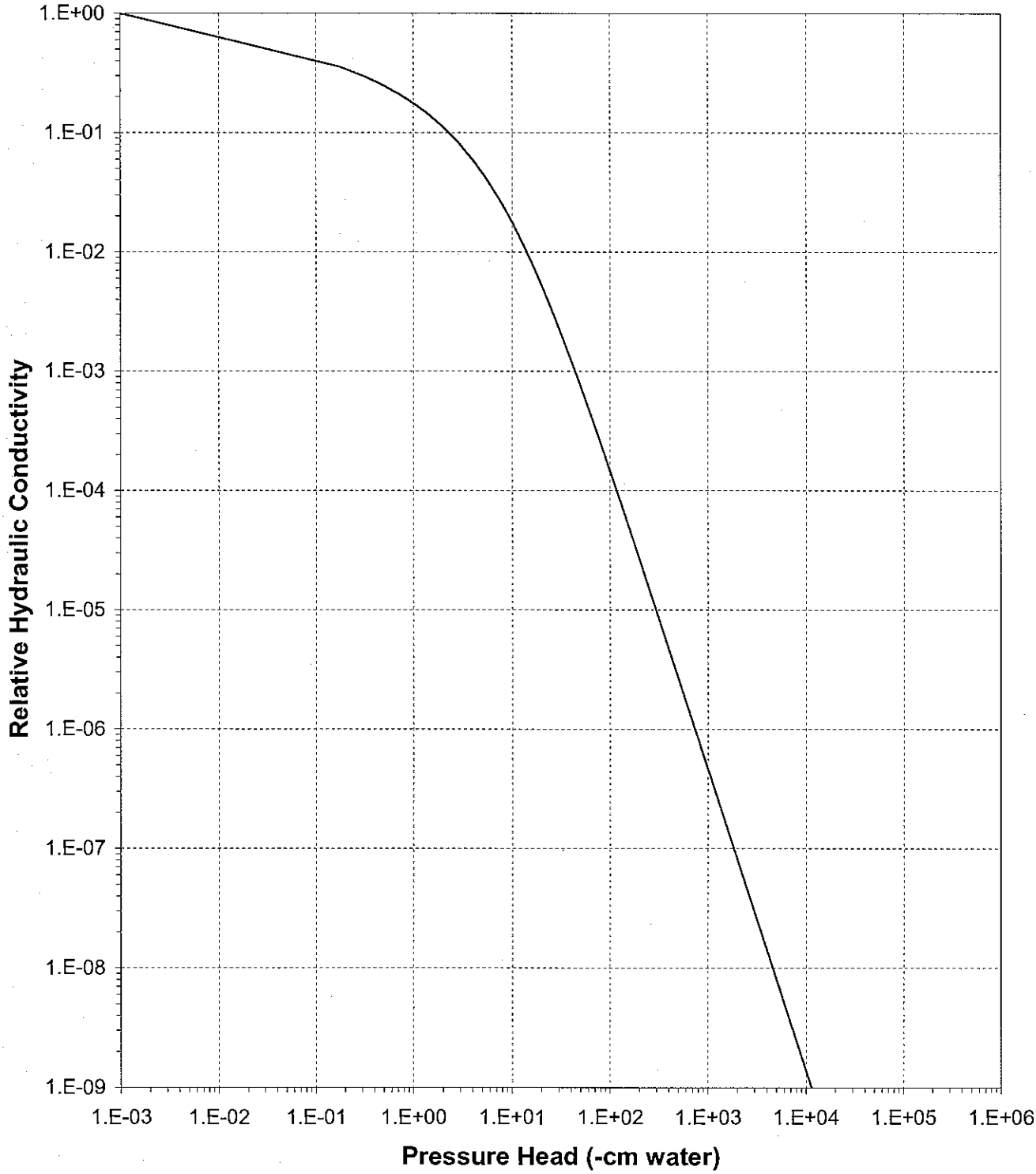
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: No1-8-LY



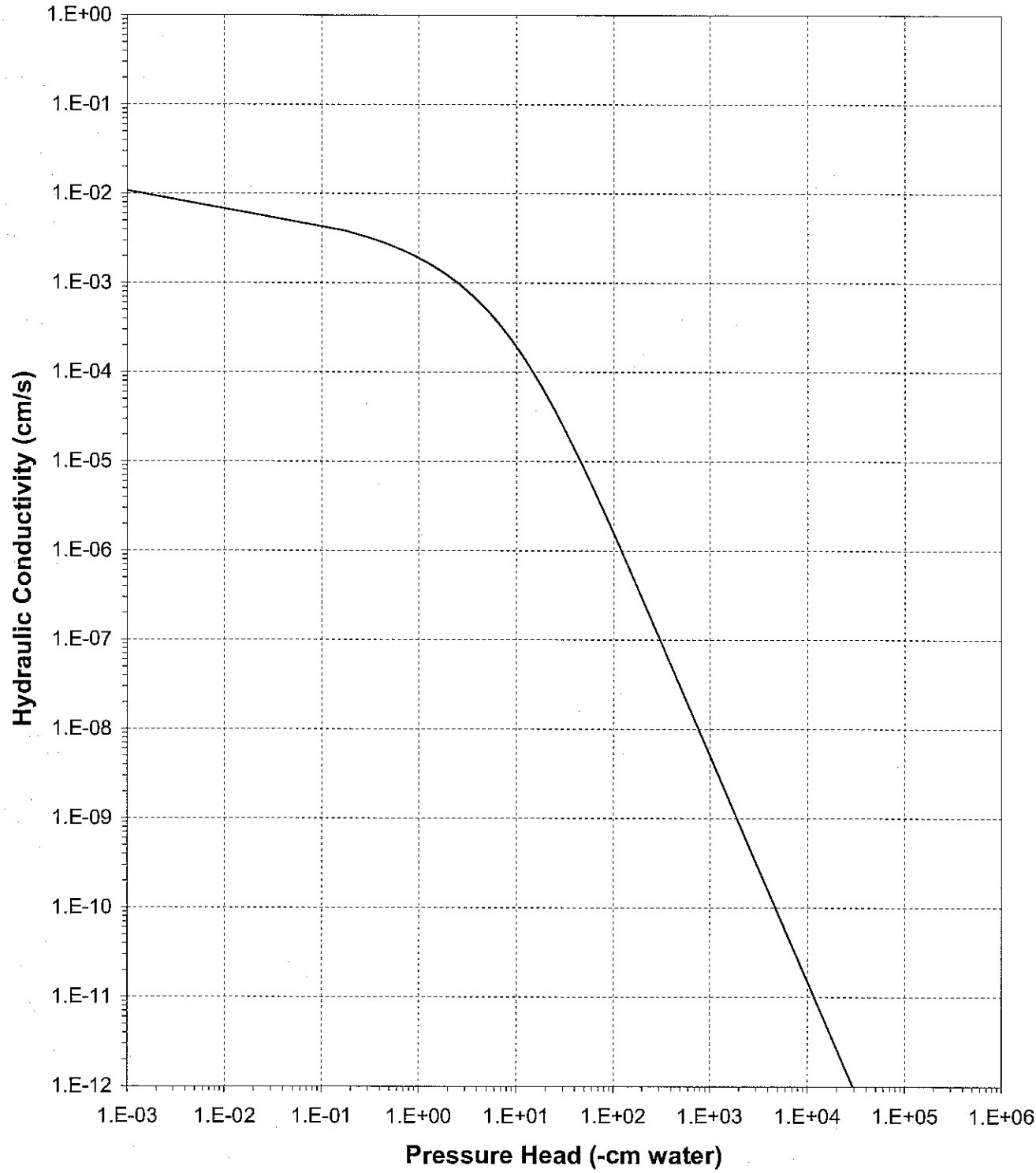
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: No1-8-LY



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: No1-8-LY



Oversize Correction Data Sheet

Job Name: Golder Associates, Inc.
Job Number: LB06.0155.00
Sample Number: No1-8-LY
Ring Number: NA
Depth: NA

Split (3/4", 3/8", #4): #10
Calculated Porosity of Fines (% vol): 45.6

	Coarse Fraction	Fines Fraction	Composite
Subsample Mass (g):	2722.00	1490.00	4212.00
Bulk Density (g/cm^3):	2.59	1.41	2.00
Volume of Solids (cm^3):	1051.36	575.51	1626.87
Volume of Voids (cm^3):	0.00	483.10	483.10
Total Volume (cm^3):	1051.36	1058.60	2109.97
Volumetric Fraction (%):	49.83	50.17	100.00
Initial Moisture Content (% vol):	0.00	22.25	11.16
Saturated Moisture Content (% vol):	0.00	39.00	19.57
Residual Moisture Content (% vol):	0.00	0.00	0.00
Ksat (cm/sec):	NA	1.1E-02	3.8E-03

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
NA = Not analyzed

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines

Particle Density

Summary of Particle Density Tests

Sample Number	Particle Density (g/cm^3)
No1-1-1	2.64
No1-1-2	2.65
No1-2-1	2.62
No1-2-2	2.60
No1-3-1	2.64
No1-3-2	2.62
No1-8-LY	2.59

Particle Density

Job Name: Golder Associates, Inc.
Job Number: LB06.0155.00
Sample Number: No1-1-1
Ring Number: NA
Depth: NA
Test Date: 2-Aug-06

Trial 1

Weight of pycnometer filled w/air (g):	99.30
Weight of pycnometer filled w/soil (g):	150.57
Weight of pycnometer filled w/soil & water (g):	380.25
Weight of pycnometer filled w/water (g):	348.39
Observed temperature (°C):	22.80
Density of water at observed temperature (g/cm^3):	0.9976
Particle Density (g/cm^3):	2.64
Correction factor, K:	0.9994
Particle Density at 20°C (g/cm^3):	2.64

Trial 2

Weight of pycnometer filled w/air (g):	90.94
Weight of pycnometer filled w/soil (g):	143.59
Weight of pycnometer filled w/soil & water (g):	372.76
Weight of pycnometer filled w/water (g):	340.07
Observed temperature (°C):	22.80
Density of water at observed temperature (g/cm^3):	0.9976
Particle Density (g/cm^3):	2.63
Correction factor, K:	0.9994
Particle Density at 20°C (g/cm^3):	2.63

Average Particle Density **(g/cm^3):** **2.64**

Comments:

Laboratory analysis by: C. Krous
Data entered by: C. Krous
Checked by: J. Hines

Particle Density

Job Name: Golder Associates, Inc.
Job Number: LB06.0155.00
Sample Number: No1-1-2
Ring Number: NA
Depth: NA
Test Date: 2-Aug-06

Trial 1

Weight of pycnometer filled w/air (g):	93.34
Weight of pycnometer filled w/soil (g):	144.70
Weight of pycnometer filled w/soil & water (g):	374.33
Weight of pycnometer filled w/water (g):	342.38
Observed temperature (°C):	22.50
Density of water at observed temperature (g/cm^3):	0.9977
Particle Density (g/cm^3):	2.64
Correction factor, K:	0.9995
Particle Density at 20°C (g/cm^3):	2.64

Trial 2

Weight of pycnometer filled w/air (g):	102.02
Weight of pycnometer filled w/soil (g):	151.51
Weight of pycnometer filled w/soil & water (g):	382.12
Weight of pycnometer filled w/water (g):	351.20
Observed temperature (°C):	22.70
Density of water at observed temperature (g/cm^3):	0.9976
Particle Density (g/cm^3):	2.66
Correction factor, K:	0.9994
Particle Density at 20°C (g/cm^3):	2.66

Average Particle Density **(g/cm^3):** **2.65**

Comments:

Laboratory analysis by: C. Krous
Data entered by: C. Krous
Checked by: J. Hines

Particle Density

Job Name: Golder Associates, Inc.
Job Number: LB06.0155.00
Sample Number: No1-2-1
Ring Number: NA
Depth: NA
Test Date: 2-Aug-06

Trial 1

Weight of pycnometer filled w/air (g):	100.36
Weight of pycnometer filled w/soil (g):	153.12
Weight of pycnometer filled w/soil & water (g):	382.17
Weight of pycnometer filled w/water (g):	349.49
Observed temperature (°C):	22.60
Density of water at observed temperature (g/cm^3):	0.9976
Particle Density (g/cm^3):	2.62
Correction factor, K:	0.9994
Particle Density at 20°C (g/cm^3):	2.62

Trial 2

Weight of pycnometer filled w/air (g):	100.07
Weight of pycnometer filled w/soil (g):	151.13
Weight of pycnometer filled w/soil & water (g):	380.80
Weight of pycnometer filled w/water (g):	349.25
Observed temperature (°C):	22.50
Density of water at observed temperature (g/cm^3):	0.9977
Particle Density (g/cm^3):	2.61
Correction factor, K:	0.9995
Particle Density at 20°C (g/cm^3):	2.61

Average Particle Density **(g/cm^3):** **2.62**

Comments:

Laboratory analysis by: C. Krous
Data entered by: C. Krous
Checked by: J. Hines

Particle Density

Job Name: Golder Associates, Inc.
Job Number: LB06.0155.00
Sample Number: No1-2-2
Ring Number: NA
Depth: NA
Test Date: 3-Aug-06

Trial 1

Weight of pycnometer filled w/air (g):	98.67
Weight of pycnometer filled w/soil (g):	149.07
Weight of pycnometer filled w/soil & water (g):	379.44
Weight of pycnometer filled w/water (g):	348.41
Observed temperature (°C):	22.50
Density of water at observed temperature (g/cm^3):	0.9977
Particle Density (g/cm^3):	2.60
Correction factor, K:	0.9995
Particle Density at 20°C (g/cm^3):	2.60

Trial 2

Weight of pycnometer filled w/air (g):	99.91
Weight of pycnometer filled w/soil (g):	150.31
Weight of pycnometer filled w/soil & water (g):	380.05
Weight of pycnometer filled w/water (g):	348.92
Observed temperature (°C):	22.50
Density of water at observed temperature (g/cm^3):	0.9977
Particle Density (g/cm^3):	2.61
Correction factor, K:	0.9995
Particle Density at 20°C (g/cm^3):	2.61

***Average Particle Density* (g/cm^3):** **2.60**

Comments:

Laboratory analysis by: C. Krous
Data entered by: C. Krous
Checked by: J. Hines

Particle Density

Job Name: Golder Associates, Inc.
Job Number: LB06.0155.00
Sample Number: No1-3-1
Ring Number: NA
Depth: NA
Test Date: 2-Aug-06

Trial 1

Weight of pycnometer filled w/air (g):	91.76
Weight of pycnometer filled w/soil (g):	142.06
Weight of pycnometer filled w/soil & water (g):	372.12
Weight of pycnometer filled w/water (g):	340.87
Observed temperature (°C):	22.40
Density of water at observed temperature (g/cm^3):	0.9977
Particle Density (g/cm^3):	2.63
Correction factor, K:	0.9995
Particle Density at 20°C (g/cm^3):	2.64

Trial 2

Weight of pycnometer filled w/air (g):	91.45
Weight of pycnometer filled w/soil (g):	145.96
Weight of pycnometer filled w/soil & water (g):	374.36
Weight of pycnometer filled w/water (g):	340.40
Observed temperature (°C):	22.60
Density of water at observed temperature (g/cm^3):	0.9976
Particle Density (g/cm^3):	2.65
Correction factor, K:	0.9994
Particle Density at 20°C (g/cm^3):	2.65

Average Particle Density **(g/cm^3):** **2.64**

Comments:

Laboratory analysis by: C. Krous
Data entered by: C. Krous
Checked by: J. Hines

Particle Density

Job Name: Golder Associates, Inc.
Job Number: LB06.0155.00
Sample Number: No1-3-2
Ring Number: NA
Depth: NA
Test Date: 3-Aug-06

Trial 1

Weight of pycnometer filled w/air (g):	90.81
Weight of pycnometer filled w/soil (g):	142.48
Weight of pycnometer filled w/soil & water (g):	371.73
Weight of pycnometer filled w/water (g):	339.85
Observed temperature (°C):	22.40
Density of water at observed temperature (g/cm^3):	0.9977
Particle Density (g/cm^3):	2.60
Correction factor, K:	0.9995
Particle Density at 20°C (g/cm^3):	2.61

Trial 2

Weight of pycnometer filled w/air (g):	91.23
Weight of pycnometer filled w/soil (g):	141.84
Weight of pycnometer filled w/soil & water (g):	371.63
Weight of pycnometer filled w/water (g):	340.23
Observed temperature (°C):	22.50
Density of water at observed temperature (g/cm^3):	0.9977
Particle Density (g/cm^3):	2.63
Correction factor, K:	0.9995
Particle Density at 20°C (g/cm^3):	2.63

Average Particle Density **(g/cm^3):** **2.62**

Comments:

Laboratory analysis by: C. Krous
Data entered by: C. Krous
Checked by: J. Hines

Particle Density

Job Name: Golder Associates, Inc.
Job Number: LB06.0155.00
Sample Number: No1-8-LY
Ring Number: NA
Depth: NA
Test Date: 3-Aug-06

Trial 1

Weight of pycnometer filled w/air (g):	92.48
Weight of pycnometer filled w/soil (g):	142.56
Weight of pycnometer filled w/soil & water (g):	372.33
Weight of pycnometer filled w/water (g):	341.54
Observed temperature (°C):	23.10
Density of water at observed temperature (g/cm^3):	0.9975
Particle Density (g/cm^3):	2.59
Correction factor, K:	0.9993
Particle Density at 20°C (g/cm^3):	2.59

Trial 2

Weight of pycnometer filled w/air (g):	90.97
Weight of pycnometer filled w/soil (g):	141.11
Weight of pycnometer filled w/soil & water (g):	370.97
Weight of pycnometer filled w/water (g):	340.19
Observed temperature (°C):	22.50
Density of water at observed temperature (g/cm^3):	0.9977
Particle Density (g/cm^3):	2.58
Correction factor, K:	0.9995
Particle Density at 20°C (g/cm^3):	2.59

Average Particle Density **(g/cm^3):** **2.59**

Comments:

Laboratory analysis by: C. Krous
Data entered by: C. Krous
Checked by: J. Hines

Laboratory Tests and Methods

Tests and Methods

Dry Bulk Density:	ASTM D4531; ASTM D6836
Moisture Content:	ASTM D2216; ASTM D6836
Calculated Porosity:	ASTM D2435; Klute, A. 1986. Porosity. Chp.18-2.1, pp. 444-445, in A. Klute (ed.), Methods of Soil Analysis, American Society of Agronomy, Madison, WI
Saturated K:	
Constant Head: (Rigid Wall)	ASTM D 2434 (modified apparatus)
Hanging Column Method:	ASTM D6836; Klute, A. 1986. Porosity. Chp.26, in A. Klute (ed.), Methods of Soil Analysis, American Society of Agronomy, Madison, WI
Pressure Plate Method:	ASTM D6836; ASTM D2325
Water Potential Method:	ASTM D6836; Rawlins, S.L. and G.S. Campbell, 1986. Water Potential: Thermocouple Psychrometry. Chp. 24, pp. 597-619, in A. Klute (ed.), Methods of Soil Analysis, Part 1. American Society of Agronomy, Madison, WI.
Relative Humidity Box:	Karathanasis & Hajek. 1982. Quantitative Evaluation of Water Adsorption on Soil Clays.SSA Journal 46:1321-1325
Calc. Kunsat:	ASTM D6836; van Genuchten, M.T. 1980. A closed-form equation for predicting the hydraulic conductivity of unsaturated soils. SSSAJ 44:892-898; van Genuchten, M.T., F.J. Leij, and S.R. Yates. 1991. The RETC code for quantifying the hydraulic functions of unsaturated soils. Robert S. Kerr Environmental Research Laboratory, Office of Research and Development, U.S. Environmental Protection Agency, Ada, Oklahoma. EPA/600/2091/065. December 1991
Particle Density (Fine)	ASTM D854
Course Fraction (Gravel) Correction (calc):	ASTM D4718; Bouwer, H. and Rice, R.C. 1984. Hydraulic Properties of Stony Vadose Zones. Groundwater Vol. 22, No. 6

APPENDIX D

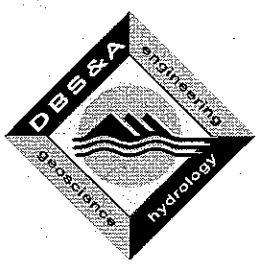
SOIL HYDRAULIC LABORATORY DATA
STOCKPILE MATERIALS

Laboratory Report for

Golder Associates, Inc.

(Project # 053-2377)

August 4, 2005



Daniel B. Stephens & Associates, Inc.

6020 Academy NE, Suite 100 • Albuquerque, New Mexico 87109

August 4, 2005

Todd Stein & Lewis Munk
Golder Associates, Inc.
4910 Alameda Blvd. NE, Suite A
Albuquerque, NM 87113
(505)-821-3043

Re: Laboratory Report for Golder Associates, Inc. (053-2377)

Dear Mr. Stein and Mr. Munk:

Enclosed is the final report for the Golder Associates, Inc. samples (053-2377). Please review this report and provide any comments as samples will be held for a maximum of 30 days. After 30 days samples will be returned or disposed of in an appropriate manner.

All testing results were evaluated subjectively for consistency and reasonableness, and the results appear to be reasonably representative of the material tested. However, DBS&A does not assume any responsibility for interpretations or analyses based on the data enclosed, nor can we guarantee that these data are fully representative of the undisturbed materials at the field site. We recommend that careful evaluation of these laboratory results be made for your particular application.

The testing utilized to generate the enclosed final report employs methods that are standard for the industry. The results do not constitute a professional opinion by DBS&A, nor can the results affect any professional or expert opinions rendered with respect thereto by DBS&A. You have acknowledged that all the testing undertaken by us, and the final report provided, constitutes mere test results using standardized methods, and cannot be used to disqualify DBS&A from rendering any professional or expert opinion, having waived any claim of conflict of interest by DBS&A.

We are pleased to provide this service to Golder Associates, Inc. and look forward to future laboratory testing on other projects. If you have any questions about the enclosed data, please do not hesitate to call.

Sincerely,

DANIEL B. STEPHENS & ASSOCIATES, INC.
LABORATORY / TESTING FACILITY

Joleen Hines/ms

Joleen Hines
Laboratory Supervising Manager

Enclosure

Daniel B. Stephens & Associates, Inc.
6020 Academy NE, Suite 100 505-822-9400
Albuquerque, NM 87109 FAX 505-822-8877

Summaries

Summary of Tests Performed

Laboratory Sample Number	Initial Soil Properties[1] (θ, ρ_d, ϕ)	Saturated Hydraulic Conductivity[2]		Moisture Characteristics[3]					Unsaturated Hydraulic Conductivity	Particle Size[4]			Effective Porosity	Particle Density	% Sand, Silt & Clay	Atterberg Limits	Proctor Compaction
		CH	FH	HC	PP	TH	WP	RH		DS	WS	H					
Test Plot 1B (0-2')	X	X		X	X		X	X	X					X	X		
Test Plot 1B (2-3')	X	X		X	X		X	X	X					X	X		
Test Plot 1B (4-5')	X	X		X	X		X	X	X					X	X		
Test Plot 3C (0-2')	X	X		X	X		X	X	X					X	X		
Test Plot 3C (2-3')	X	X		X	X		X	X	X					X	X		
Test Plot 5A (3-4')	X	X		X	X		X	X	X					X	X		
Test Plot 7A (0-2')	X	X		X	X		X	X	X					X	X		
Test Plot 10A (6-7')	X	X		X	X		X	X	X					X	X		

[1] θ = Initial moisture content, ρ = Dry bulk density, ϕ = Calculated porosity

[2] CH = Constant head, FH = falling head

[3] HC = Hanging column, PP = Pressure plate, TH = Thermocouple psychrometer, WP = Water activity meter, RH = Relative humidity box

[4] DS = Dry sieve, WS = Wet sieve, H = Hydrometer

Summary of Initial Moisture Content*, Dry Bulk Density*, Wet Bulk Density, and Calculated Porosity

Sample Number	Initial Moisture Content		Dry Bulk Density	Wet Bulk Density	Calculated Porosity
	Gravimetric (%, g/g)	Volumetric (%, cm^3/cm^3)	(g/cm^3)	(g/cm^3)	(%)
Test Plot 1B (0-2')	12.3	17.2	1.40	1.57	47.6
Test Plot 1B (2-3')	12.7	17.8	1.39	1.57	46.0
Test Plot 1B (4-5')	13.2	18.3	1.39	1.57	46.3
Test Plot 3C (0-2')	11.1	15.4	1.39	1.54	47.9
Test Plot 3C (2-3')	13.2	18.3	1.38	1.57	46.9
Test Plot 5A (3-4')	12.1	16.9	1.40	1.57	46.0
Test Plot 7A (0-2')	12.1	16.9	1.40	1.57	47.0
Test Plot 10A (6-7')	11.3	15.9	1.41	1.57	46.6

*Samples were remolded to between 1.35 and 1.55 g/cm^3 (or 1.4 g/cm^3) at as received moisture content per instructions from Lewis Munk

NA = Not analyzed

Summary of Saturated Hydraulic Conductivity Tests

Sample Number	K_{sat} (cm/sec)	Method of Analysis	
		Constant Head	Falling Head
Test Plot 1B (0-2')	1.6E-03	X	
Test Plot 1B (2-3')	1.9E-03	X	
Test Plot 1B (4-5')	7.9E-04	X	
Test Plot 3C (0-2')	1.6E-03	X	
Test Plot 3C (2-3')	2.5E-03	X	
Test Plot 5A (3-4')	2.7E-04	X	
Test Plot 7A (0-2')	1.9E-04	X	
Test Plot 10A (6-7')	2.0E-04	X	

Summary of Moisture Characteristics of the Initial Drainage Curve

Sample Number	Pressure Head (-cm water)	Moisture Content (%, cm^3/cm^3)
Test Plot 1B (0-2')	0	46.9
	17	37.3
	52	32.6
	88	31.2
	510	25.8
	17541	15.9
	851293	2.9
Test Plot 1B (2-3')	0	51.3
	17	39.2
	52	33.8
	88	32.2
	510	26.2
	14277	13.0
	851293	3.2
Test Plot 1B (4-5')	0	46.9
	22	36.6
	51	34.0
	124	31.3
	510	26.3
	17439	13.9
	851293	3.4
Test Plot 3C (0-2')	0	48.7
	11	45.4
	31	35.8
	77	31.4
	510	24.8
	15093	15.8
	851293	3.4

Summary of Moisture Characteristics of the Initial Drainage Curve (Continued)

Sample Number	Pressure Head (-cm water)	Moisture Content (%, cm^3/cm^3)
Test Plot 3C (2-3')	0	49.8
	9	44.2
	31	36.1
	76	32.2
	510	25.5
	16521	13.2
	851293	3.4
Test Plot 5A (3-4')	0	46.2
	22	38.7
	51	34.2
	124	30.7
	510	25.7
	16521	11.9
	851293	2.9
Test Plot 7A (0-2')	0	45.6
	22	40.1
	51	35.2
	124	31.2
	510	26.6
	9076	14.3
	851293	3.1
Test Plot 10A (6-7')	0	43.1
	25	36.4
	52	32.0
	144	27.9
	510	24.5
	17031	12.5
	851293	2.6

Summary of Calculated Unsaturated Hydraulic Properties

Sample Number	α (cm^{-1})	**N** (dimensionless)	θ_r	θ_s
Test Plot 1B (0-2')	0.1509	1.1564	0.0000	0.4655
Test Plot 1B (2-3')	0.1731	1.1751	0.0000	0.5106
Test Plot 1B (4-5')	0.1006	1.1683	0.0000	0.4642
Test Plot 3C (0-2')	0.1266	1.1746	0.0000	0.4924
Test Plot 3C (2-3')	0.1369	1.1787	0.0000	0.4974
Test Plot 5A (3-4')	0.0605	1.1964	0.0000	0.4576
Test Plot 7A (0-2')	0.0455	1.1974	0.0000	0.4523
Test Plot 10A (6-7')	0.0628	1.1877	0.0000	0.4288

Summary of Calculated Unsaturated Hydraulic Properties with Gravel Corrections

Sample Number	**Ksat**	α (cm^{-1})	**N** (dimensionless)	θ_i	θ_r	θ_s
Test Plot 1B (0-2')	7.3E-04	0.1509	1.1564	0.0780	0.0000	0.2111
Test Plot 1B (2-3')	8.5E-04	0.1731	1.1751	0.0800	0.0000	0.2296
Test Plot 1B (4-5')	5.1E-04	0.1006	1.1683	0.1186	0.0000	0.3008
Test Plot 3C (0-2')	8.4E-04	0.1266	1.1746	0.0809	0.0000	0.2587
Test Plot 3C (2-3')	1.4E-03	0.1369	1.1787	0.1017	0.0000	0.2764
Test Plot 5A (3-4')	1.6E-04	0.0605	1.1964	0.0998	0.0000	0.2702
Test Plot 7A (0-2')	7.1E-05	0.0455	1.1974	0.0629	0.0000	0.1683
Test Plot 10A (6-7')	8.5E-05	0.0628	1.1877	0.0672	0.0000	0.1811

Summary of Particle Density Tests

Sample Number	Particle Density (g/cm^3)
Test Plot 1B (0-2')	2.67
Test Plot 1B (2-3')	2.58
Test Plot 1B (4-5')	2.58
Test Plot 3C (0-2')	2.66
Test Plot 3C (2-3')	2.61
Test Plot 5A (3-4')	2.59
Test Plot 7A (0-2')	2.64
Test Plot 10A (6-7')	2.64

Summary of Percent Sand, Silt & Clay Tests

Sample Number	% Sand	% Silt	% Clay
Test Plot 1B (0-2')	56.2	25.4	18.4
Test Plot 1B (2-3')	57.2	24.4	18.4
Test Plot 1B (4-5')	58.0	24.0	18.0
Test Plot 3C (0-2')	60.0	22.7	17.3
Test Plot 3C (2-3')	60.3	22.8	16.9
Test Plot 5A (3-4')	55.5	25.7	18.8
Test Plot 7A (0-2')	56.6	24.9	18.4
Test Plot 10A (6-7')	58.7	23.4	17.9

Laboratory Data and Graphical Plots

Initial Properties

Summary of Initial Moisture Content*, Dry Bulk Density*, Wet Bulk Density, and Calculated Porosity

Sample Number	Initial Moisture Content		Dry Bulk Density	Wet Bulk Density	Calculated Porosity
	Gravimetric (%, g/g)	Volumetric (%, cm^3/cm^3)	(g/cm^3)	(g/cm^3)	(%)
Test Plot 1B (0-2')	12.3	17.2	1.40	1.57	47.6
Test Plot 1B (2-3')	12.7	17.8	1.39	1.57	46.0
Test Plot 1B (4-5')	13.2	18.3	1.39	1.57	46.3
Test Plot 3C (0-2')	11.1	15.4	1.39	1.54	47.9
Test Plot 3C (2-3')	13.2	18.3	1.38	1.57	46.9
Test Plot 5A (3-4')	12.1	16.9	1.40	1.57	46.0
Test Plot 7A (0-2')	12.1	16.9	1.40	1.57	47.0
Test Plot 10A (6-7')	11.3	15.9	1.41	1.57	46.6

*Samples were remolded to between 1.35 and 1.55 g/cm^3 (or 1.4 g/cm^3) at as received moisture content per instructions from Lewis Munk

NA = Not analyzed

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Golder
Job Number: LB05.0119.00
Sample Number: Test Plot 1B (0-2')
Ring Number: NA
Depth: NA

Test Date: 1-Jun-05

Field weight of sample* (g): 317.72
Tare weight, ring (g): 88.83
Tare weight, cap/plate/epoxy (g): 0.00

Dry weight of sample (g): 203.83
Sample volume (cm^3): 145.79
Measured particle density: 2.67

Initial Volumetric Moisture Content (% vol): 17.2
Initial Gravimetric Moisture Content (% g/g): 12.3
Dry bulk density (g/cm^3): 1.40
Wet bulk density (g/cm^3): 1.57
Calculated Porosity (% vol): 47.6
Percent Saturation: 36.1

Comments:

* Weight including tares
NA = Not analyzed

Laboratory analysis by: T. Sciacca
Data entered by: D. O'Dowd
Checked by: J. Hines

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Golder
Job Number: LB05.0119.00
Sample Number: Test Plot 1B (2-3')
Ring Number: NA
Depth: NA
Test Date: 1-Jun-05

Field weight of sample* (g): 308.02
Tare weight, ring (g): 86.74
Tare weight, cap/plate/epoxy (g): 0.00

Dry weight of sample (g): 196.26
Sample volume (cm^3): 140.73
Measured particle density: 2.58

Initial Volumetric Moisture Content (% vol): 17.8
Initial Gravimetric Moisture Content (% g/g): 12.7
Dry bulk density (g/cm^3): 1.39
Wet bulk density (g/cm^3): 1.57
Calculated Porosity (% vol): 46.0
Percent Saturation: 38.6

Comments:

* Weight including tares
NA = Not analyzed

Laboratory analysis by: T. Sciacca
Data entered by: D. O'Dowd
Checked by: J. Hines

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name:	Golder
Job Number:	LB05.0119.00
Sample Number:	Test Plot 1B (4-5')
Ring Number:	NA
Depth:	NA
Test Date:	1-Jun-05
Field weight of sample* (g):	336.68
Tare weight, ring (g):	116.59
Tare weight, cap/plate/epoxy (g):	0.00
Dry weight of sample (g):	194.35
Sample volume (cm^3):	140.32
Measured particle density:	2.58

Initial Volumetric Moisture Content (% vol):	18.3
Initial Gravimetric Moisture Content (% g/g):	13.2
Dry bulk density (g/cm^3):	1.39
Wet bulk density (g/cm^3):	1.57
Calculated Porosity (% vol):	46.3
Percent Saturation:	39.6

Comments:

* Weight including tares
NA = Not analyzed

Laboratory analysis by: T. Sciacca
Data entered by: D. O'Dowd
Checked by: J. Hines

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Golder
Job Number: LB05.0119.00
Sample Number: Test Plot 3C (0-2')
Ring Number: NA
Depth: NA

Test Date: 1-Jun-05

Field weight of sample* (g): 332.45
Tare weight, ring (g): 115.57
Tare weight, cap/plate/epoxy (g): 0.00

Dry weight of sample (g): 195.14
Sample volume (cm^3): 140.88
Measured particle density: 2.66

Initial Volumetric Moisture Content (% vol): 15.4
Initial Gravimetric Moisture Content (% g/g): 11.1
Dry bulk density (g/cm^3): 1.39
Wet bulk density (g/cm^3): 1.54
Calculated Porosity (% vol): 47.9
Percent Saturation: 32.2

Comments:

* Weight including tares
NA = Not analyzed

Laboratory analysis by: T. Sciacca
Data entered by: D. O'Dowd
Checked by: J. Hines

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Golder
Job Number: LB05.0119.00
Sample Number: Test Plot 3C (2-3')
Ring Number: NA
Depth: NA
Test Date: 1-Jun-05

Field weight of sample* (g): 340.20
Tare weight, ring (g): 121.52
Tare weight, cap/plate/epoxy (g): 0.00

Dry weight of sample (g): 193.10
Sample volume (cm^3): 139.54
Measured particle density: 2.61

Initial Volumetric Moisture Content (% vol): 18.3
Initial Gravimetric Moisture Content (% g/g): 13.2
Dry bulk density (g/cm^3): 1.38
Wet bulk density (g/cm^3): 1.57
Calculated Porosity (% vol): 46.9
Percent Saturation: 39.1

Comments:

* Weight including tares
NA = Not analyzed

Laboratory analysis by: T. Sciacca
Data entered by: D. O'Dowd
Checked by: J. Hines

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Golder
Job Number: LB05.0119.00
Sample Number: Test Plot 5A (3-4')
Ring Number: NA
Depth: NA
Test Date: 1-Jun-05

Field weight of sample* (g): 341.69
Tare weight, ring (g): 121.92
Tare weight, cap/plate/epoxy (g): 0.00

Dry weight of sample (g): 196.07
Sample volume (cm^3): 140.19
Measured particle density: 2.59

Initial Volumetric Moisture Content (% vol): 16.9
Initial Gravimetric Moisture Content (% g/g): 12.1
Dry bulk density (g/cm^3): 1.40
Wet bulk density (g/cm^3): 1.57
Calculated Porosity (% vol): 46.0
Percent Saturation: 36.8

Comments:

* Weight including tares
NA = Not analyzed

Laboratory analysis by: T. Sciacca
Data entered by: D. O'Dowd
Checked by: J. Hines

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Golder
Job Number: LB05.0119.00
Sample Number: Test Plot 7A (0-2')
Ring Number: NA
Depth: NA
Test Date: 1-Jun-05

Field weight of sample* (g): 336.64
Tare weight, ring (g): 116.03
Tare weight, cap/plate/epoxy (g): 0.00

Dry weight of sample (g): 196.76
Sample volume (cm^3): 140.71
Measured particle density: 2.64

Initial Volumetric Moisture Content (% vol): 16.9
Initial Gravimetric Moisture Content (% g/g): 12.1
Dry bulk density (g/cm^3): 1.40
Wet bulk density (g/cm^3): 1.57
Calculated Porosity (% vol): 47.0
Percent Saturation: 36.0

Comments:

* Weight including tares
NA = Not analyzed

Laboratory analysis by: T. Sciacca
Data entered by: D. O'Dowd
Checked by: J. Hines

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Golder
Job Number: LB05.0119.00
Sample Number: Test Plot 10A (6-7')
Ring Number: NA
Depth: NA

Test Date: 1-Jun-05

Field weight of sample* (g): 338.36
Tare weight, ring (g): 117.48
Tare weight, cap/plate/epoxy (g): 0.00

Dry weight of sample (g): 198.51
Sample volume (cm^3): 140.90
Measured particle density: 2.64

Initial Volumetric Moisture Content (% vol): 15.9
Initial Gravimetric Moisture Content (% g/g): 11.3
Dry bulk density (g/cm^3): 1.41
Wet bulk density (g/cm^3): 1.57
Calculated Porosity (% vol): 46.6
Percent Saturation: 34.0

Comments:

* Weight including tares
NA = Not analyzed

Laboratory analysis by: T. Sciacca
Data entered by: D. O'Dowd
Checked by: J. Hines

Saturated Hydraulic Conductivity

Summary of Saturated Hydraulic Conductivity Tests

Sample Number	K_{sat} (cm/sec)	Method of Analysis	
		Constant Head	Falling Head
Test Plot 1B (0-2')	1.6E-03	X	
Test Plot 1B (2-3')	1.9E-03	X	
Test Plot 1B (4-5')	7.9E-04	X	
Test Plot 3C (0-2')	1.6E-03	X	
Test Plot 3C (2-3')	2.5E-03	X	
Test Plot 5A (3-4')	2.7E-04	X	
Test Plot 7A (0-2')	1.9E-04	X	
Test Plot 10A (6-7')	2.0E-04	X	

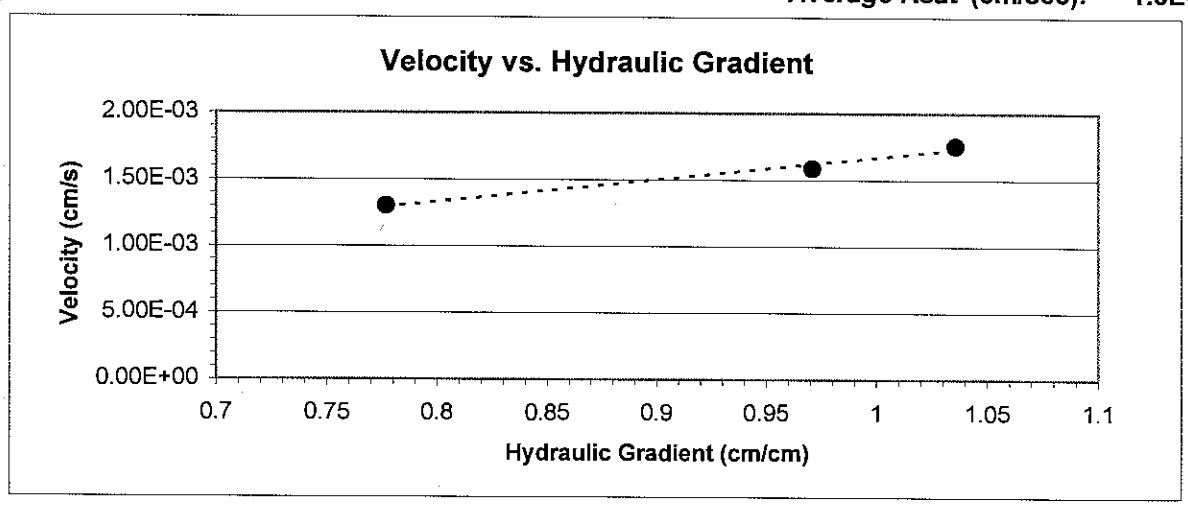
Saturated Hydraulic Conductivity
Constant Head Method

Job name: Golder
Job number: LB05.0119.00
Sample number: Test Plot 1B (0-2')
Ring Number: NA
Depth: NA

Type of water used: TAP
Collection vessel tare (g): 10.80
Sample length (cm): 7.73
Sample diameter (cm): 4.90
Sample x-sectional area (cm^2): 18.87

Date	Time	Temp (°C)	Head (cm)	Q + Tare (g)	Q (cm^3)	Elapsed time (sec)	Ksat (cm/sec)	Ksat @ 20°C (cm/sec)
Test # 1:								
08-Jun-05	14:59:27	21.0	7.5	40.7	29.9	998	1.6E-03	1.6E-03
08-Jun-05	15:16:05							
Test # 2:								
09-Jun-05	09:02:12	21.0	8.0	22.0	11.2	338	1.7E-03	1.7E-03
09-Jun-05	09:07:50							
Test # 3:								
09-Jun-05	09:17:05	21.0	6.0	19.2	8.4	343	1.7E-03	1.6E-03
09-Jun-05	09:22:48							

***Average Ksat* (cm/sec):** **1.6E-03**



Comments:

Laboratory analysis by: M. Carrillo
Data entered by: M. Carrillo
Checked by: J. Hines

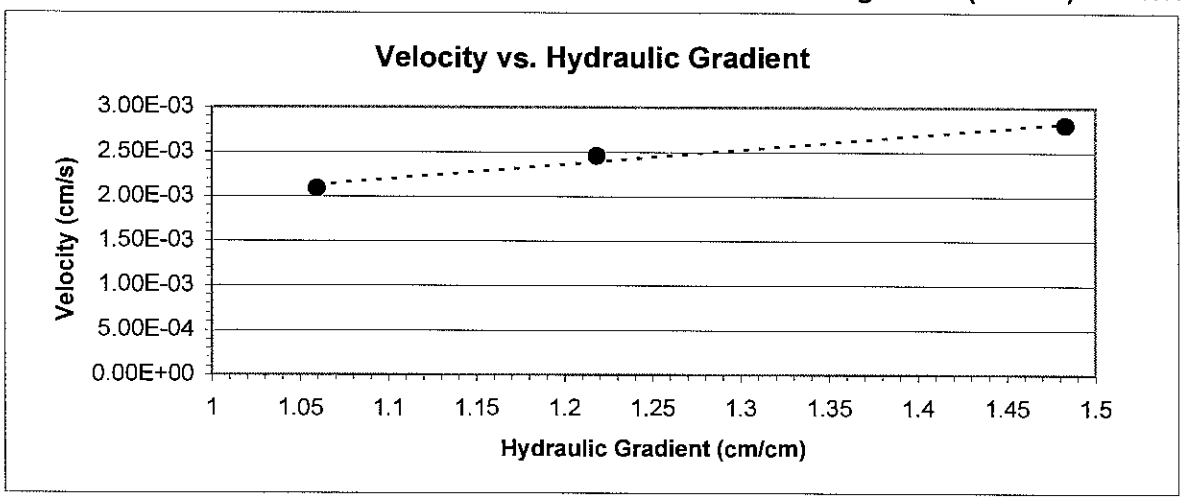
Saturated Hydraulic Conductivity
Constant Head Method

Job name: Golder
Job number: LB05.0119.00
Sample number: Test Plot 1B (2-3')
Ring Number: NA
Depth: NA

Type of water used: TAP
Collection vessel tare (g): 6.59
Sample length (cm): 7.55
Sample diameter (cm): 4.87
Sample x-sectional area (cm^2): 18.63

Date	Time	Temp (°C)	Head (cm)	Q + Tare (g)	Q (cm^3)	Elapsed time (sec)	Ksat (cm/sec)	Ksat @ 20°C (cm/sec)
Test # 1:								
07-Jun-05	09:43:00	21.0	11.2	23.7	17.1	327	1.9E-03	1.8E-03
07-Jun-05	09:48:27							
Test # 2:								
07-Jun-05	16:34:45	21.0	9.2	29.4	22.8	497	2.0E-03	2.0E-03
07-Jun-05	16:43:02							
Test # 3:								
08-Jun-05	08:15:44	21.0	8.0	21.7	15.1	386	2.0E-03	1.9E-03
08-Jun-05	08:22:10							

***Average Ksat* (cm/sec):** **1.9E-03**



Comments:

Laboratory analysis by: M. Carrillo
Data entered by: M. Carrillo
Checked by: J. Hines

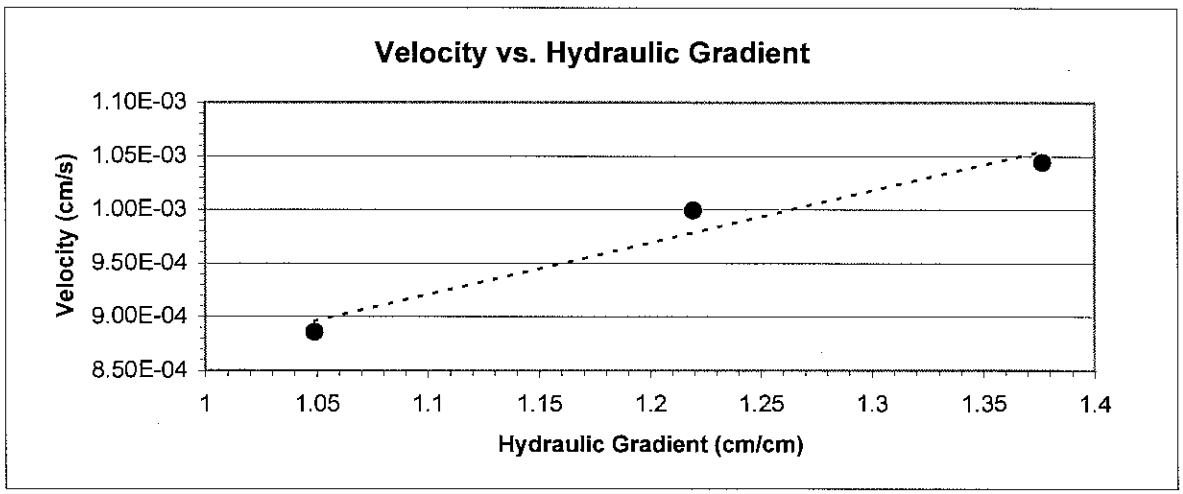
Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Constant Head Method

Job name:	Golder	*Type of water used:*	TAP
Job number:	LB05.0119.00	*Collection vessel tare* (g):	10.71
Sample number:	Test Plot 1B (4-5')	*Sample length* (cm):	7.63
Ring Number:	NA	*Sample diameter* (cm):	4.84
Depth:	NA	*Sample x-sectional area* (cm^2):	18.40

Date	Time	Temp (°C)	Head (cm)	Q + Tare (g)	Q (cm^3)	Elapsed time (sec)	Ksat (cm/sec)	Ksat @ 20°C (cm/sec)
Test # 1:								
08-Jun-05	08:27:00	21.0	10.5	23.7	13.0	677	7.6E-04	7.4E-04
08-Jun-05	08:38:17							
Test # 2:								
08-Jun-05	15:26:42	21.0	9.3	19.4	8.7	472	8.2E-04	8.0E-04
08-Jun-05	15:34:34							
Test # 3:								
09-Jun-05	08:30:00	21.0	8.0	18.4	7.7	470	8.4E-04	8.2E-04
09-Jun-05	08:37:50							

***Average Ksat* (cm/sec):** **7.9E-04**



Comments:

Laboratory analysis by: M. Carrillo
Data entered by: M. Carrillo
Checked by: J. Hines

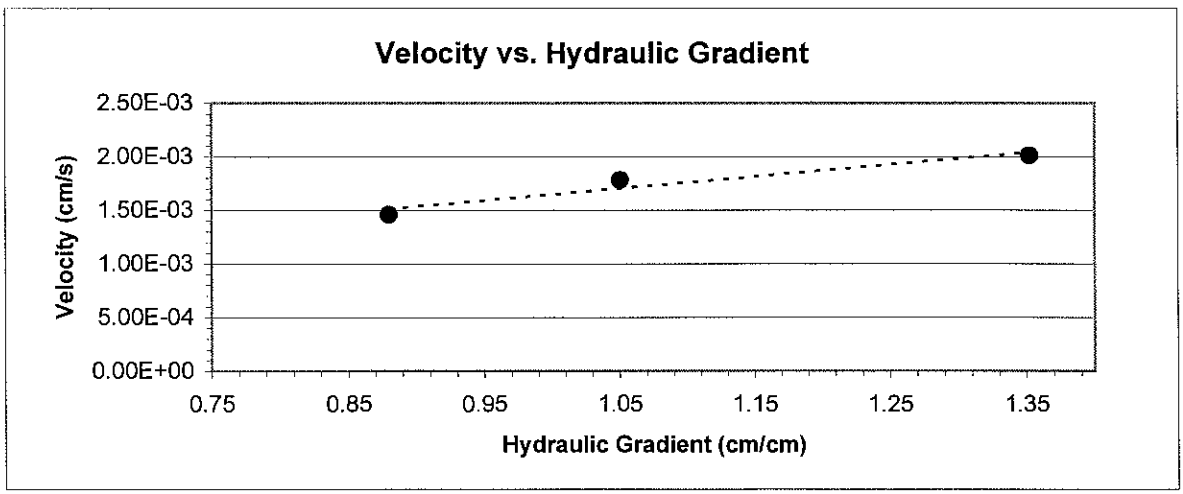
Saturated Hydraulic Conductivity
Constant Head Method

Job name: Golder
Job number: LB05.0119.00
Sample number: Test Plot 3C (0-2')
Ring Number: NA
Depth: NA

Type of water used: TAP
Collection vessel tare (g): 11.80
Sample length (cm): 7.62
Sample diameter (cm): 4.85
Sample x-sectional area (cm^2): 18.50

Date	Time	Temp (°C)	Head (cm)	Q + Tare (g)	Q (cm^3)	Elapsed time (sec)	Ksat (cm/sec)	Ksat @ 20°C (cm/sec)
Test # 1:								
07-Jun-05	09:41:38	21.0	10.3	25.1	13.3	357	1.5E-03	1.5E-03
07-Jun-05	09:47:35							
Test # 2:								
07-Jun-05	11:45:18	21.0	8.0	17.5	5.7	174	1.7E-03	1.7E-03
07-Jun-05	11:48:12							
Test # 3:								
08-Jun-05	08:14:20	21.0	6.7	22.0	10.2	377	1.7E-03	1.6E-03
08-Jun-05	08:20:37							

***Average Ksat* (cm/sec):** **1.6E-03**



Comments:

Laboratory analysis by: M. Carrillo
Data entered by: M. Carrillo
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

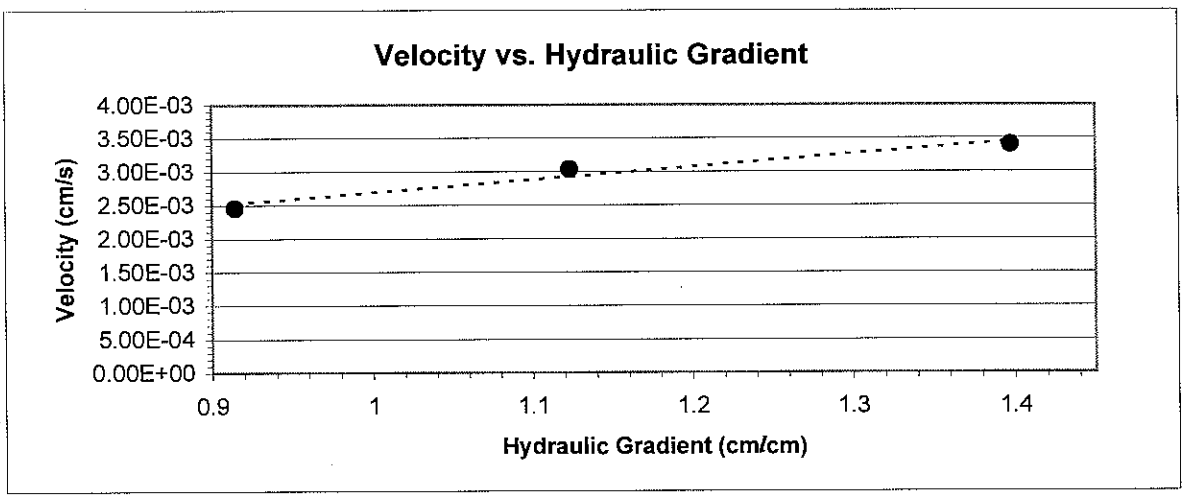
Saturated Hydraulic Conductivity
Constant Head Method

Job name: Golder
Job number: LB05.0119.00
Sample number: Test Plot 3C (2-3')
Ring Number: NA
Depth: NA

Type of water used: TAP
Collection vessel tare (g): 10.85
Sample length (cm): 7.66
Sample diameter (cm): 4.82
Sample x-sectional area (cm^2): 18.22

Date	Time	Temp (°C)	Head (cm)	Q + Tare (g)	Q (cm^3)	Elapsed time (sec)	Ksat (cm/sec)	Ksat @ 20°C (cm/sec)
Test # 1:								
06-Jun-05	08:20:30	21.0	10.7	32.6	21.7	350	2.4E-03	2.4E-03
06-Jun-05	08:26:20							
Test # 2:								
07-Jun-05	16:11:10	21.0	8.6	15.4	4.5	82	2.7E-03	2.6E-03
07-Jun-05	16:12:32							
Test # 3:								
08-Jun-05	08:14:42	21.0	7.0	28.1	17.2	384	2.7E-03	2.6E-03
08-Jun-05	08:21:06							

***Average Ksat* (cm/sec):** **2.5E-03**



Comments:

Laboratory analysis by: M. Carrillo
Data entered by: M. Carrillo
Checked by: J. Hines

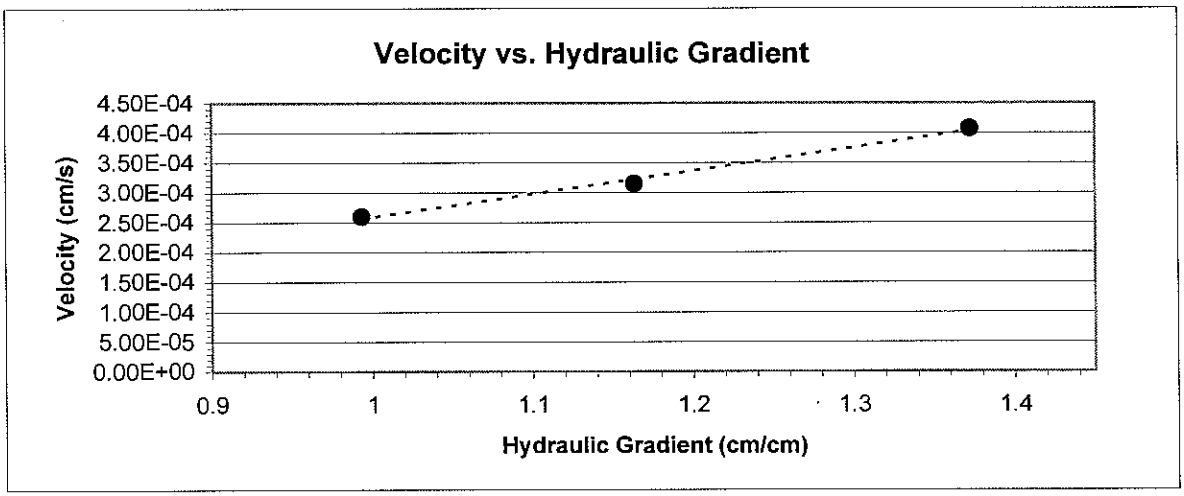
Saturated Hydraulic Conductivity
Constant Head Method

Job name: Golder
Job number: LB05.0119.00
Sample number: Test Plot 5A (3-4')
Ring Number: NA
Depth: NA

Type of water used: TAP
Collection vessel tare (g)*:* 11.28
Sample length (cm)*:* 7.65
Sample diameter (cm)*:* 4.83
Sample x-sectional area (cm^2)*:* 18.32

Date	Time	Temp (°C)	Head (cm)	Q + Tare (g)	Q (cm^3)	Elapsed time (sec)	Ksat (cm/sec)	Ksat @ 20°C (cm/sec)
Test # 1:								
08-Jun-05	13:14:07	21.0	10.5	16.8	5.5	738	3.0E-04	2.9E-04
08-Jun-05	13:26:25							
Test # 2:								
09-Jun-05	08:36:19	21.0	8.9	16.8	5.5	951	2.7E-04	2.6E-04
09-Jun-05	08:52:10							
Test # 3:								
09-Jun-05	12:21:02	21.0	7.6	14.9	3.6	753	2.6E-04	2.6E-04
09-Jun-05	12:33:35							

Average Ksat* (cm/sec)*: **2.7E-04**



Comments:

Laboratory analysis by: M. Carrillo
Data entered by: M. Carrillo
Checked by: J. Hines

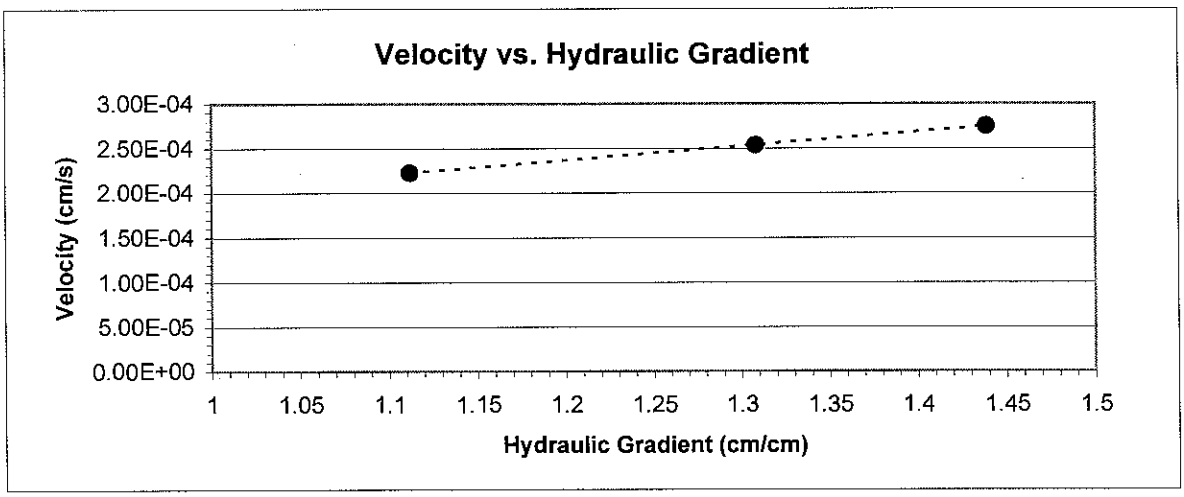
Saturated Hydraulic Conductivity
Constant Head Method

Job name: Golder
Job number: LB05.0119.00
Sample number: Test Plot 7A (0-2')
Ring Number: NA
Depth: NA

Type of water used: TAP
Collection vessel tare (g): 11.65
Sample length (cm): 7.65
Sample diameter (cm): 4.84
Sample x-sectional area (cm^2): 18.41

Date	Time	Temp (°C)	Head (cm)	Q + Tare (g)	Q (cm^3)	Elapsed time (sec)	Ksat (cm/sec)	Ksat @ 20°C (cm/sec)
Test # 1:								
08-Jun-05	08:27:25	21.0	11.0	15.2	3.5	695	1.9E-04	1.9E-04
08-Jun-05	08:39:00							
Test # 2:								
09-Jun-05	09:41:00	21.0	10.0	19.4	7.7	1649	1.9E-04	1.9E-04
09-Jun-05	10:08:29							
Test # 3:								
09-Jun-05	12:17:44	21.0	8.5	17.9	6.2	1516	2.0E-04	2.0E-04
09-Jun-05	12:43:00							

***Average Ksat* (cm/sec):** **1.9E-04**



Comments:

Laboratory analysis by: M. Carrillo
Data entered by: M. Carrillo
Checked by: J. Hines

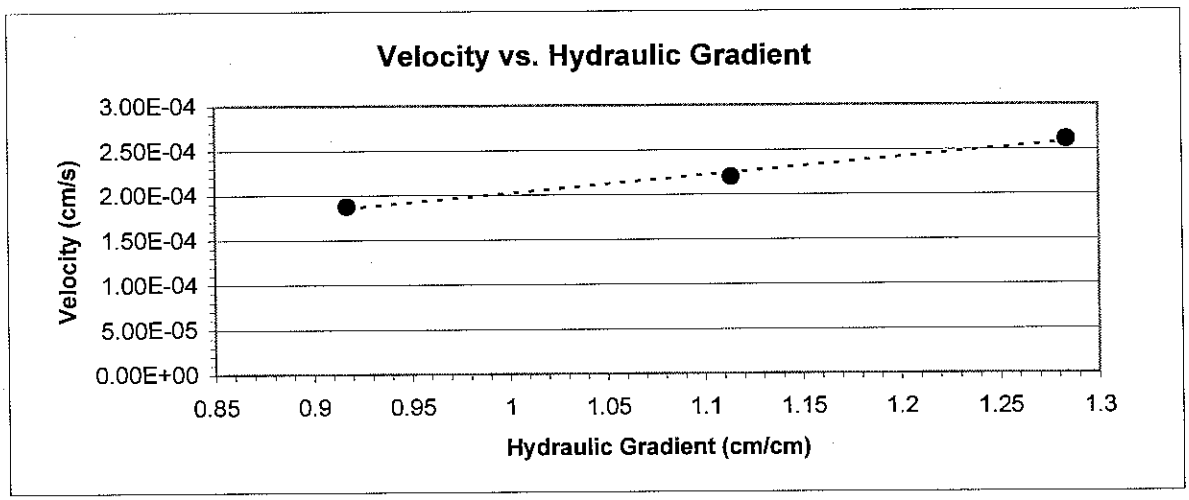
Saturated Hydraulic Conductivity
Constant Head Method

Job name: Golder
Job number: LB05.0119.00
Sample number: Test Plot 10A (6-7')
Ring Number: NA
Depth: NA

Type of water used: TAP
Collection vessel tare (g): 6.62
Sample length (cm): 7.63
Sample diameter (cm): 4.85
Sample x-sectional area (cm^2): 18.46

Date	Time	Temp (°C)	Head (cm)	Q + Tare (g)	Q (cm^3)	Elapsed time (sec)	Ksat (cm/sec)	Ksat @ 20°C (cm/sec)
Test # 1:								
08-Jun-05	13:08:00	21.0	9.8	11.7	5.1	1058	2.0E-04	2.0E-04
08-Jun-05	13:25:38							
Test # 2:								
09-Jun-05	08:34:50	21.0	8.5	10.6	4.0	987	2.0E-04	1.9E-04
09-Jun-05	08:51:17							
Test # 3:								
09-Jun-05	12:19:56	21.0	7.0	9.2	2.6	757	2.0E-04	2.0E-04
09-Jun-05	12:32:33							

***Average Ksat* (cm/sec):** **2.0E-04**



Comments:

Laboratory analysis by: M. Carrillo
Data entered by: M. Carrillo
Checked by: J. Hines

Unsaturated Hydraulic Conductivity

Summary of Moisture Characteristics of the Initial Drainage Curve

Sample Number	Pressure Head (-cm water)	Moisture Content (%, cm^3/cm^3)
Test Plot 1B (0-2')	0	46.9
	17	37.3
	52	32.6
	88	31.2
	510	25.8
	17541	15.9
	851293	2.9
Test Plot 1B (2-3')	0	51.3
	17	39.2
	52	33.8
	88	32.2
	510	26.2
	14277	13.0
	851293	3.2
Test Plot 1B (4-5')	0	46.9
	22	36.6
	51	34.0
	124	31.3
	510	26.3
	17439	13.9
	851293	3.4
Test Plot 3C (0-2')	0	48.7
	11	45.4
	31	35.8
	77	31.4
	510	24.8
	15093	15.8
	851293	3.4

Summary of Moisture Characteristics of the Initial Drainage Curve (Continued)

Sample Number	Pressure Head (-cm water)	Moisture Content (%, cm^3/cm^3)
Test Plot 3C (2-3')	0	49.8
	9	44.2
	31	36.1
	76	32.2
	510	25.5
	16521	13.2
	851293	3.4
Test Plot 5A (3-4')	0	46.2
	22	38.7
	51	34.2
	124	30.7
	510	25.7
	16521	11.9
	851293	2.9
Test Plot 7A (0-2')	0	45.6
	22	40.1
	51	35.2
	124	31.2
	510	26.6
	9076	14.3
	851293	3.1
Test Plot 10A (6-7')	0	43.1
	25	36.4
	52	32.0
	144	27.9
	510	24.5
	17031	12.5
	851293	2.6

Summary of Calculated Unsaturated Hydraulic Properties

Sample Number	α (cm^{-1})	N (dimensionless)	θ_r	θ_s
Test Plot 1B (0-2')	0.1509	1.1564	0.0000	0.4655
Test Plot 1B (2-3')	0.1731	1.1751	0.0000	0.5106
Test Plot 1B (4-5')	0.1006	1.1683	0.0000	0.4642
Test Plot 3C (0-2')	0.1266	1.1746	0.0000	0.4924
Test Plot 3C (2-3')	0.1369	1.1787	0.0000	0.4974
Test Plot 5A (3-4')	0.0605	1.1964	0.0000	0.4576
Test Plot 7A (0-2')	0.0455	1.1974	0.0000	0.4523
Test Plot 10A (6-7')	0.0628	1.1877	0.0000	0.4288

Moisture Retention Data

Hanging Column/Pressure Plate/Thermocouple

(Main Drainage Curve)

Job Name:	Golder	*Dry wt. of sample* (g):	203.83
Job Number:	LB05.0119.00	*Tare wt., screen & clamp* (g):	23.50
Sample Number:	Test Plot 1B (0-2')	*Tare wt., ring* (g):	88.83
Ring Number:	NA	*Tare wt., epoxy* (g):	0.00
Depth:	NA	*Sample volume* (cm^3):	145.79

Saturated weight at 0 cm tension* (g):	384.47
Volume of water[T] in saturated sample (cm^3):	68.31
Saturated moisture content (% vol):	46.85
Sample bulk density (g/cm^3):	1.40

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content[T] (% vol)
Hanging column:	13-Jun-05 / 09:45	384.47	0.00	46.85
	20-Jun-05 / 11:30	370.51	17.20	37.28
	27-Jun-05 / 13:25	363.76	51.50	32.65
	03-Jul-05 / 10:35	361.69	88.00	31.23
Pressure plate:	09-Jul-05 / 11:45	353.72	509.90	25.76

Comments:

* Weight including tares

[1] Assumed density of water is 1.0 g/cm^3

Laboratory analysis by: M. Carrillo
Data entered by: D. O'Dowd
Checked by: J. Hines

Moisture Retention Data

Water Activity Meter/Relative Humidity Box

(Main Drainage Curve)

Job Name: Golder
Job Number: LB05.0119.00
Sample Number: Test Plot 1B (0-2')
Ring Number: NA
Depth: NA

Dry weight of water activity meter sample* (g): 137.20
Tare weight, jar (g): 113.51
Sample bulk density (g/cm^3): 1.40

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content^T (% vol)
Water Activity Meter:	20-Jun-05 / 10:30	139.89	17540.6	15.88

Dry weight of relative humidity box sample* (g): 62.96
Tare weight (g): 37.12
Sample bulk density (g/cm^3): 1.40

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content^T (% vol)
Relative humidity box:	20-Jun-05 / 14:20	63.49	851293	2.85

Comments:

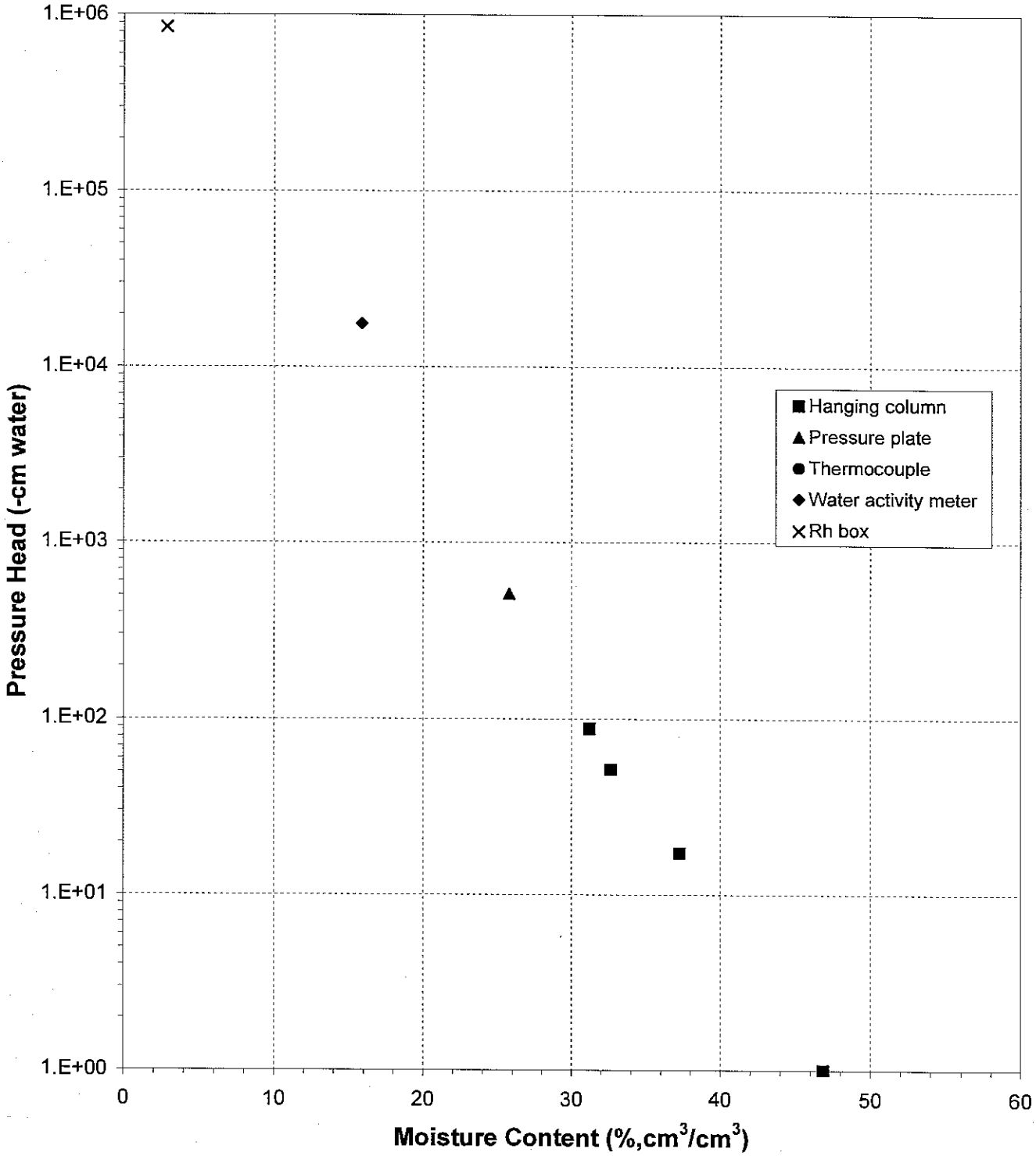
* Weight including tares

^{T} Assumed density of water is 1.0 g/cm^3

Laboratory analysis by: M. Carrillo/S. Shannon
Data entered by: D. O'Dowd
Checked by: J. Hines

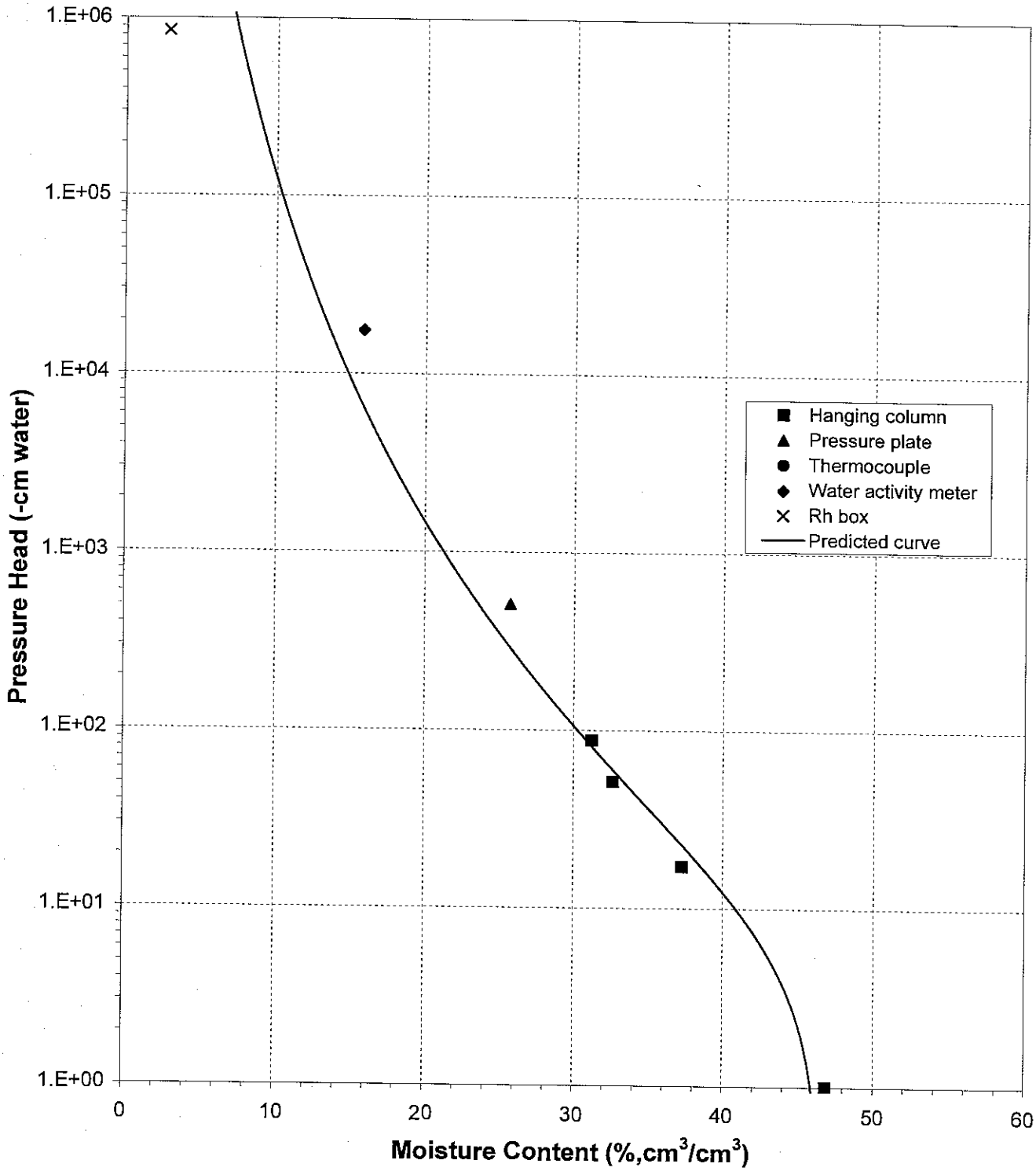
Water Retention Data Points

Sample Number: Test Plot 1B (0-2')



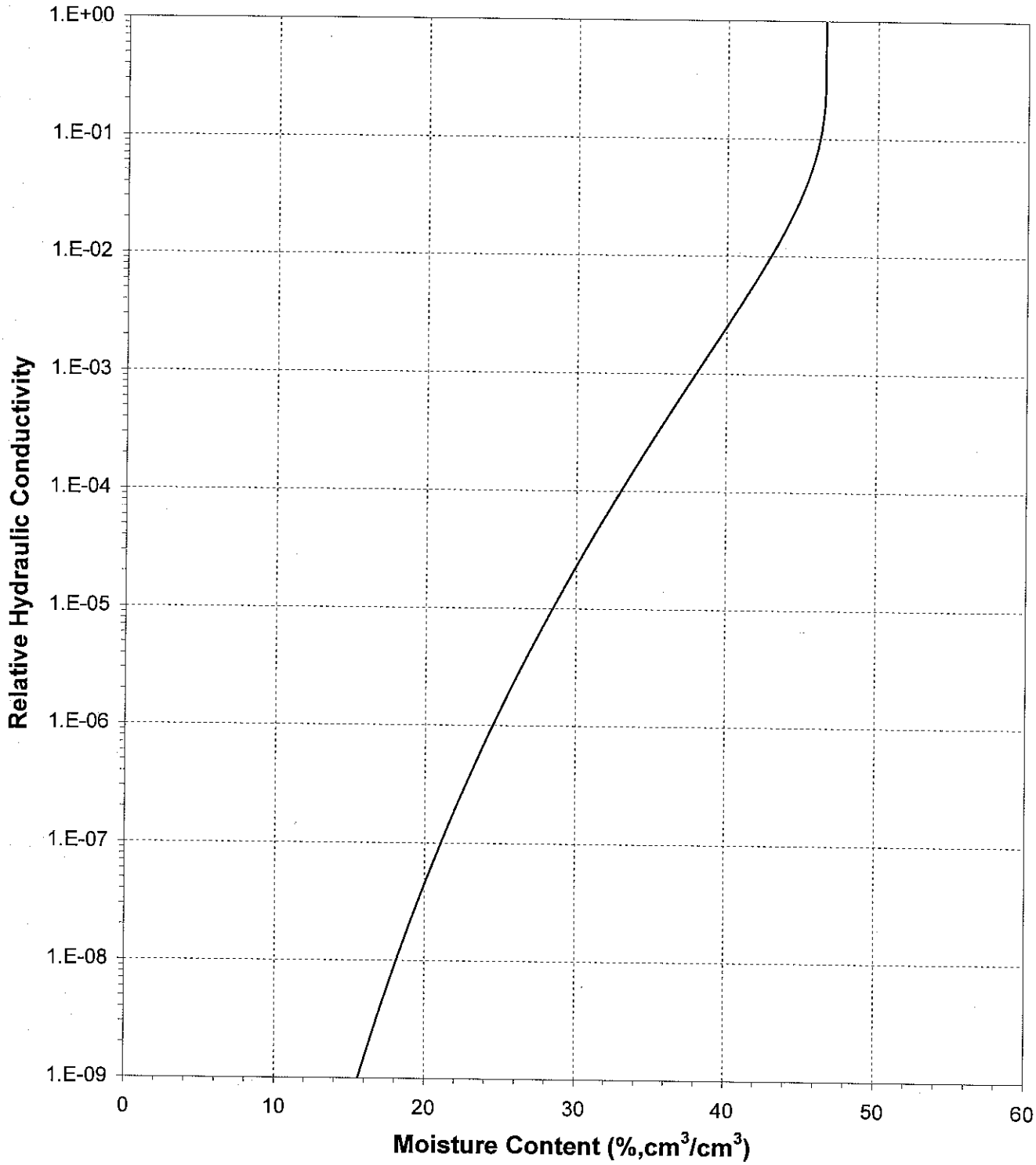
Predicted Water Retention Curve and Data Points

Sample Number: Test Plot 1B (0-2')



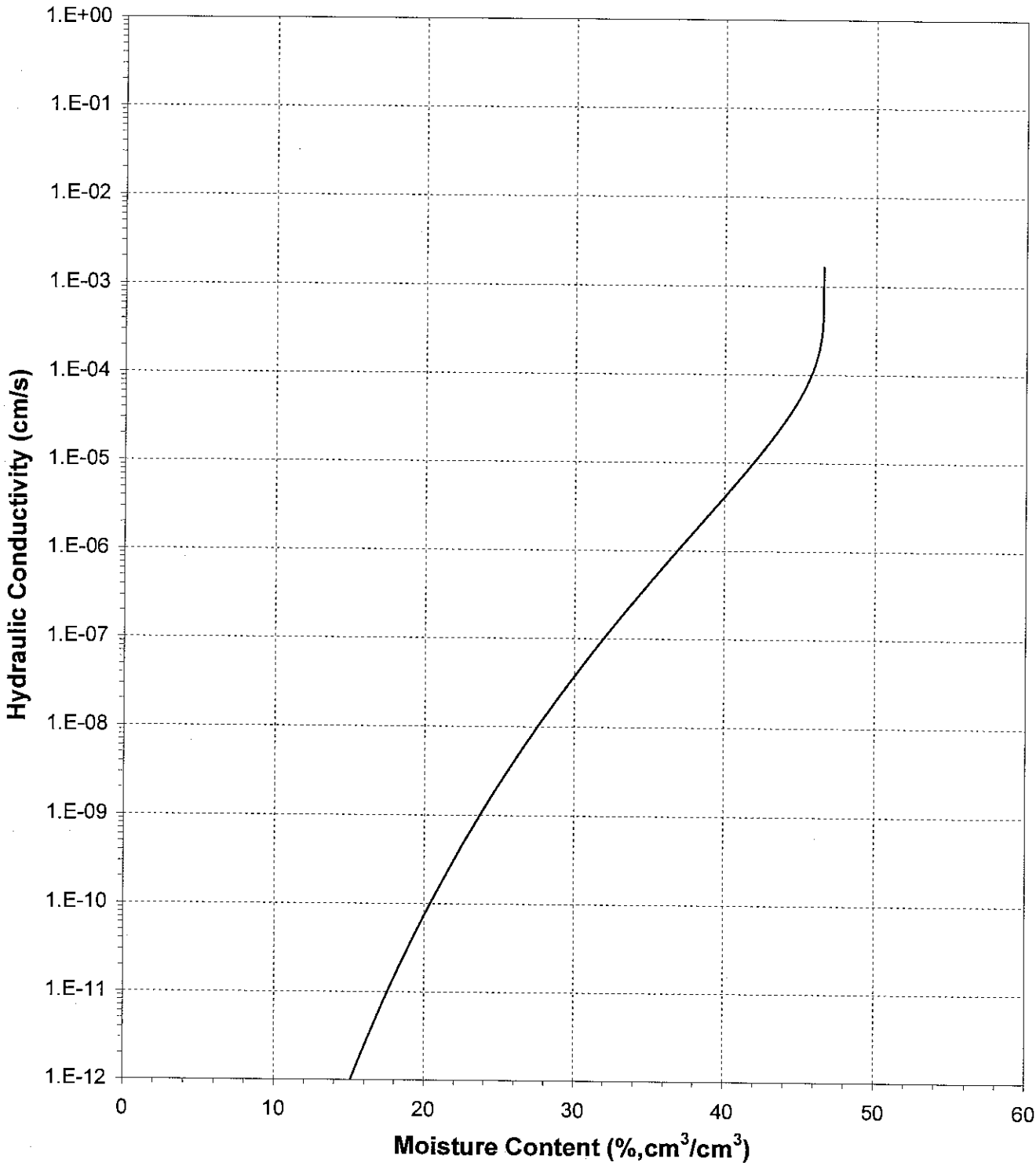
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: Test Plot 1B (0-2')



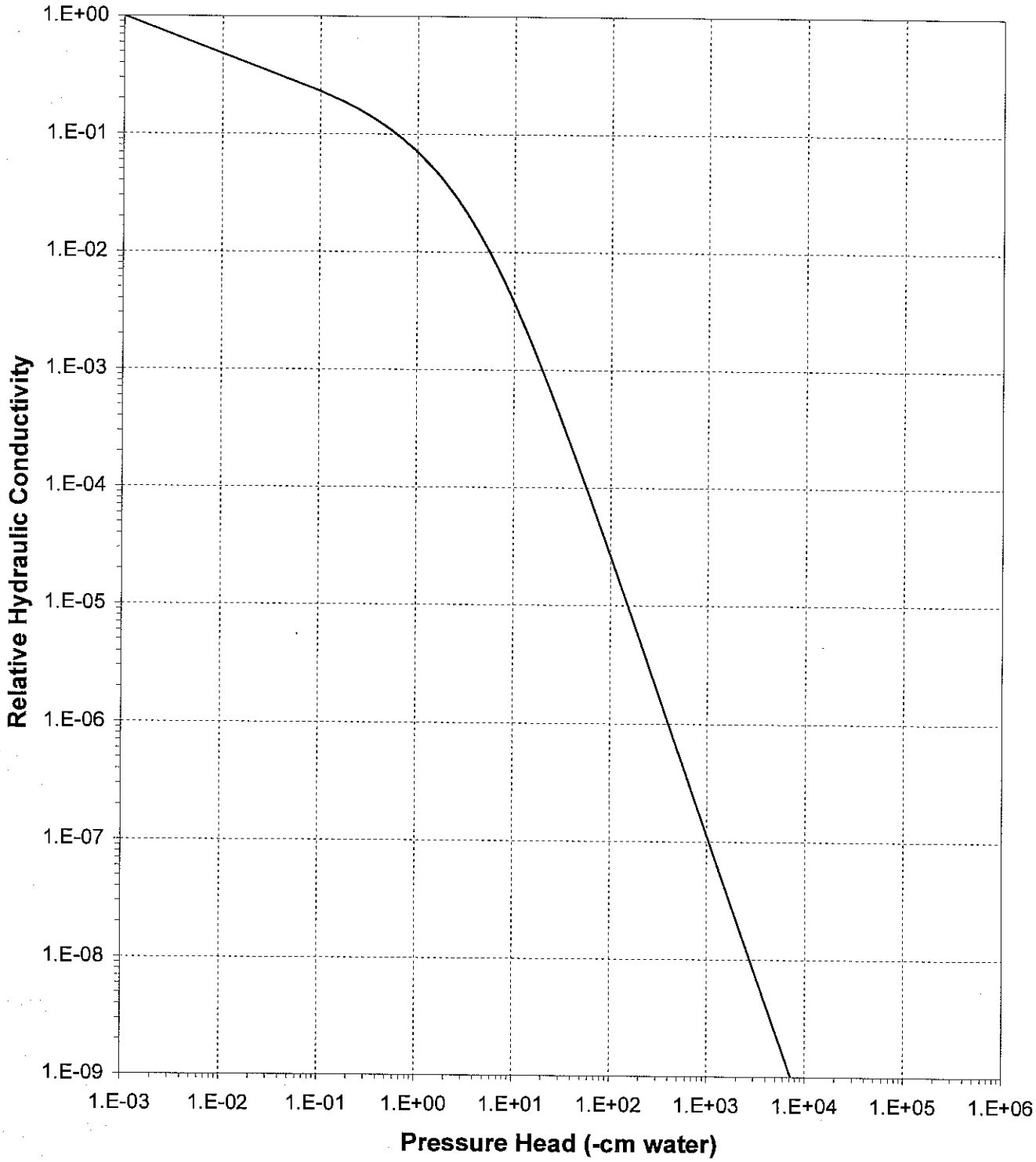
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: Test Plot 1B (0-2')



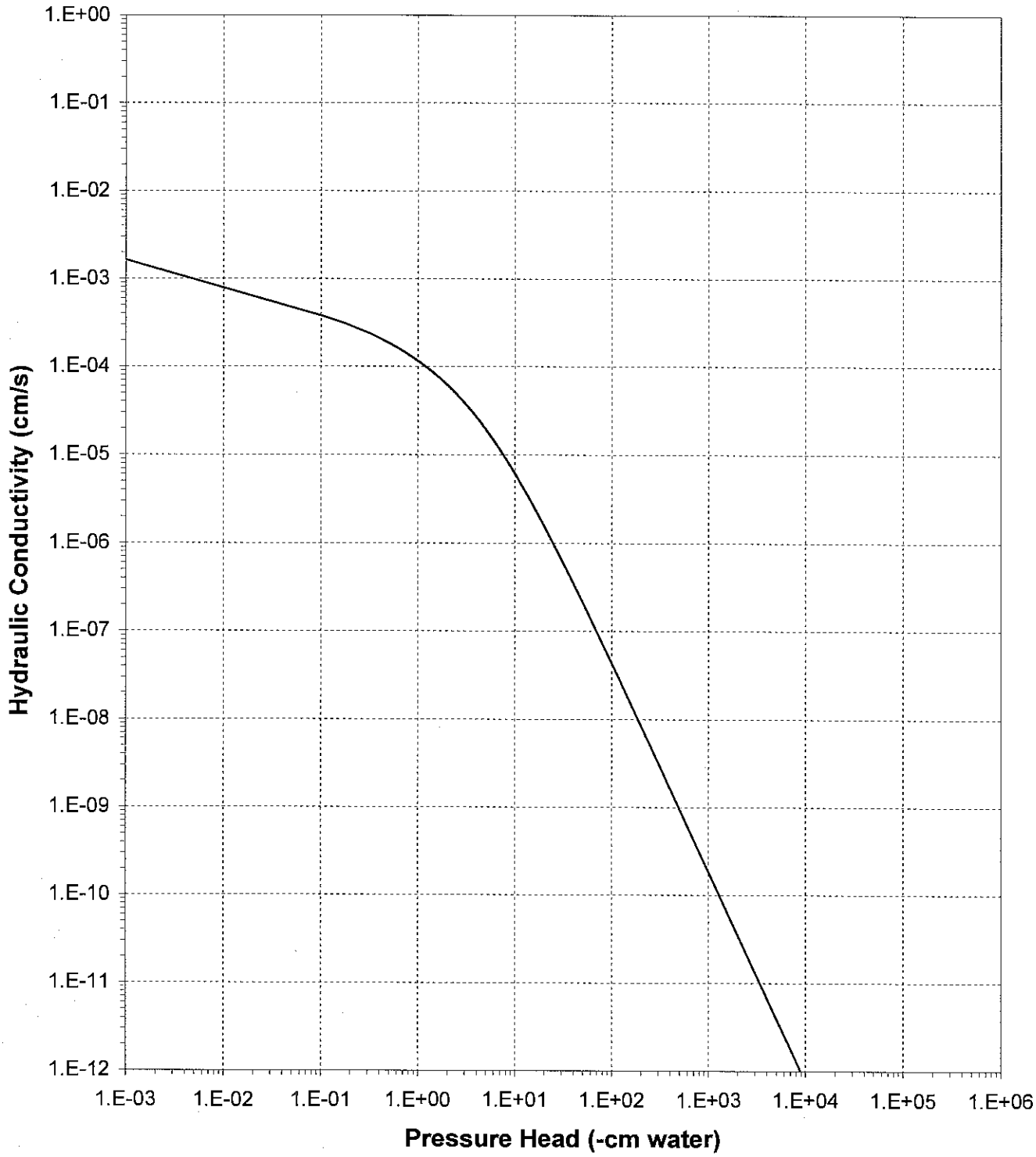
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: Test Plot 1B (0-2')



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: Test Plot 1B (0-2')



Moisture Retention Data

Hanging Column/Pressure Plate/Thermocouple

(Main Drainage Curve)

Job Name:	Golder	*Dry wt. of sample* (g):	196.26
Job Number:	LB05.0119.00	*Tare wt., screen & clamp* (g):	23.47
Sample Number:	Test Plot 1B (2-3')	*Tare wt., ring* (g):	86.74
Ring Number:	NA	*Tare wt., epoxy* (g):	0.00
Depth:	NA	*Sample volume* (cm^3):	140.73

Saturated weight at 0 cm tension* (g): 378.71
Volume of water[T] in saturated sample (cm^3): 72.24
Saturated moisture content (% vol): 51.33
Sample bulk density (g/cm^3): 1.39

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content[T] (% vol)
Hanging column:	13-Jun-05 / 11:55	378.71	0.00	51.33
	20-Jun-05 / 11:30	361.65	17.20	39.21
	27-Jun-05 / 12:25	354.00	51.50	33.77
	03-Jul-05 / 10:35	351.80	88.00	32.21
Pressure plate:	09-Jul-05 / 11:45	343.29	509.90	26.16

Comments:

* Weight including tares
[T] Assumed density of water is 1.0 g/cm^3

Laboratory analysis by: M. Carrillo
Data entered by: D. O'Dowd
Checked by: J. Hines

Moisture Retention Data

Water Activity Meter/Relative Humidity Box

(Main Drainage Curve)

Job Name: Golder
Job Number: LB05.0119.00
Sample Number: Test Plot 1B (2-3')
Ring Number: NA
Depth: NA

Dry weight of water activity meter sample* (g): 134.66
Tare weight, jar (g): 112.64
Sample bulk density (g/cm^3): 1.39

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content^T (% vol)
Water Activity Meter:	20-Jun-05 / 13:05	136.71	14277.2	12.98

Dry weight of relative humidity box sample* (g): 69.58
Tare weight (g): 39.03
Sample bulk density (g/cm^3): 1.39

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content^T (% vol)
Relative humidity box:	20-Jun-05 / 14:20	70.28	851293	3.19

Comments:

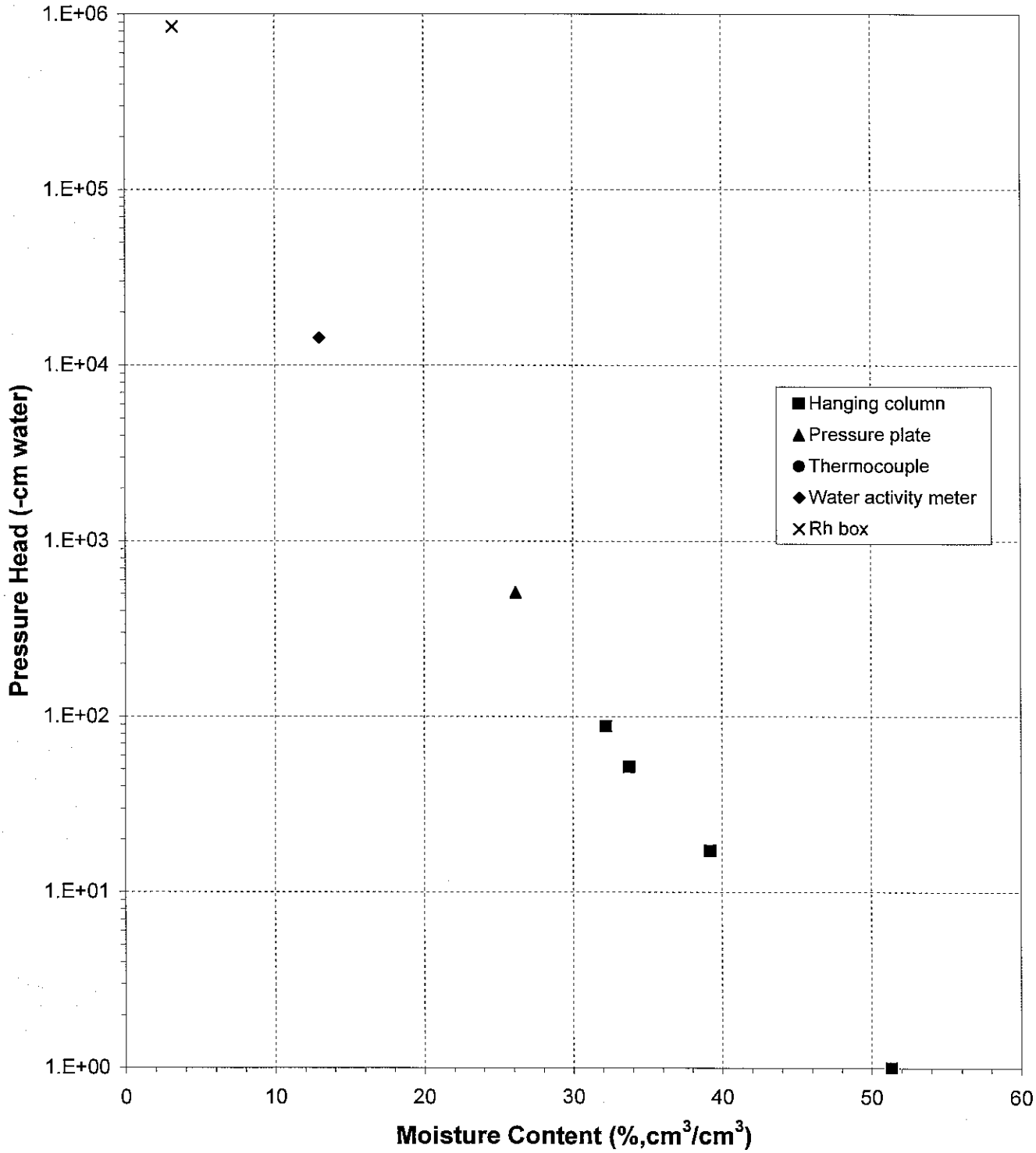
* Weight including tares

^{T} Assumed density of water is 1.0 g/cm^3

Laboratory analysis by: D. O'Dowd/S. Shannon
Data entered by: D. O'Dowd
Checked by: J. Hines

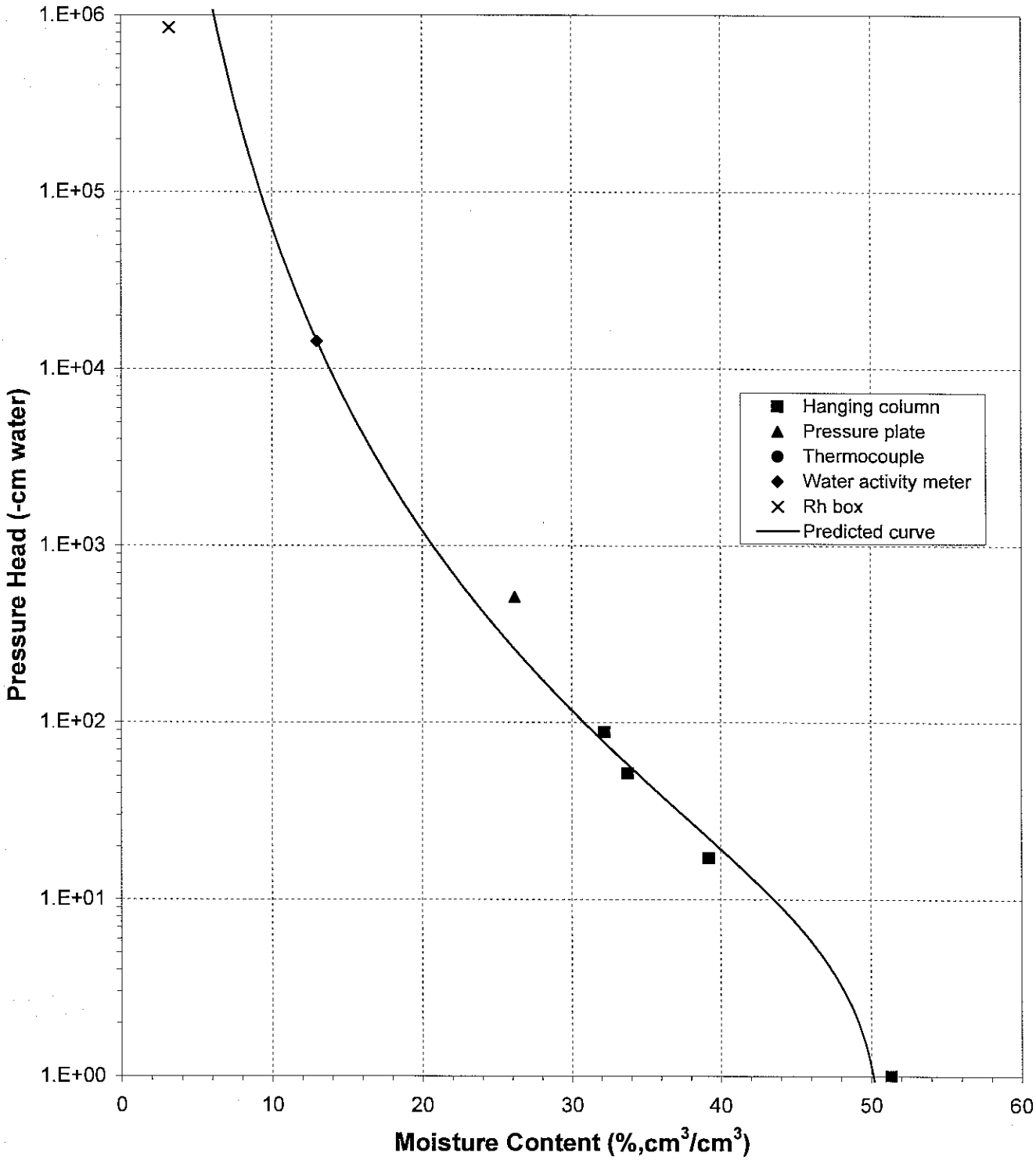
Water Retention Data Points

Sample Number: Test Plot 1B (2-3')



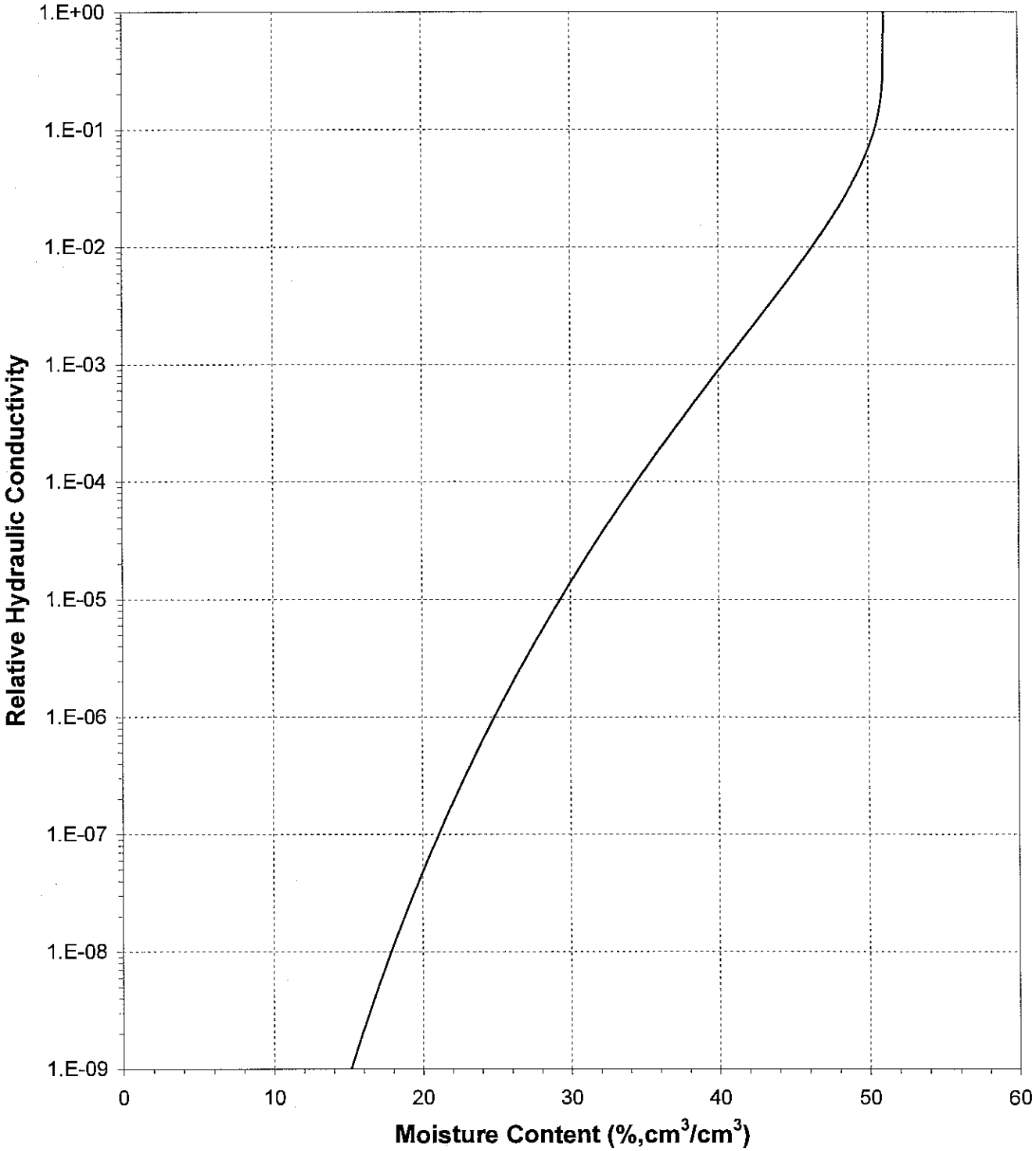
Predicted Water Retention Curve and Data Points

Sample Number: Test Plot 1B (2-3')



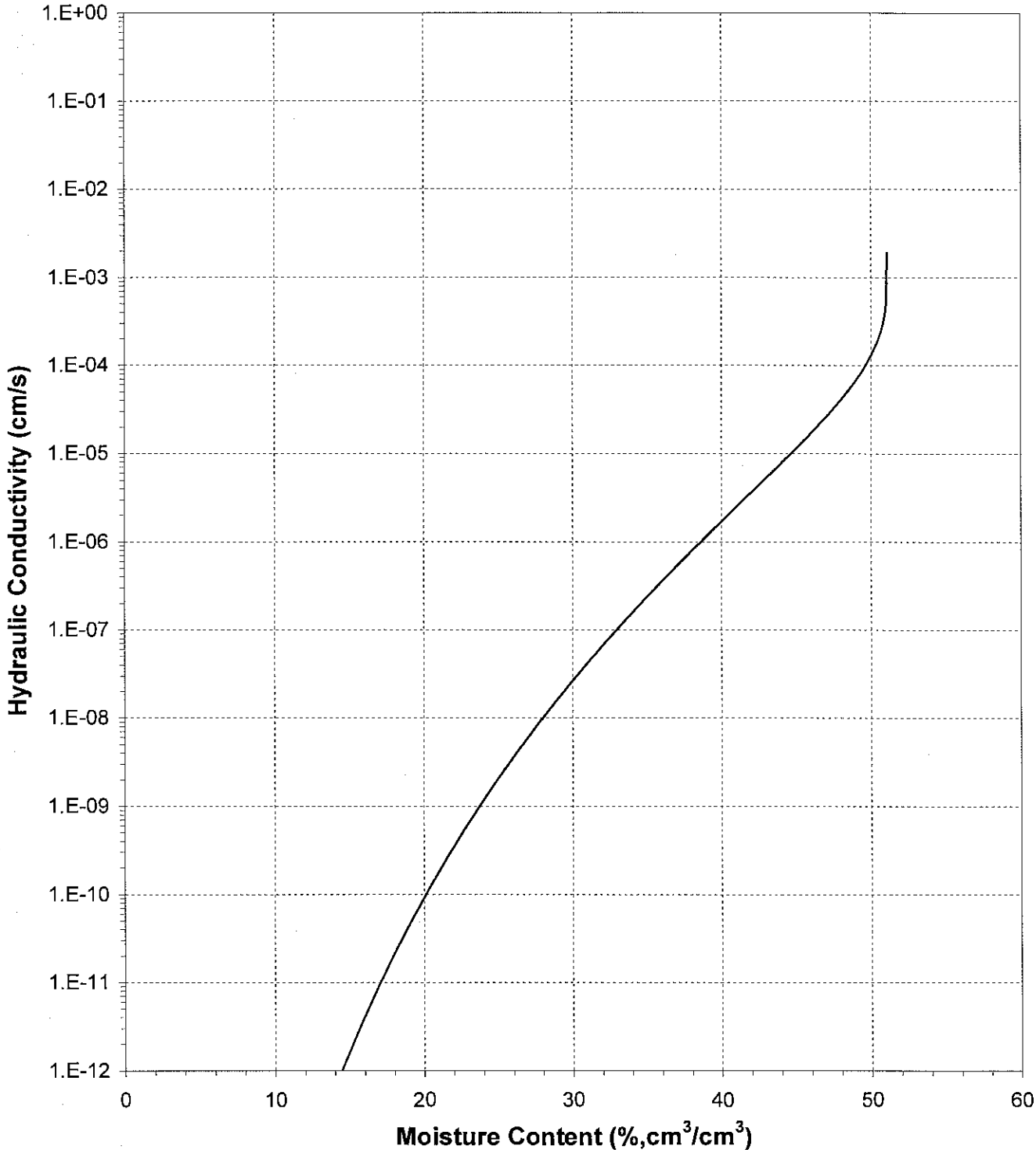
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: Test Plot 1B (2-3')



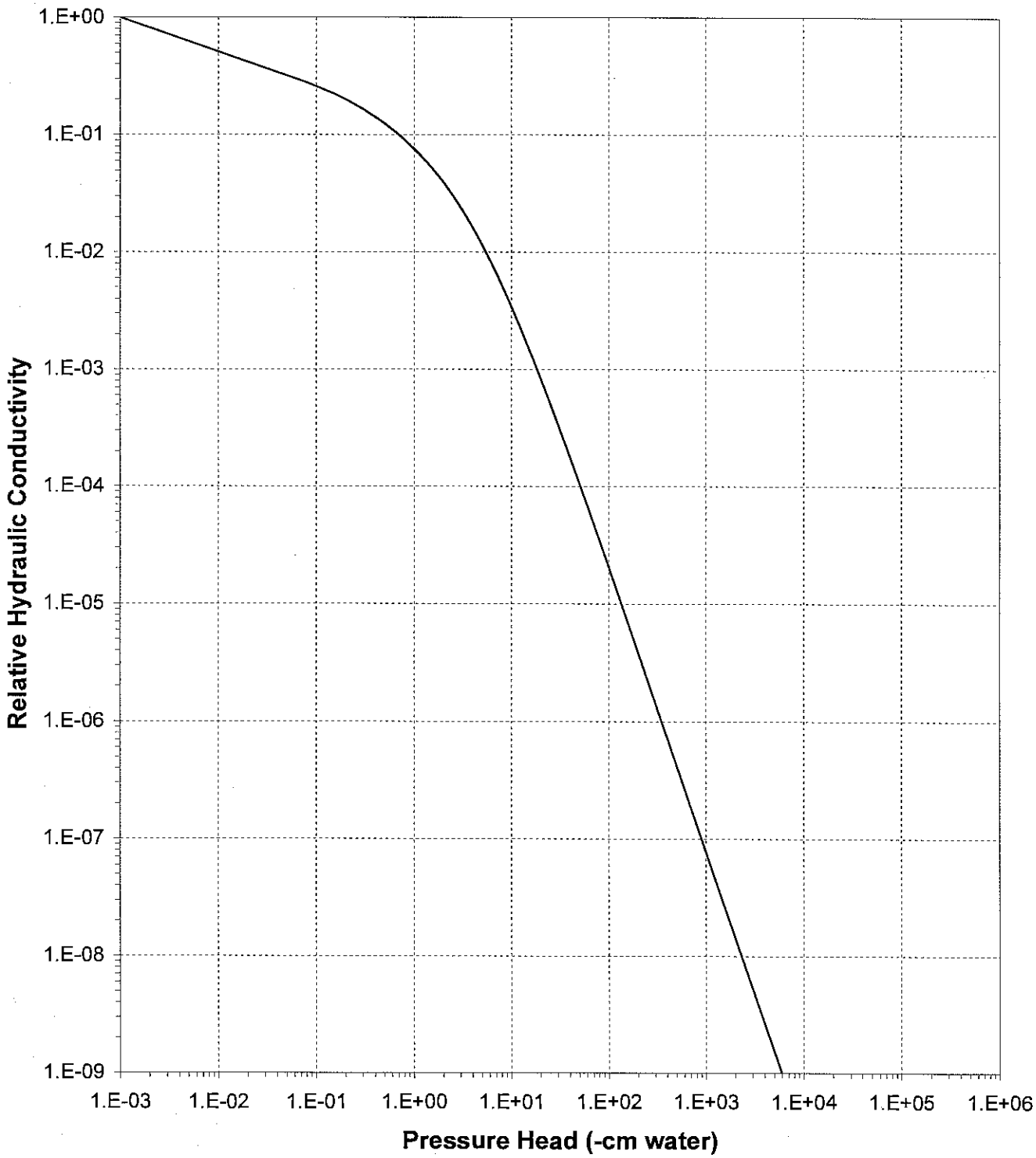
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: Test Plot 1B (2-3')



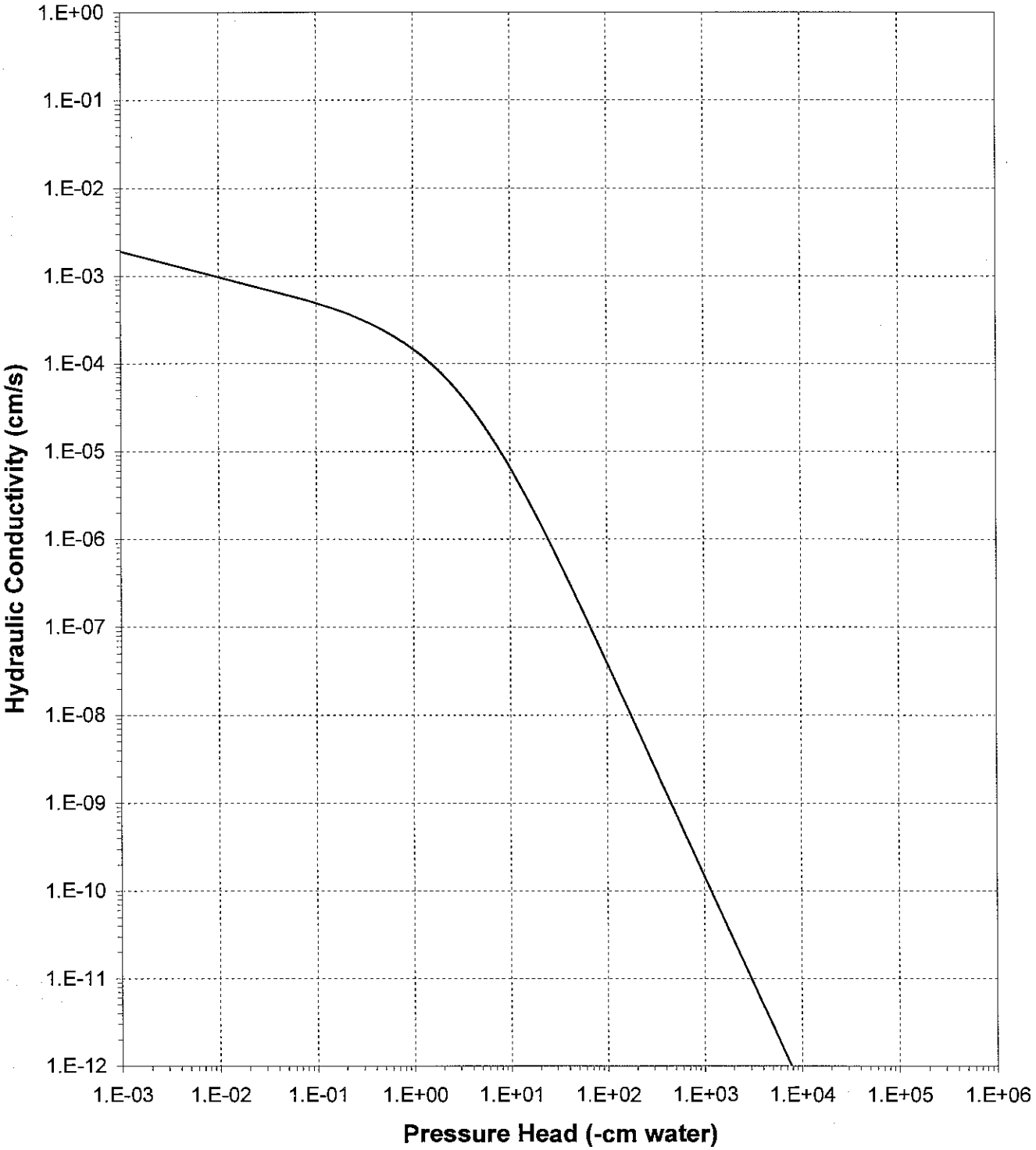
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: Test Plot 1B (2-3')



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: Test Plot 1B (2-3')



Moisture Retention Data

Hanging Column/Pressure Plate/Thermocouple

(Main Drainage Curve)

Job Name:	Golder	*Dry wt. of sample* (g):	194.35
Job Number:	LB05.0119.00	*Tare wt., screen & clamp* (g):	23.21
Sample Number:	Test Plot 1B (4-5')	*Tare wt., ring* (g):	116.59
Ring Number:	NA	*Tare wt., epoxy* (g):	0.00
Depth:	NA	*Sample volume* (cm^3):	140.32

Saturated weight at 0 cm tension* (g): 399.99
Volume of water[T] in saturated sample (cm^3): 65.84
Saturated moisture content (% vol): 46.92
Sample bulk density (g/cm^3): 1.39

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content[T] (% vol)
Hanging column:	13-Jun-05 / 09:50	399.99	0.00	46.92
	20-Jun-05 / 13:15	385.51	22.20	36.60
	27-Jun-05 / 13:45	381.92	51.00	34.04
	03-Jul-05 / 10:50	378.01	124.00	31.26
Pressure plate:	09-Jul-05 / 11:40	371.06	509.90	26.30

Comments:

* Weight including tares
[T] Assumed density of water is 1.0 g/cm^3

Laboratory analysis by: M. Carrillo
Data entered by: D. O'Dowd
Checked by: J. Hines

Moisture Retention Data

Water Activity Meter/Relative Humidity Box

(Main Drainage Curve)

Job Name: Golder
Job Number: LB05.0119.00
Sample Number: Test Plot 1B (4-5')
Ring Number: NA
Depth: NA

Dry weight of water activity meter sample* (g): 137.24
Tare weight, jar (g): 113.41
Sample bulk density (g/cm^3): 1.39

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content^T (% vol)
Water Activity Meter:	22-Jun-05 / 13:10	139.63	17438.6	13.89

Dry weight of relative humidity box sample* (g): 88.54
Tare weight (g): 41.87
Sample bulk density (g/cm^3): 1.39

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content^T (% vol)
Relative humidity box:	20-Jun-05 / 14:20	89.69	851293	3.43

Comments:

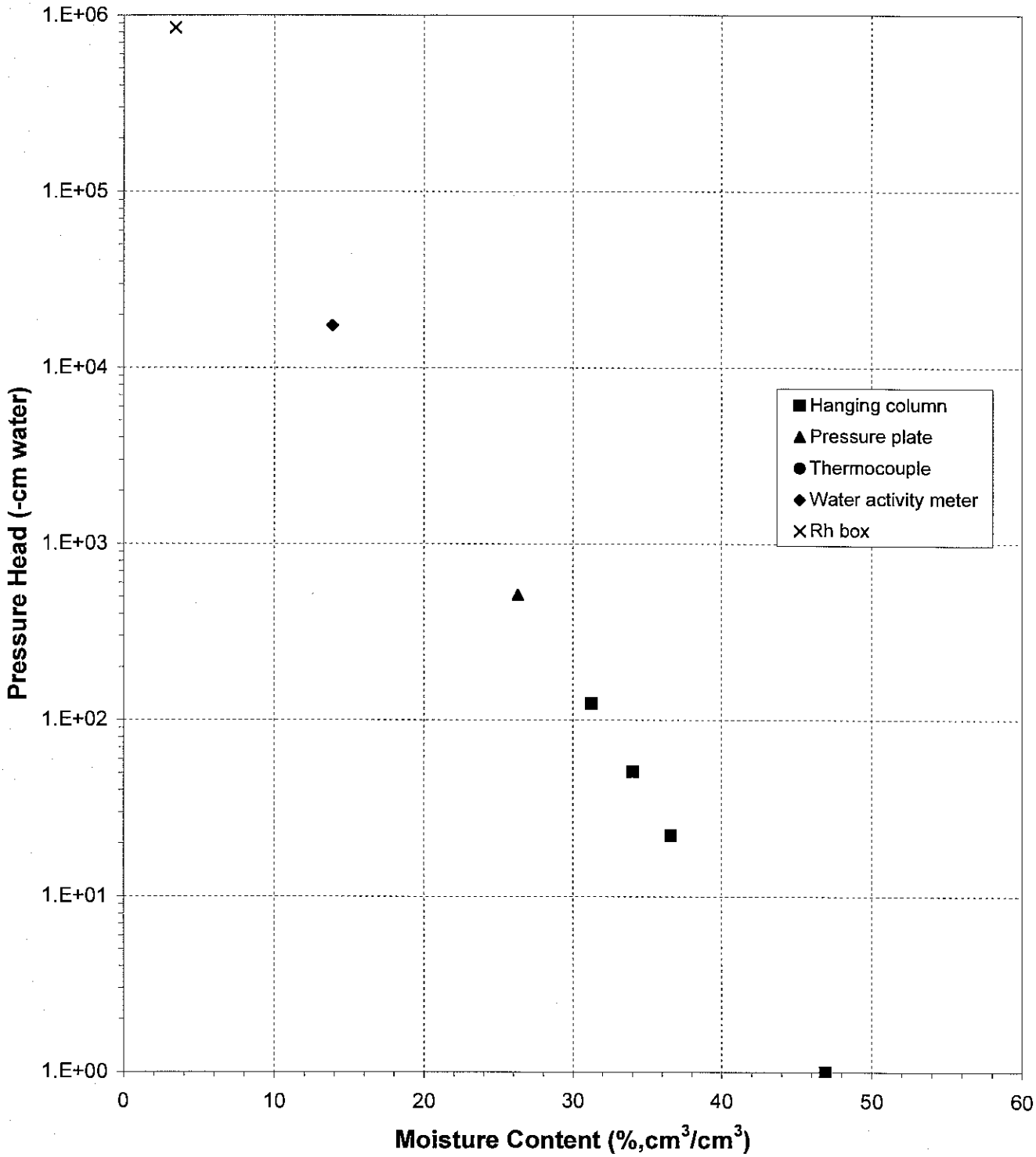
* Weight including tares

^{T} Assumed density of water is 1.0 g/cm^3

Laboratory analysis by: D. O'Dowd/S. Shannon
Data entered by: D. O'Dowd
Checked by: J. Hines

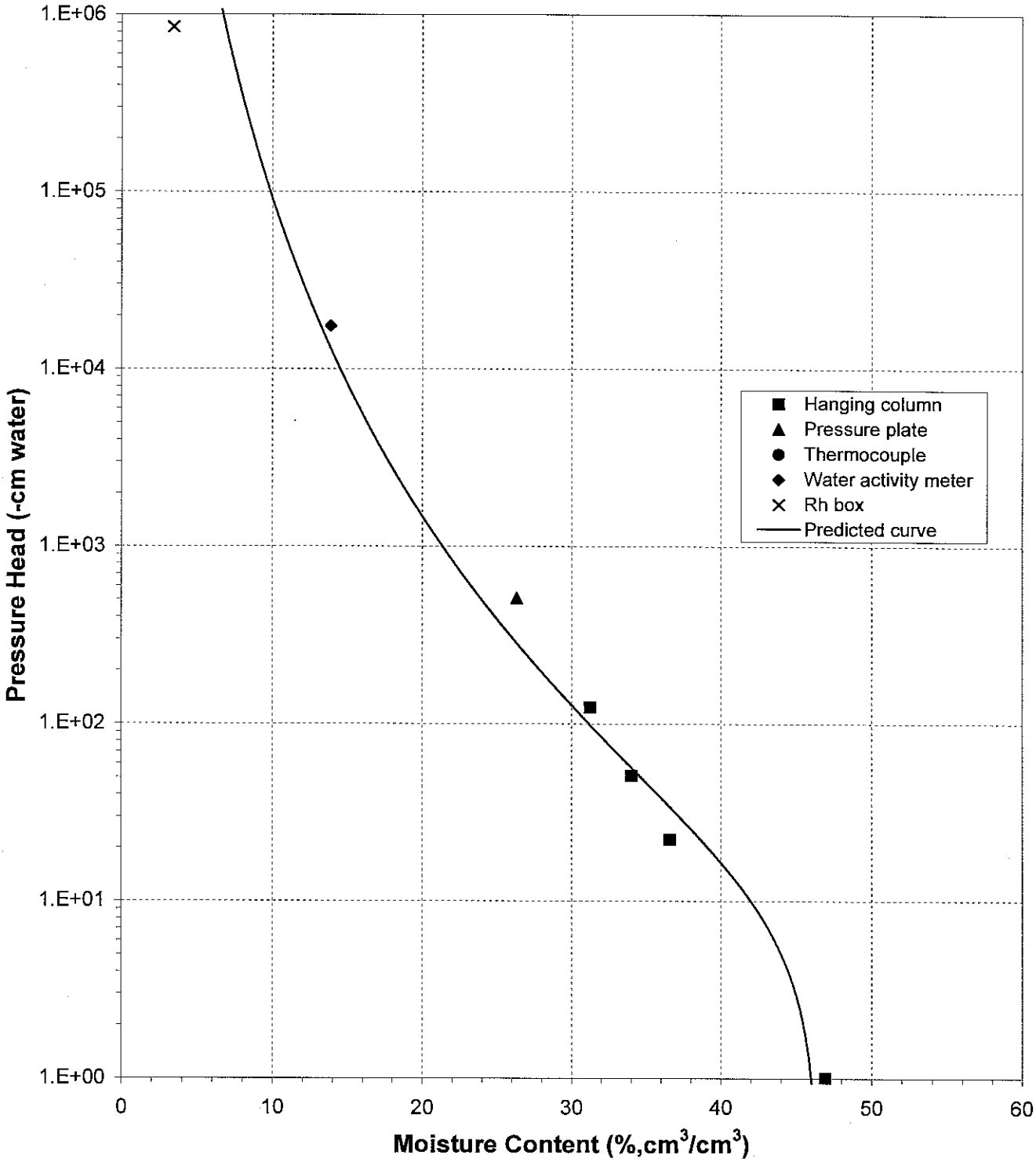
Water Retention Data Points

Sample Number: Test Plot 1B (4-5')



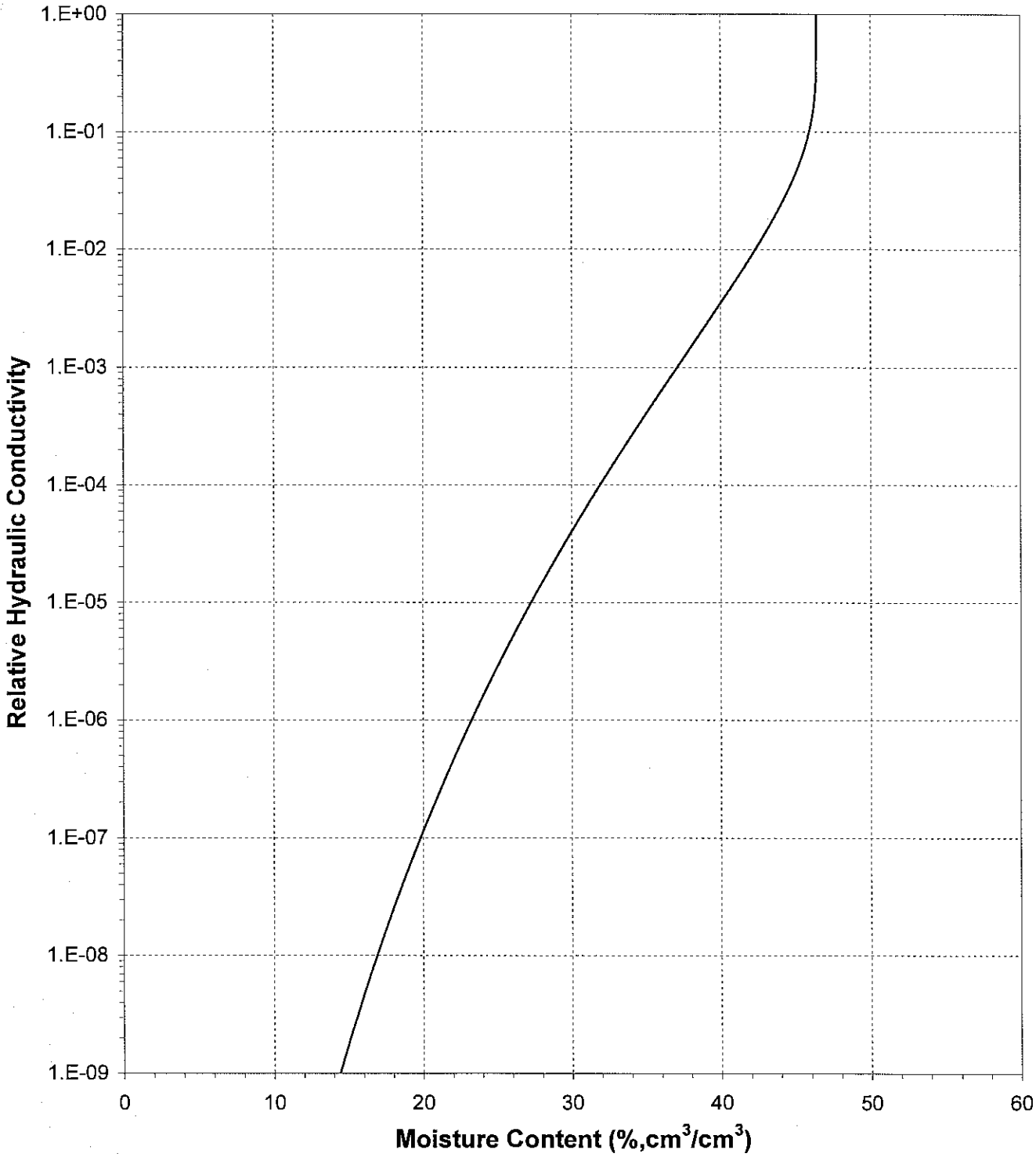
Predicted Water Retention Curve and Data Points

Sample Number: Test Plot 1B (4-5')



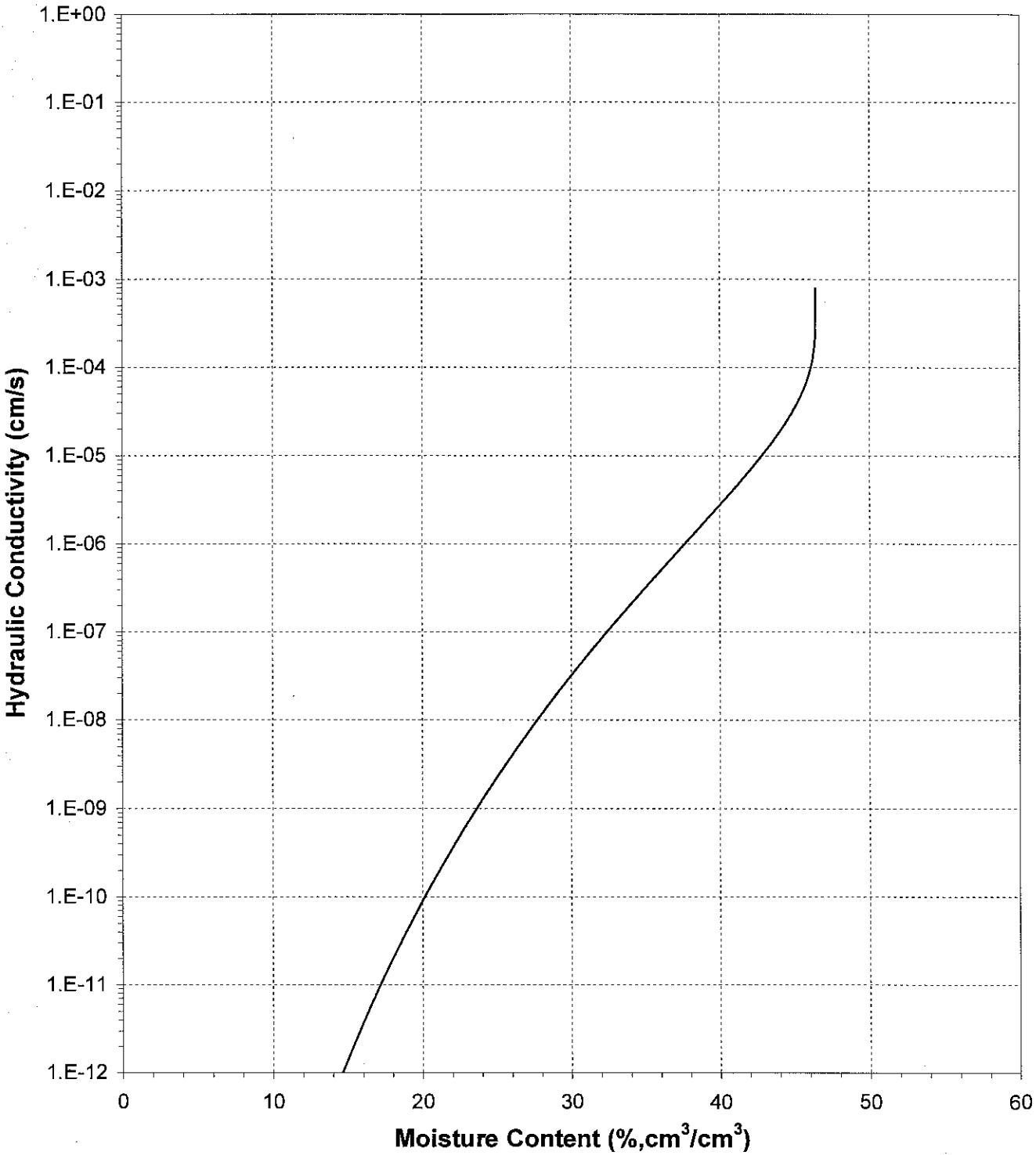
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: Test Plot 1B (4-5')



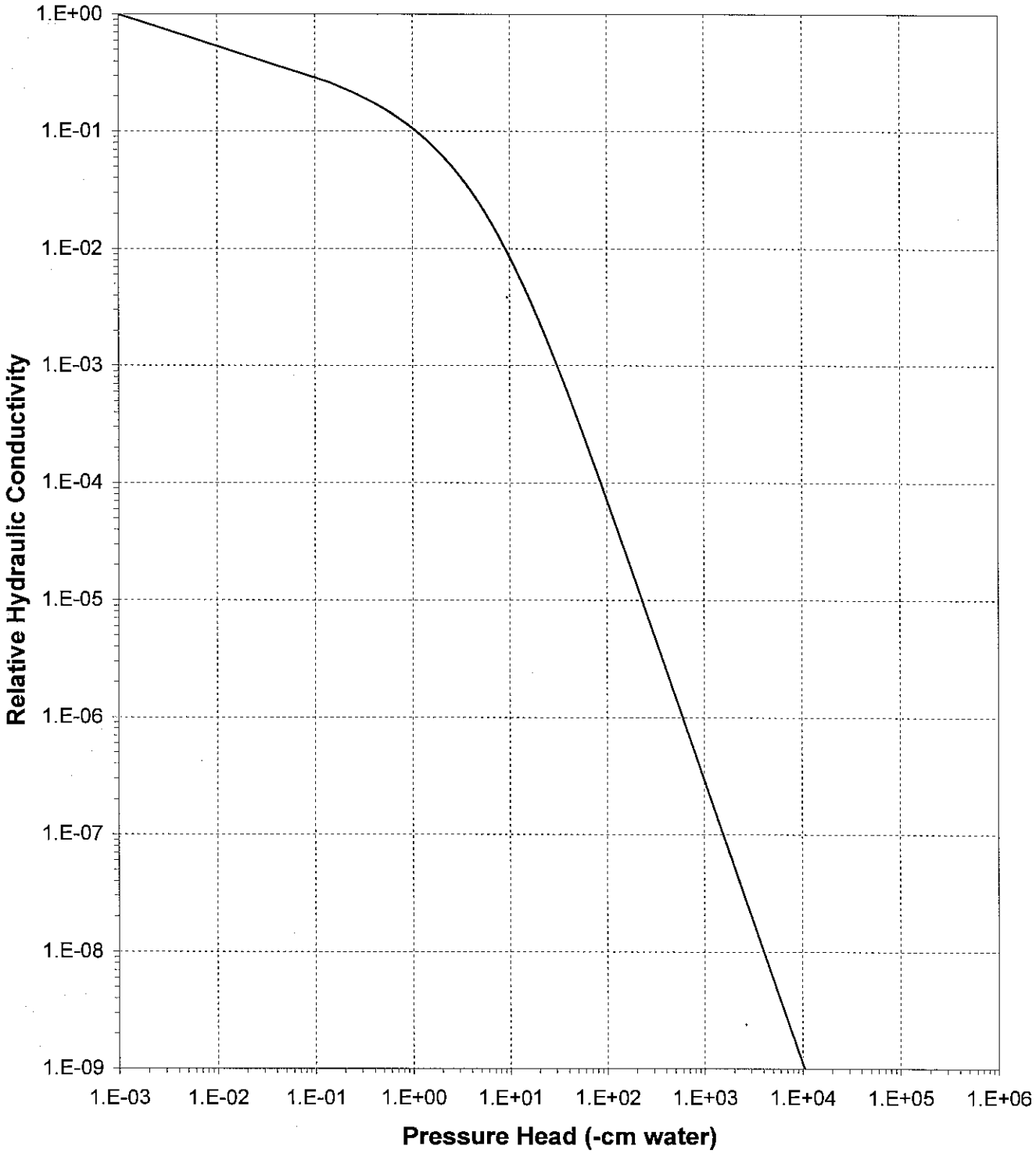
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: Test Plot 1B (4-5')



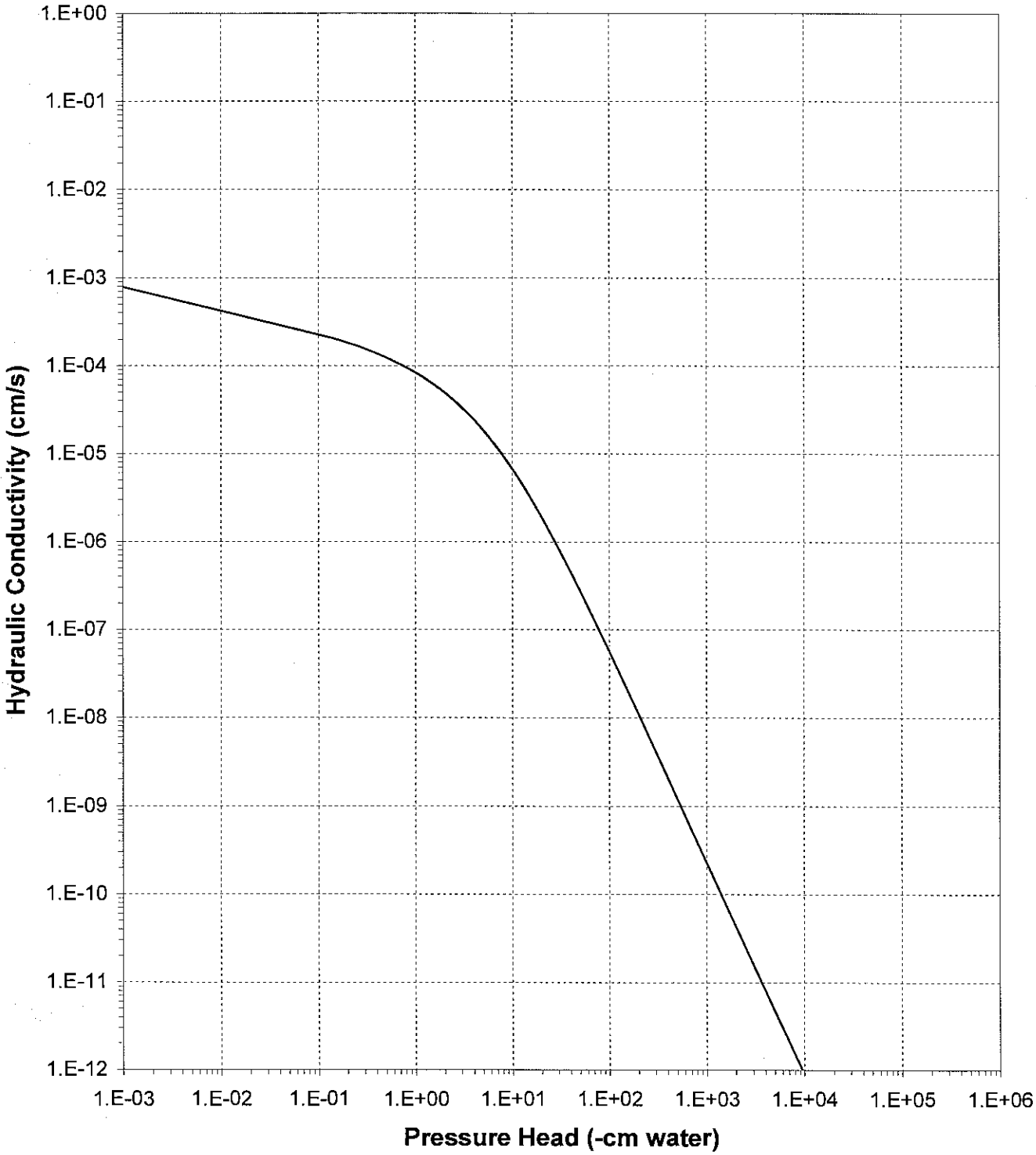
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: Test Plot 1B (4-5')



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: Test Plot 1B (4-5')



Moisture Retention Data

Hanging Column/Pressure Plate/Thermocouple

(Main Drainage Curve)

Job Name:	Golder	*Dry wt. of sample* (g):	195.14
Job Number:	LB05.0119.00	*Tare wt., screen & clamp* (g):	25.23
Sample Number:	Test Plot 3C (0-2')	*Tare wt., ring* (g):	115.57
Ring Number:	NA	*Tare wt., epoxy* (g):	0.00
Depth:	NA	*Sample volume* (cm^3):	140.88

Saturated weight at 0 cm tension* (g):	404.53
Volume of water[T] in saturated sample (cm^3):	68.59
Saturated moisture content (% vol):	48.69
Sample bulk density (g/cm^3):	1.39

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content[T] (% vol)
Hanging column:	09-Jun-05 / 15:40	404.53	0.00	48.69
	15-Jun-05 / 10:12	399.92	11.00	45.42
	21-Jun-05 / 16:35	386.39	30.70	35.81
	27-Jun-05 / 15:00	380.24	76.50	31.45
Pressure plate:	03-Jul-05 / 10:25	370.87	509.90	24.79

Comments:

* Weight including tares

[T] Assumed density of water is 1.0 g/cm^3

Laboratory analysis by: T. Bowekaty
Data entered by: M. Devine
Checked by: J. Hines

Moisture Retention Data

Water Activity Meter/Relative Humidity Box

(Main Drainage Curve)

Job Name: Golder
Job Number: LB05.0119.00
Sample Number: Test Plot 3C (0-2')
Ring Number: NA
Depth: NA

Dry weight of water activity meter sample* (g): 137.63
Tare weight, jar (g): 112.93
Sample bulk density (g/cm^3): 1.39

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content^T (% vol)
Water Activity Meter:	23-Jun-05 / 10:45	140.45	15093.0	15.81

Dry weight of relative humidity box sample* (g): 80.74
Tare weight (g): 40.79
Sample bulk density (g/cm^3): 1.39

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content^T (% vol)
Relative humidity box:	20-Jun-05 / 14:20	81.73	851293	3.43

Comments:

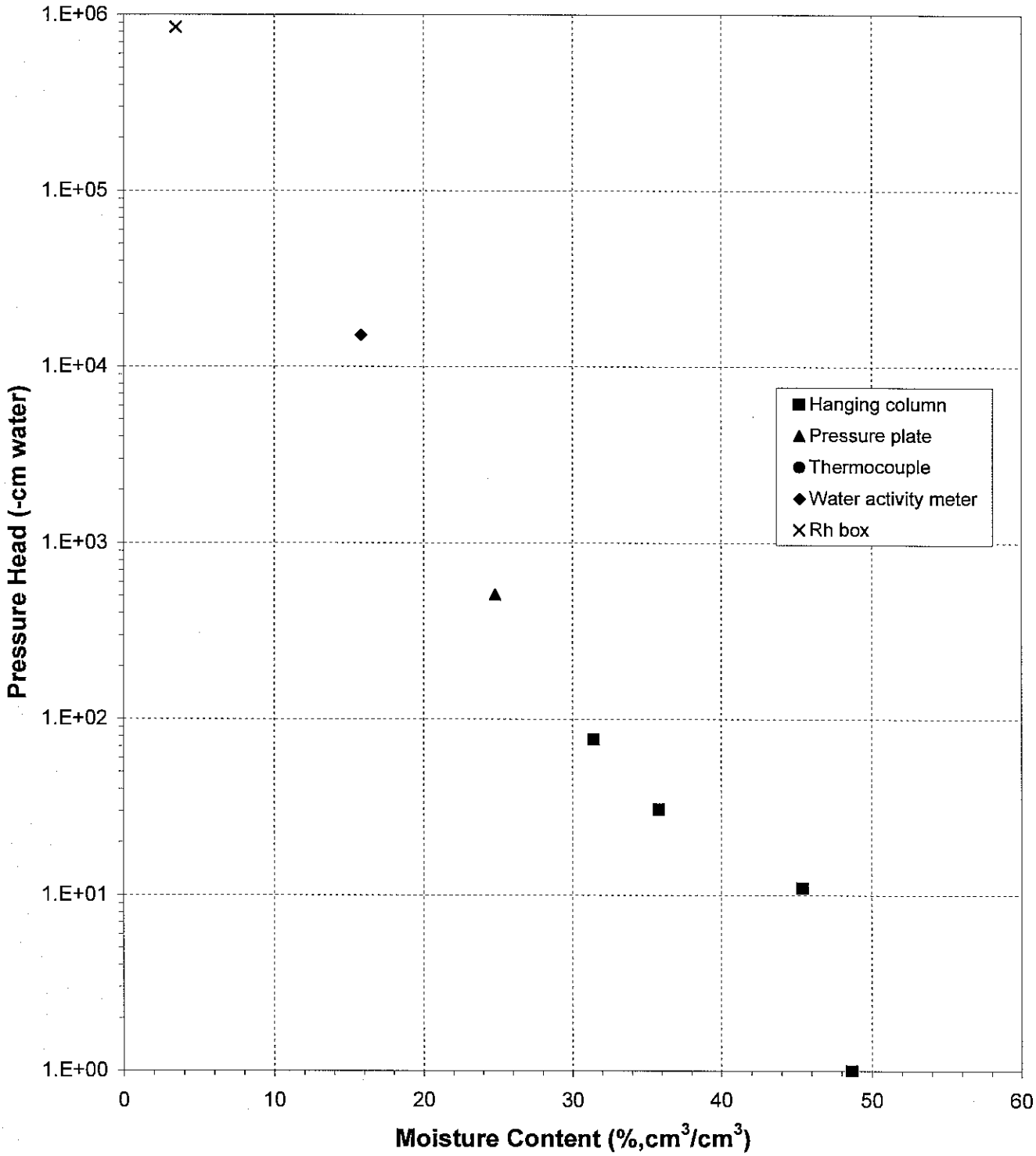
* Weight including tares

† Assumed density of water is 1.0 g/cm^3

Laboratory analysis by: M. Carrillo/S. Shannon
Data entered by: M. Devine
Checked by: J. Hines

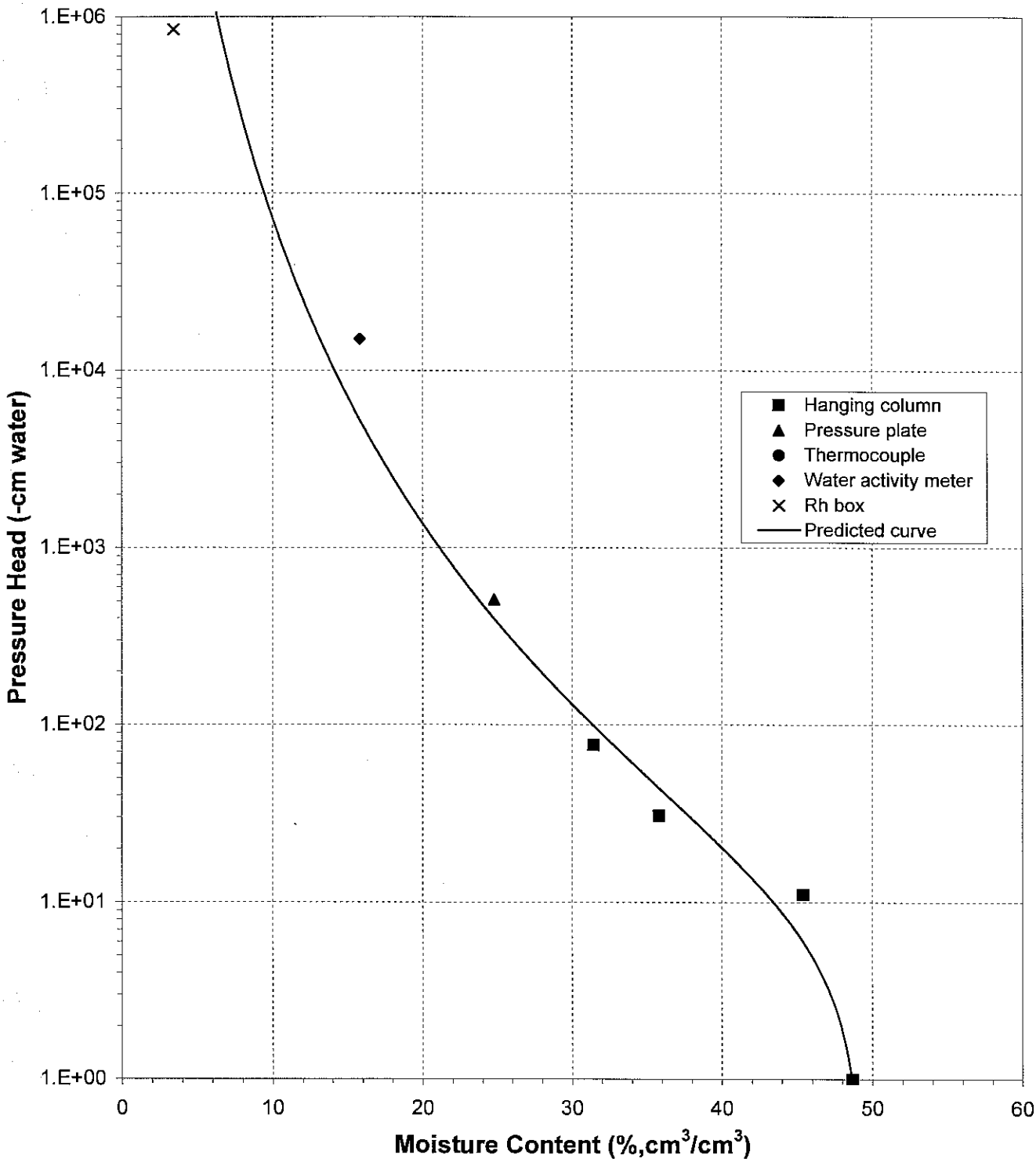
Water Retention Data Points

Sample Number: Test Plot 3C (0-2')



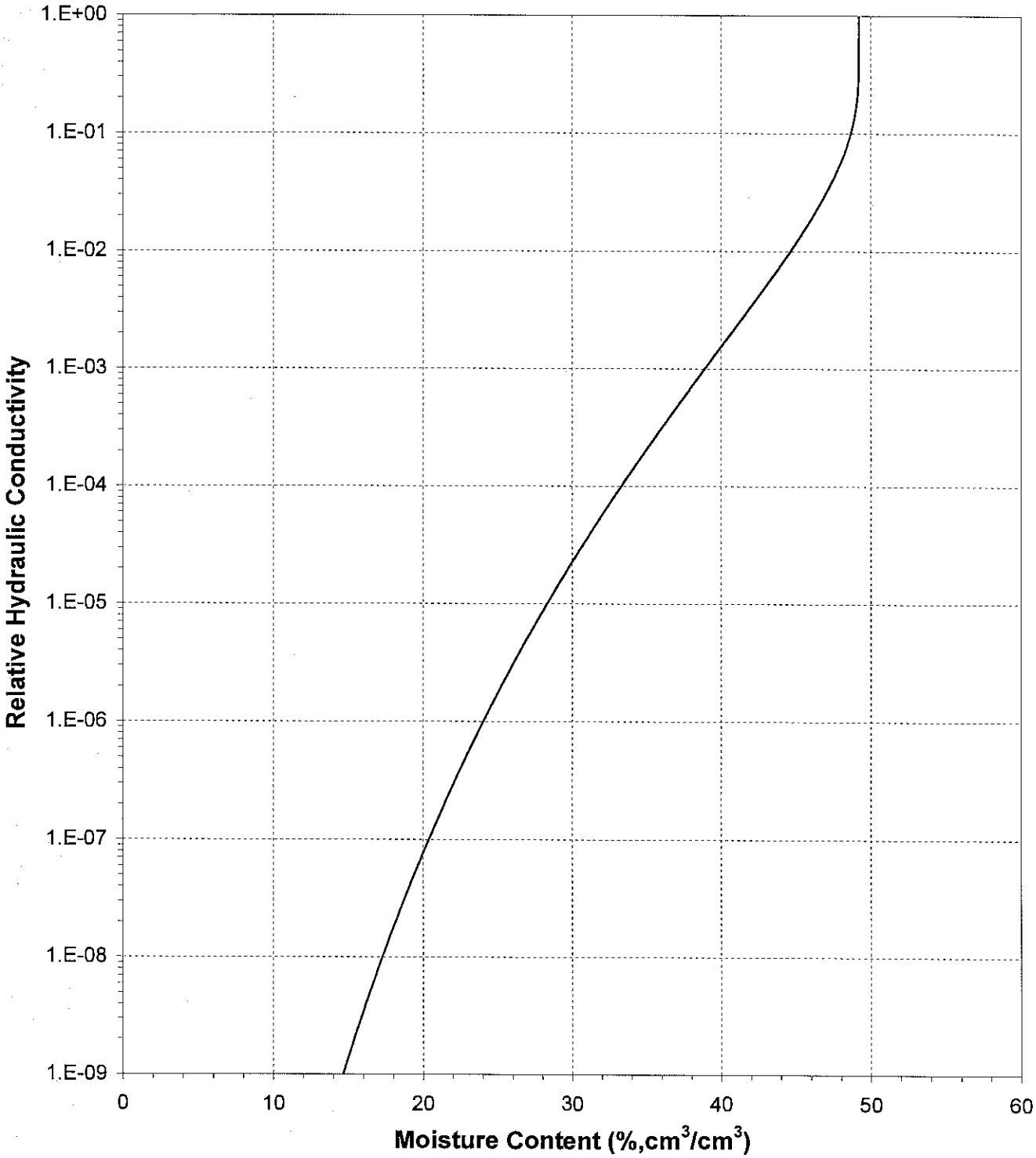
Predicted Water Retention Curve and Data Points

Sample Number: Test Plot 3C (0-2')



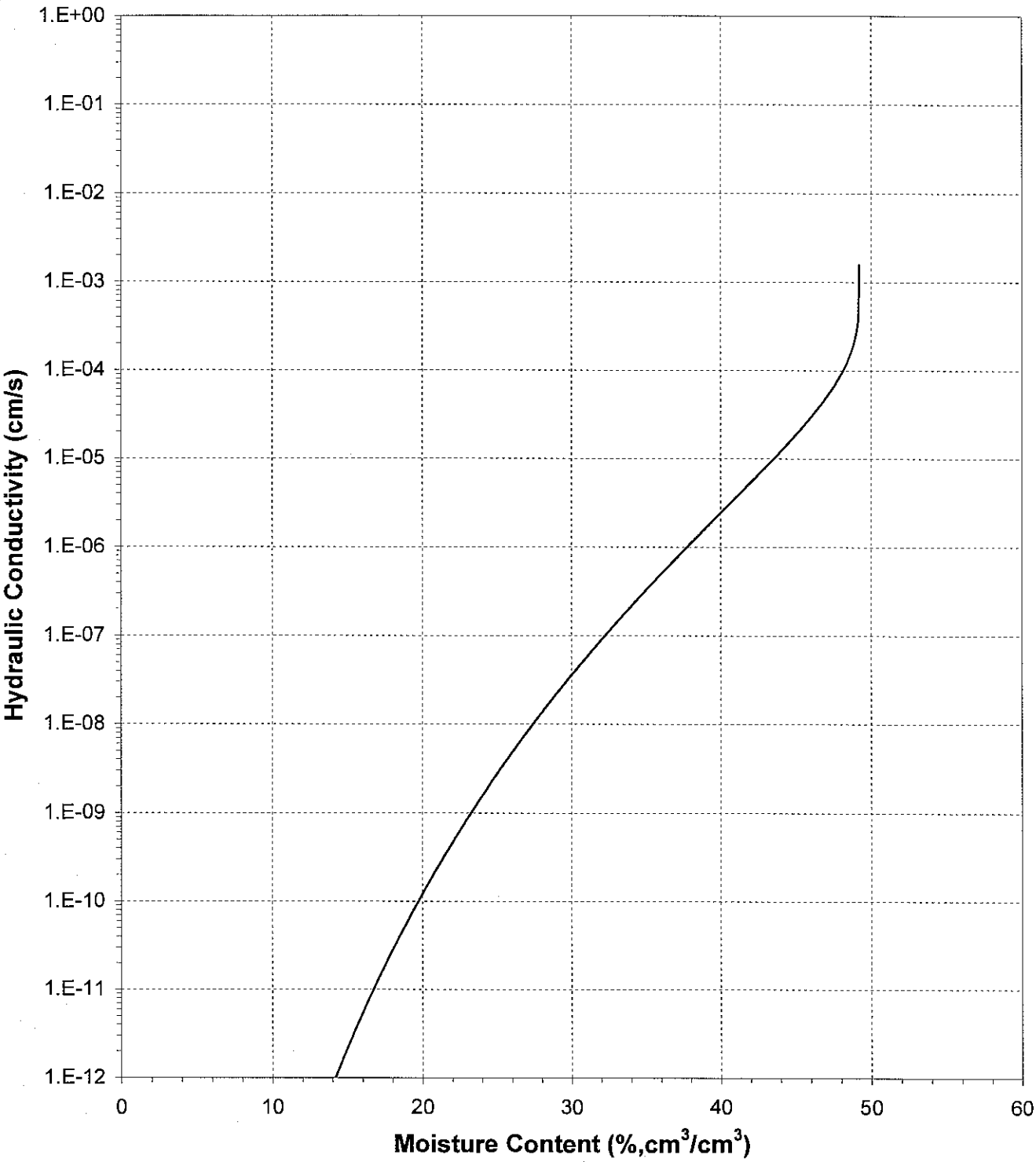
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: Test Plot 3C (0-2')



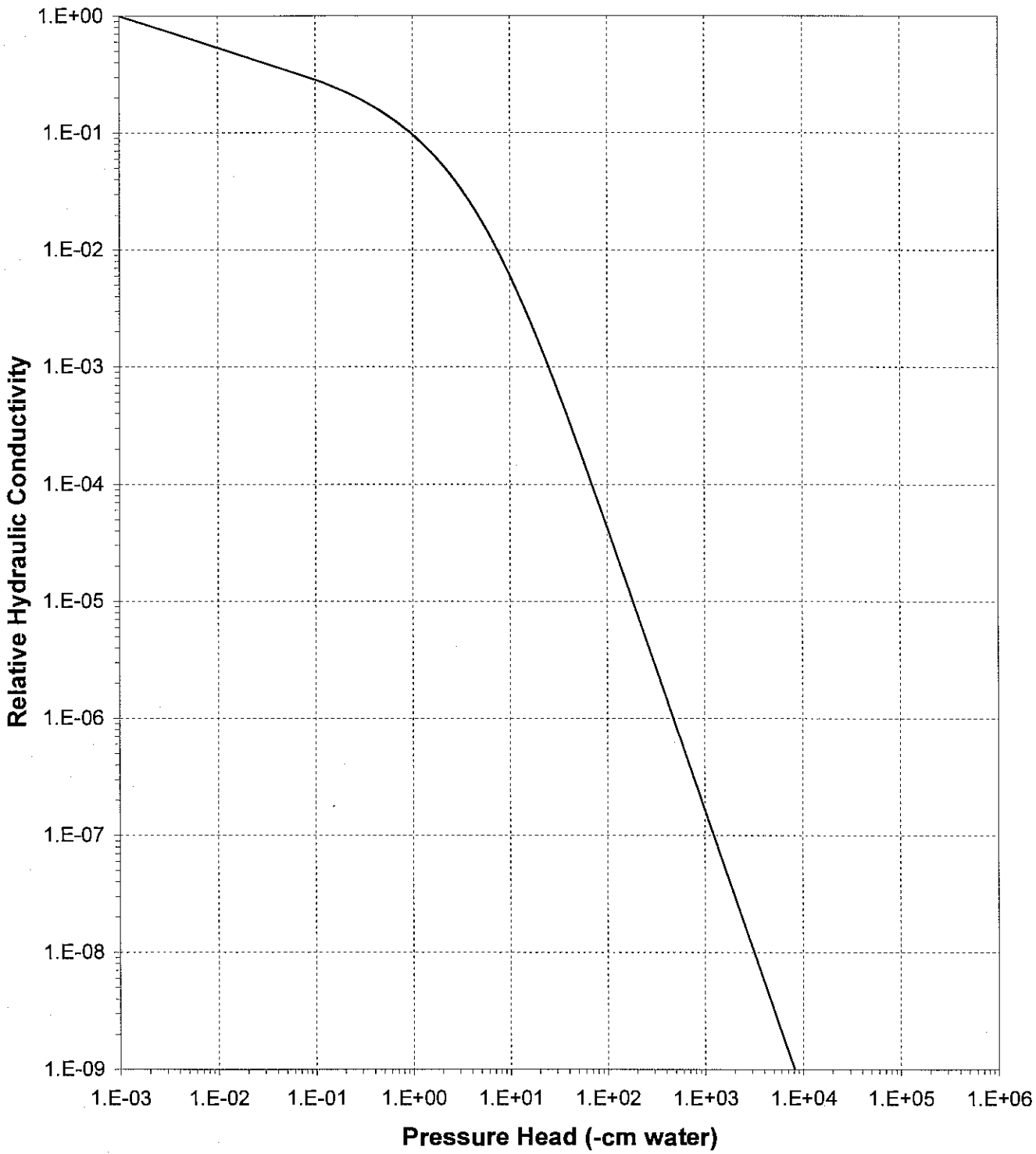
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: Test Plot 3C (0-2')



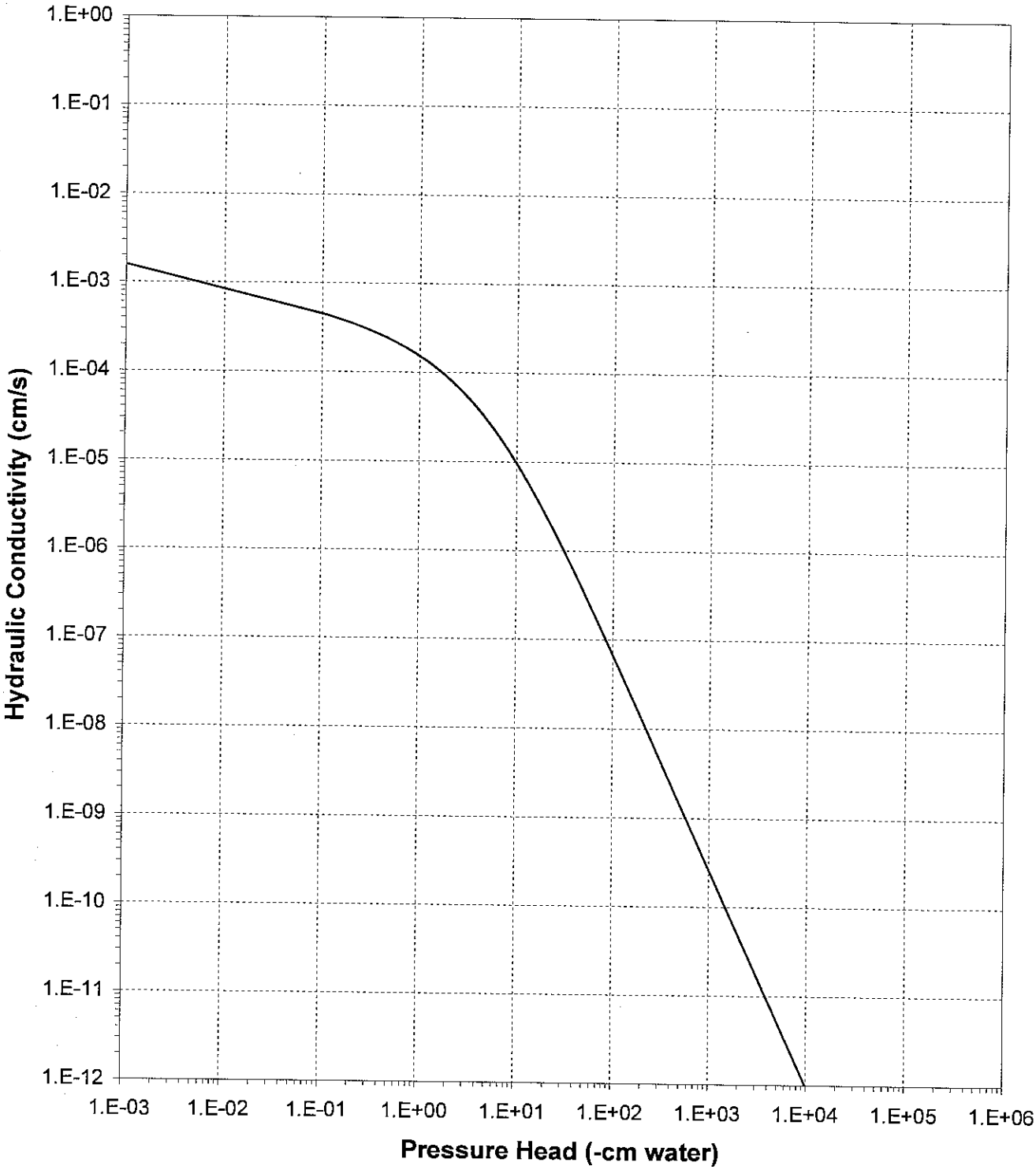
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: Test Plot 3C (0-2')



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: Test Plot 3C (0-2')



Moisture Retention Data

Hanging Column/Pressure Plate/Thermocouple

(Main Drainage Curve)

Job Name:	Golder	*Dry wt. of sample* (g):	193.10
Job Number:	LB05.0119.00	*Tare wt., screen & clamp* (g):	24.86
Sample Number:	Test Plot 3C (2-3')	*Tare wt., ring* (g):	121.52
Ring Number:	NA	*Tare wt., epoxy* (g):	0.00
Depth:	NA	*Sample volume* (cm^3):	139.54

Saturated weight at 0 cm tension* (g): 408.96
Volume of water[T] in saturated sample (cm^3): 69.48
Saturated moisture content (% vol): 49.79
Sample bulk density (g/cm^3): 1.38

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content[T] (% vol)
Hanging column:	09-Jun-05 / 15:40	408.96	0.00	49.79
	14-Jun-05 / 11:00	401.16	9.00	44.20
	20-Jun-05 / 14:12	389.87	31.00	36.11
	27-Jun-05 / 15:50	384.35	76.00	32.16
Pressure plate:	03-Jul-05 / 10:25	375.11	509.90	25.53

Comments:

* Weight including tares
[1] Assumed density of water is 1.0 g/cm^3

Laboratory analysis by: T. Bowekaty
Data entered by: M. Devine
Checked by: J. Hines

Moisture Retention Data

Water Activity Meter/Relative Humidity Box

(Main Drainage Curve)

Job Name: Golder
Job Number: LB05.0119.00
Sample Number: Test Plot 3C (2-3')
Ring Number: NA
Depth: NA

Dry weight of water activity meter sample* (g): 149.62
Tare weight, jar (g): 113.38
Sample bulk density (g/cm^3): 1.38

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Water Activity Meter:	21-Jun-05 / 12:20	153.08	16520.8	13.21

Dry weight of relative humidity box sample* (g): 73.23
Tare weight (g): 40.66
Sample bulk density (g/cm^3): 1.38

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Relative humidity box:	20-Jun-05 / 14:20	74.02	851293	3.38

Comments:

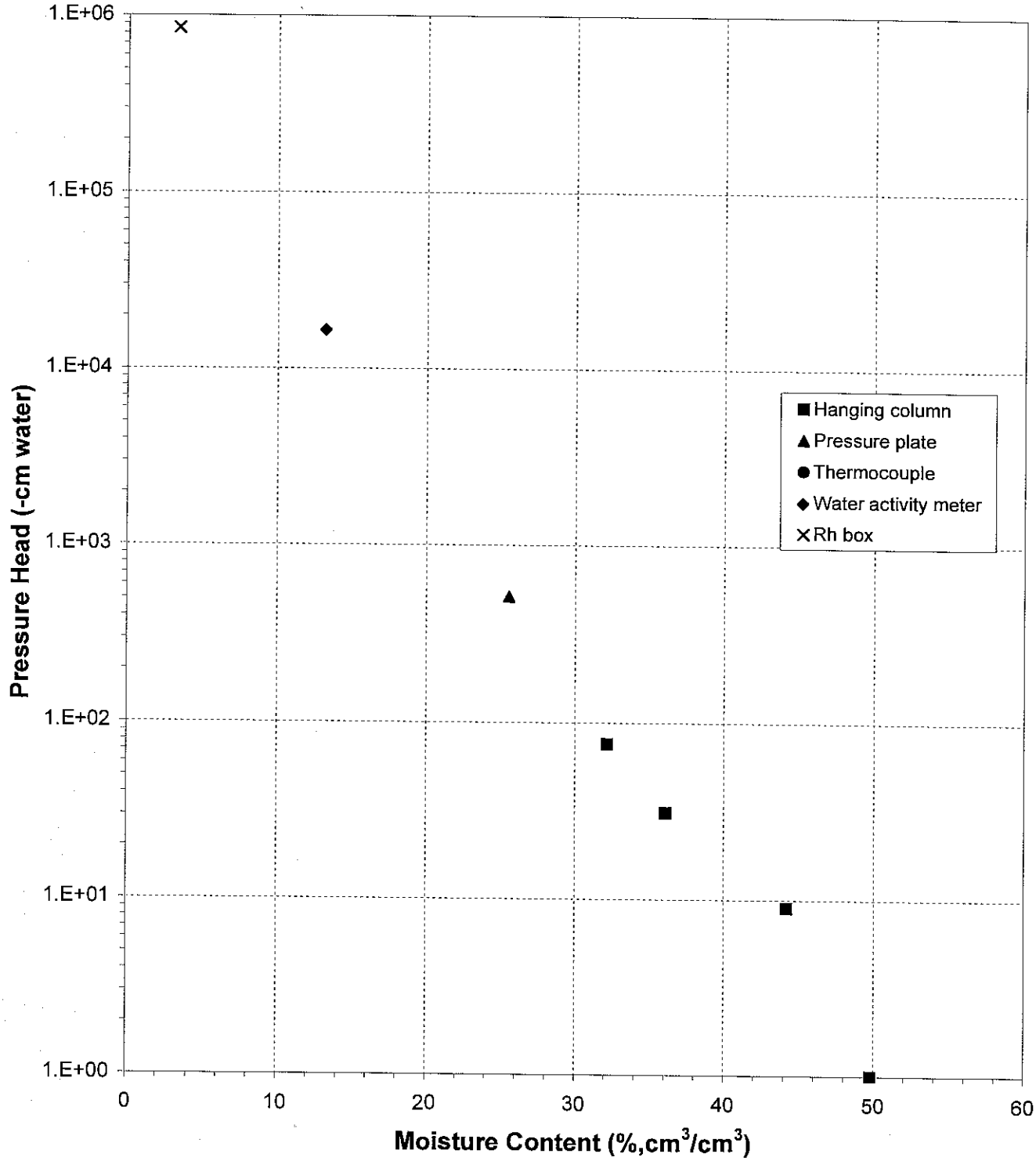
* Weight including tares

† Assumed density of water is 1.0 g/cm^3

Laboratory analysis by: D. O'Dowd/S. Shannon
Data entered by: M. Devine
Checked by: J. Hines

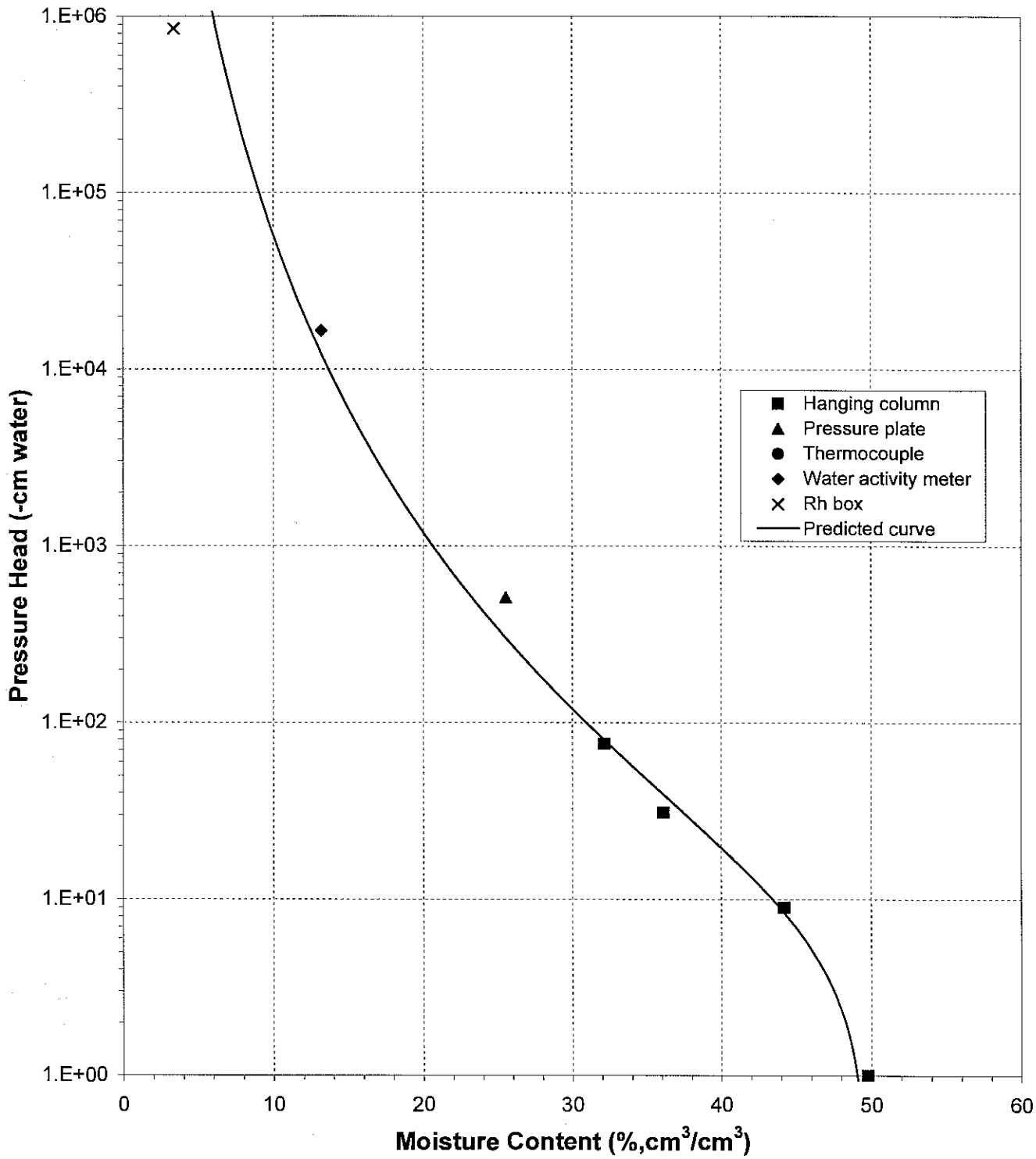
Water Retention Data Points

Sample Number: Test Plot 3C (2-3')



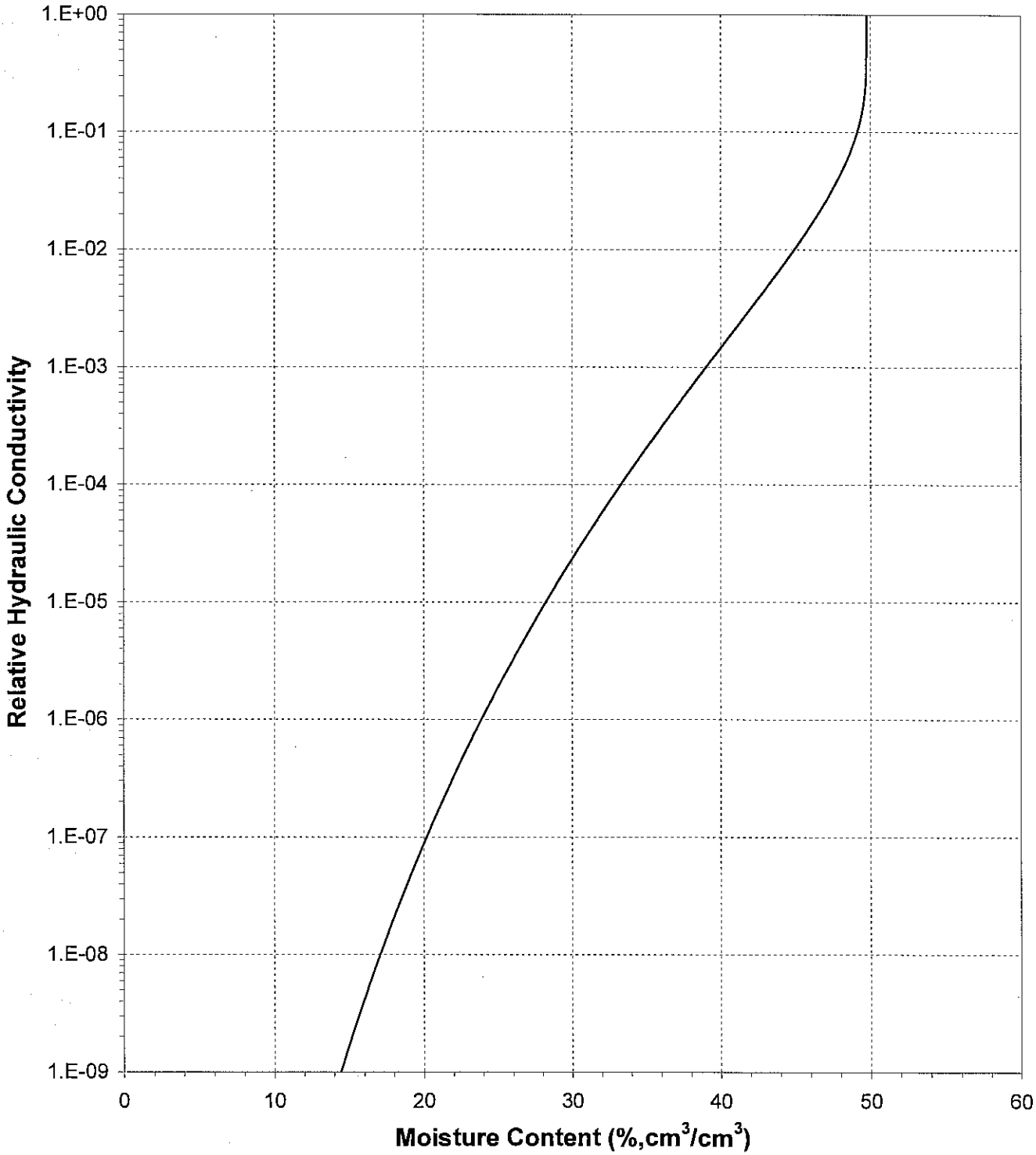
Predicted Water Retention Curve and Data Points

Sample Number: Test Plot 3C (2-3')



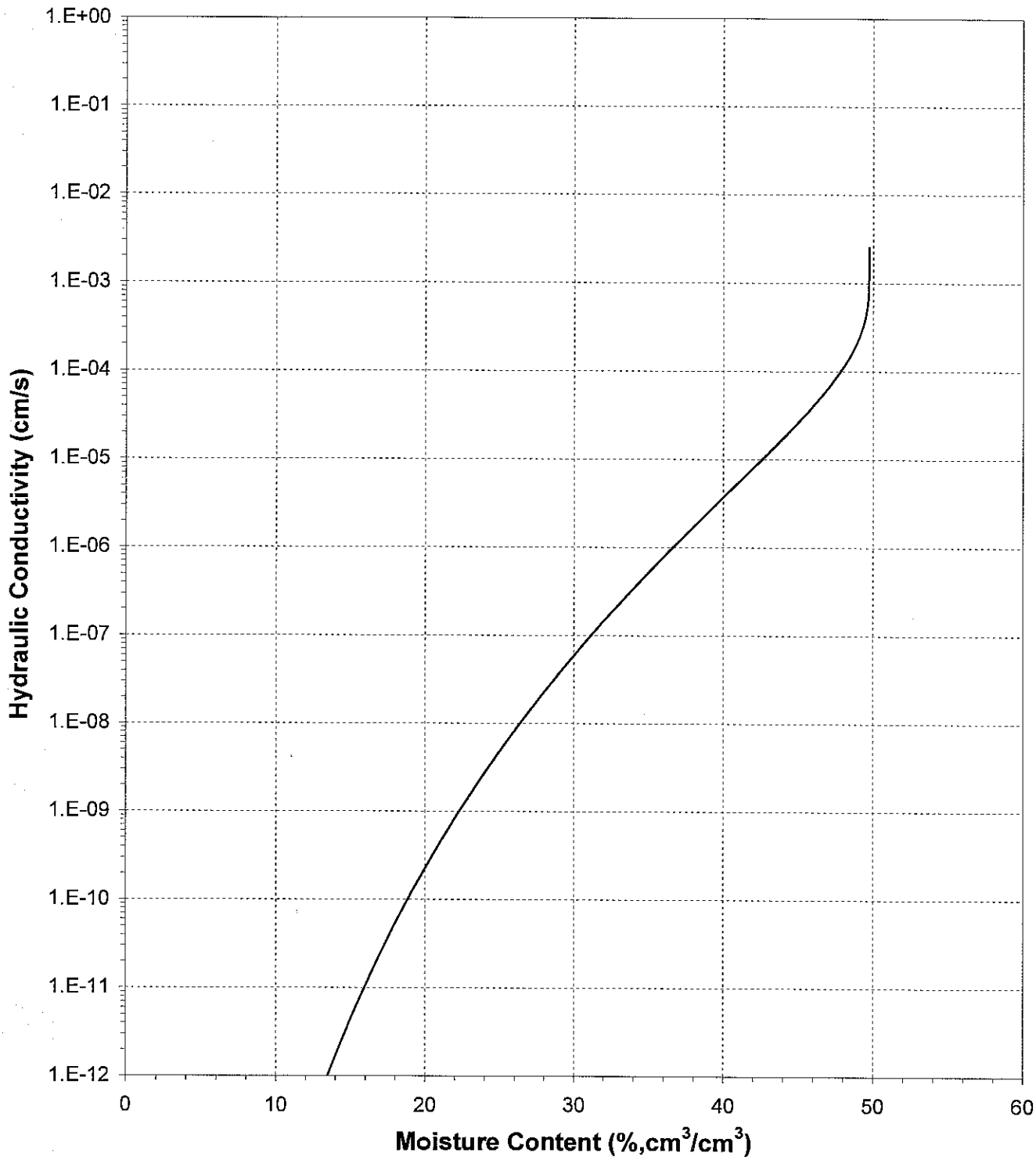
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: Test Plot 3C (2-3')



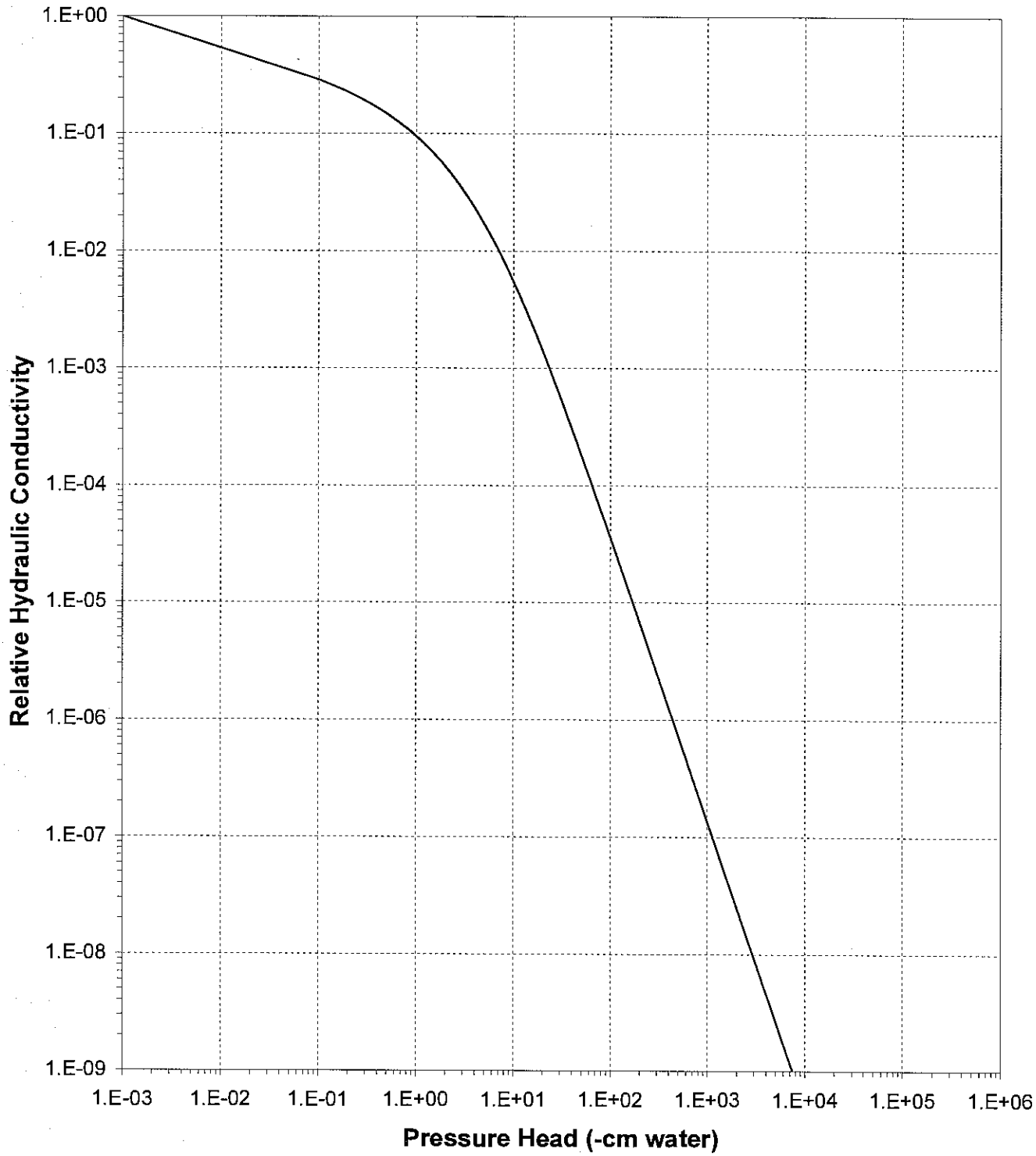
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: Test Plot 3C (2-3')



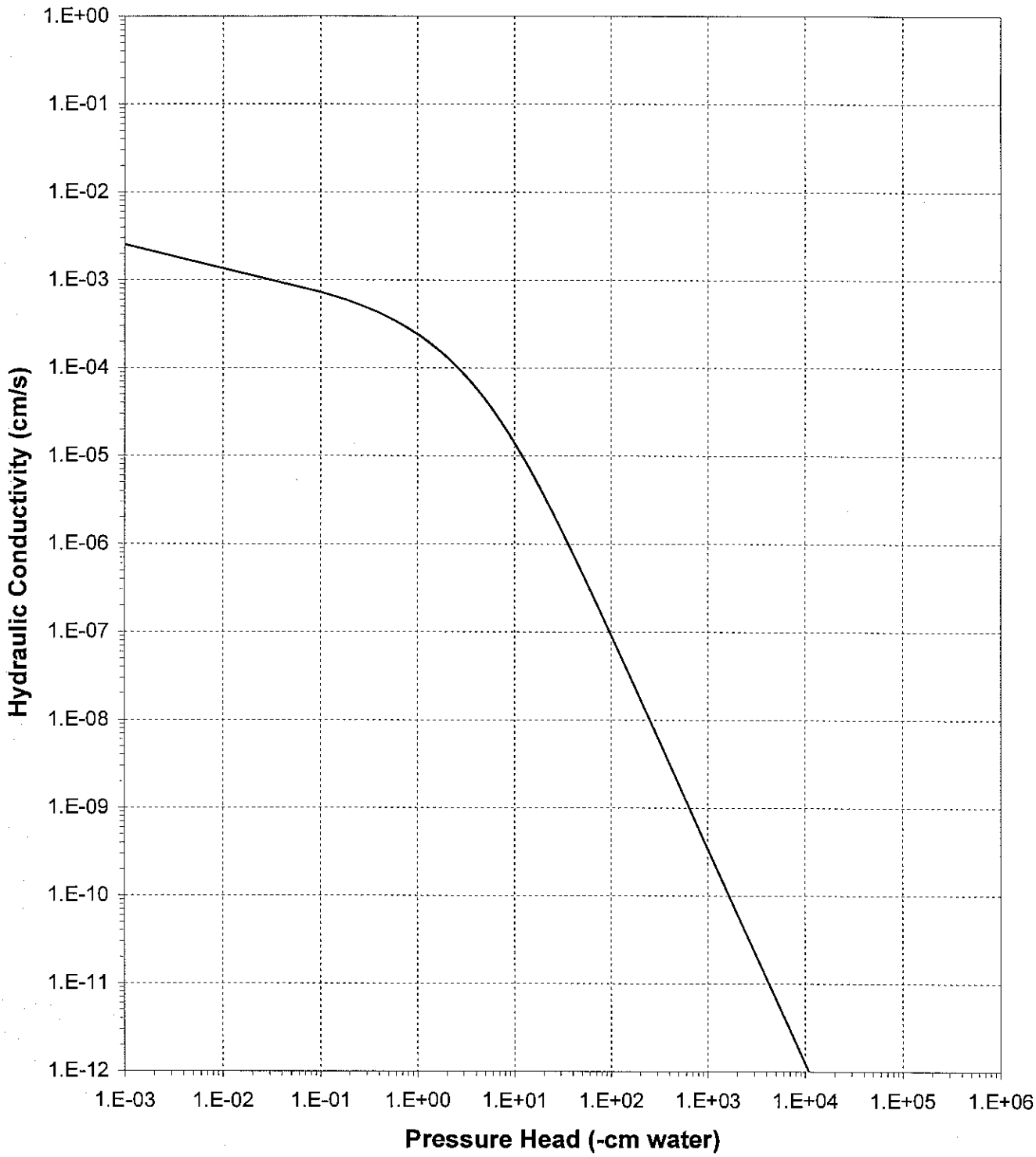
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: Test Plot 3C (2-3')



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: Test Plot 3C (2-3')



Moisture Retention Data

Hanging Column/Pressure Plate/Thermocouple

(Main Drainage Curve)

Job Name:	Golder	*Dry wt. of sample* (g):	196.07
Job Number:	LB05.0119.00	*Tare wt., screen & clamp* (g):	25.51
Sample Number:	Test Plot 5A (3-4')	*Tare wt., ring* (g):	121.92
Ring Number:	NA	*Tare wt., epoxy* (g):	0.00
Depth:	NA	*Sample volume* (cm^3):	140.19

Saturated weight at 0 cm tension* (g): 408.36
Volume of water[T] in saturated sample (cm^3): 64.86
Saturated moisture content (% vol): 46.23
Sample bulk density (g/cm^3): 1.40

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content[T] (% vol)
Hanging column:	13-Jun-05 / 10:15	408.31	0.00	46.23
	20-Jun-05 / 13:15	397.74	22.20	38.69
	27-Jun-05 / 13:50	391.49	51.00	34.23
	03-Jul-05 / 10:50	386.60	124.00	30.75
Pressure plate:	09-Jul-05 / 11:45	379.47	509.90	25.66

Comments:

* Weight including tares
[I] Assumed density of water is 1.0 g/cm^3

Laboratory analysis by: M. Carrillo
Data entered by: D. O'Dowd
Checked by: J. Hines

Moisture Retention Data

Water Activity Meter/Relative Humidity Box

(Main Drainage Curve)

Job Name: Golder
Job Number: LB05.0119.00
Sample Number: Test Plot 5A (3-4')
Ring Number: NA
Depth: NA

Dry weight of water activity meter sample* (g): 135.88
Tare weight, jar (g): 112.63
Sample bulk density (g/cm^3): 1.40

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content^T (% vol)
Water Activity Meter:	21-Jun-05 / 13:05	137.85	16520.8	11.85

Dry weight of relative humidity box sample* (g): 71.49
Tare weight (g): 36.88
Sample bulk density (g/cm^3): 1.40

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content^T (% vol)
Relative humidity box:	20-Jun-05 / 14:20	72.21	851293	2.92

Comments:

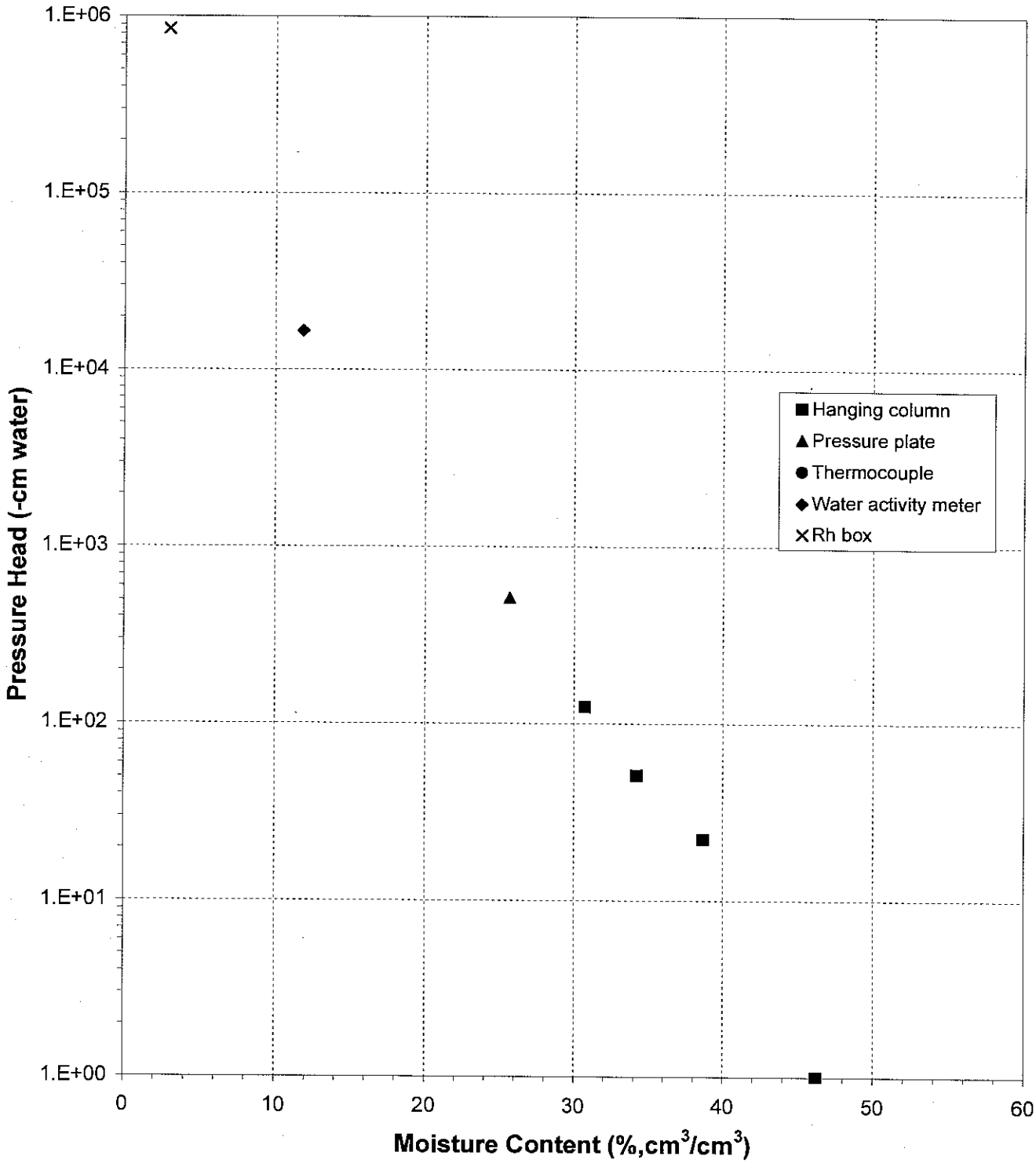
* Weight including tares

^{T} Assumed density of water is 1.0 g/cm^3

Laboratory analysis by: D. O'Dowd/S. Shannon
Data entered by: D. O'Dowd
Checked by: J. Hines

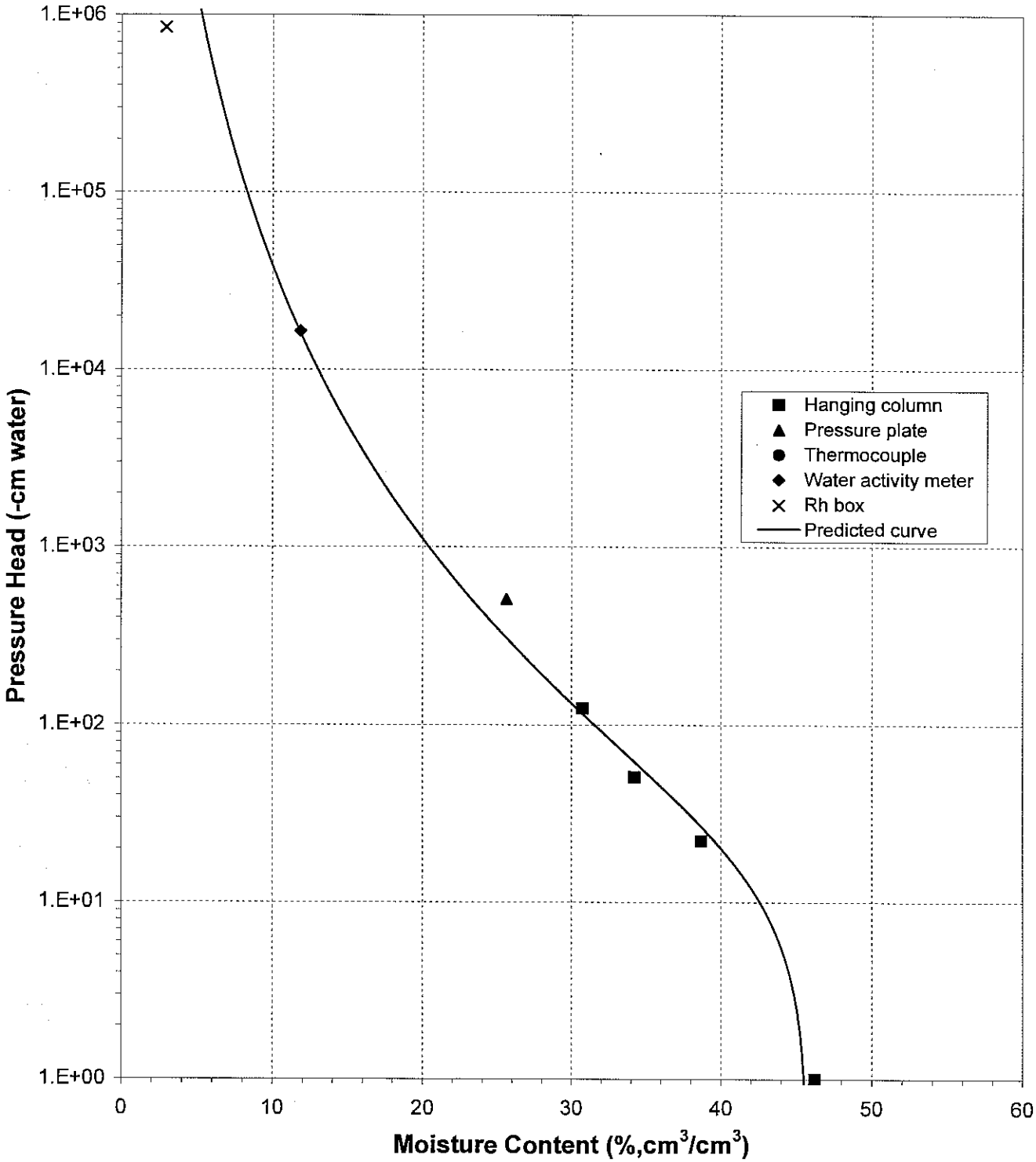
Water Retention Data Points

Sample Number: Test Plot 5A (3-4')



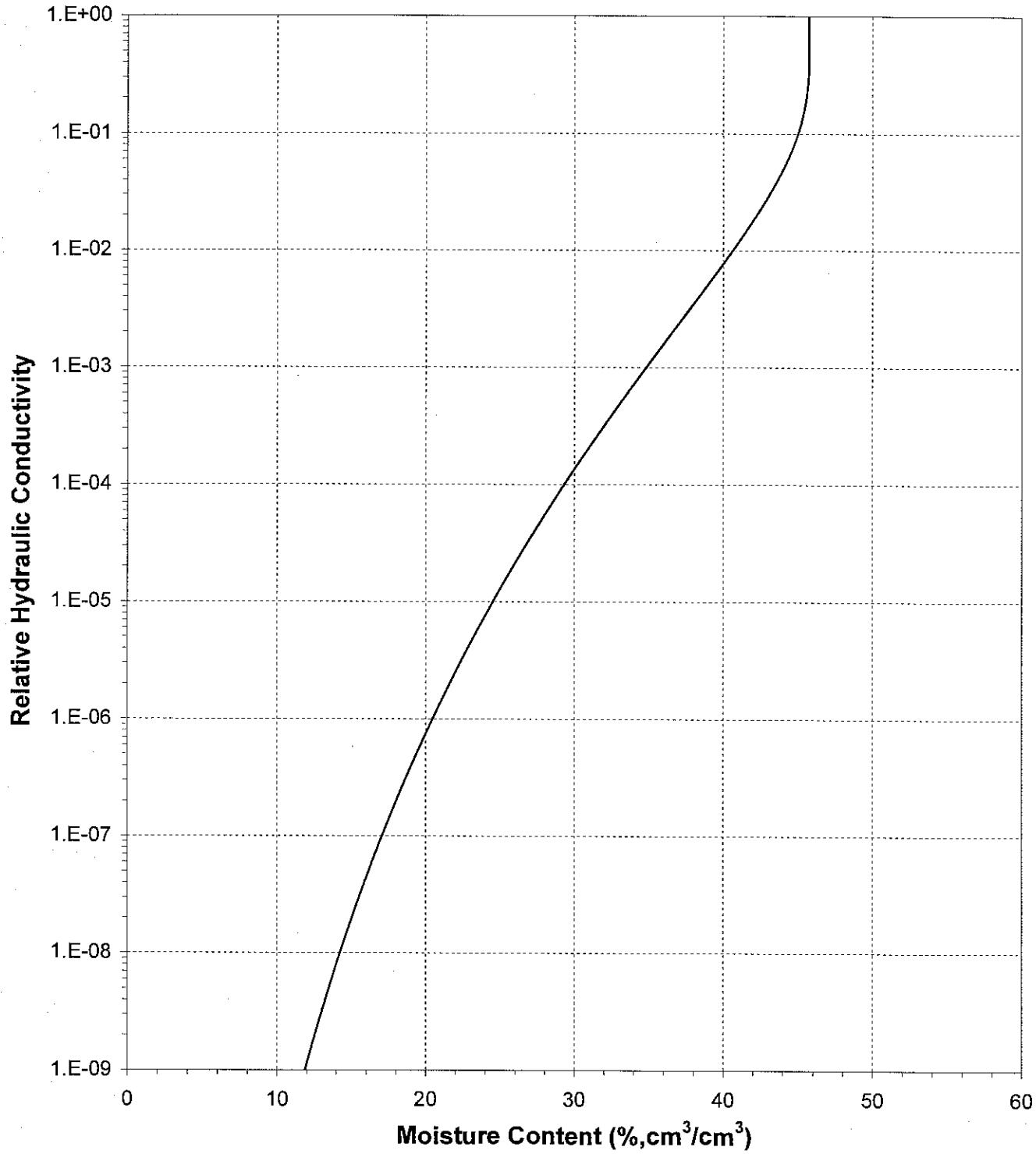
Predicted Water Retention Curve and Data Points

Sample Number: Test Plot 5A (3-4')



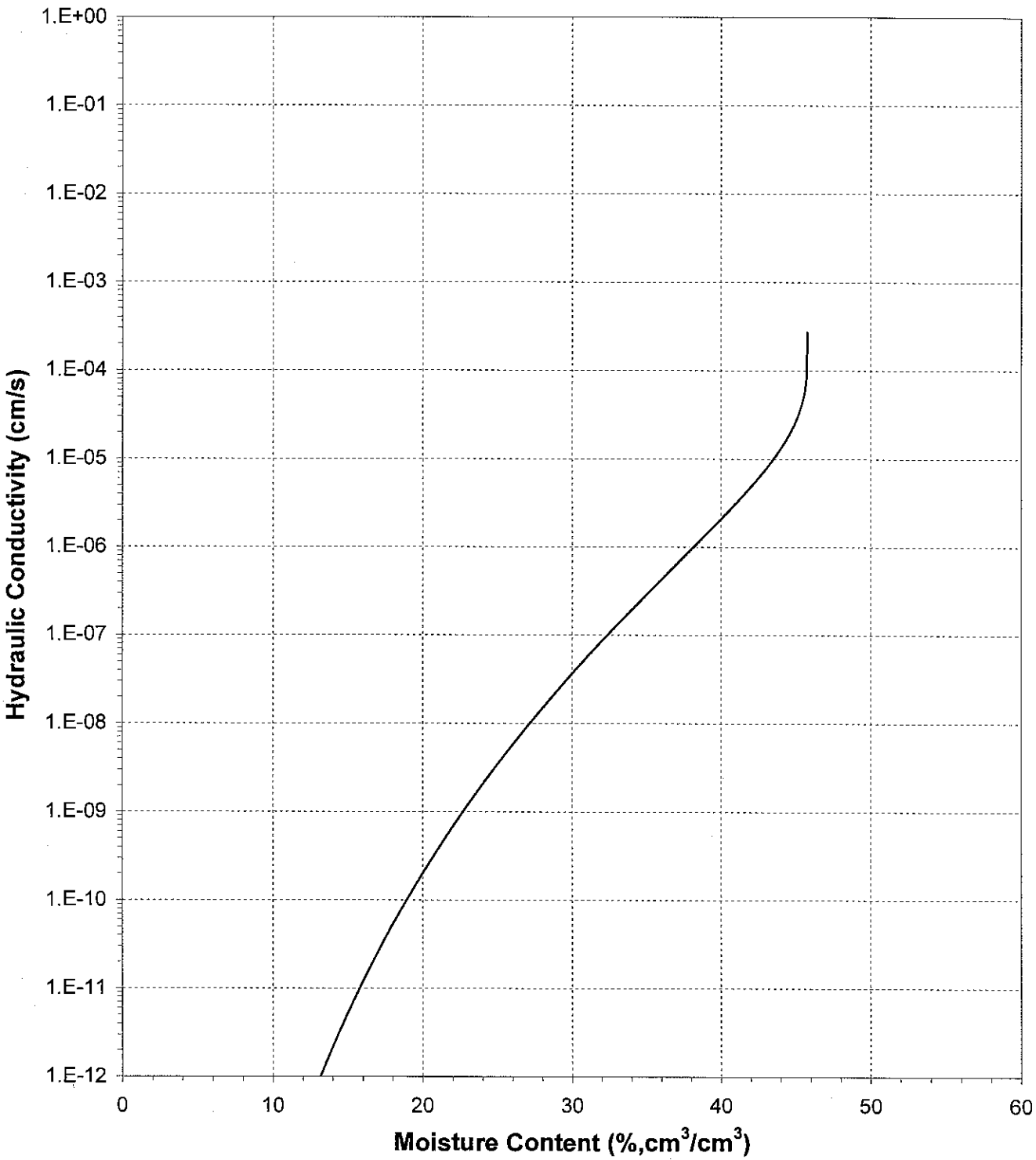
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: Test Plot 5A (3-4')



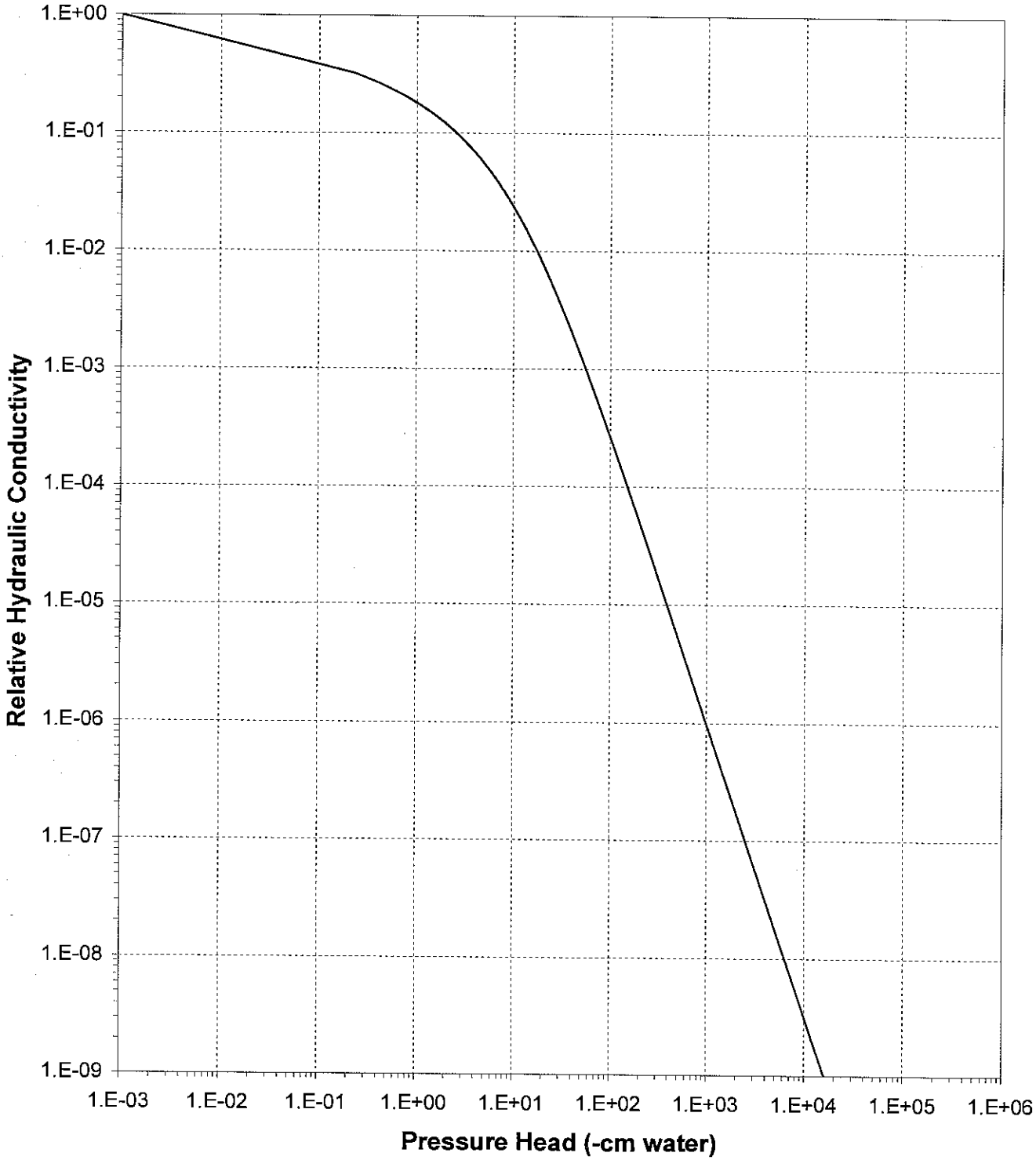
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: Test Plot 5A (3-4')



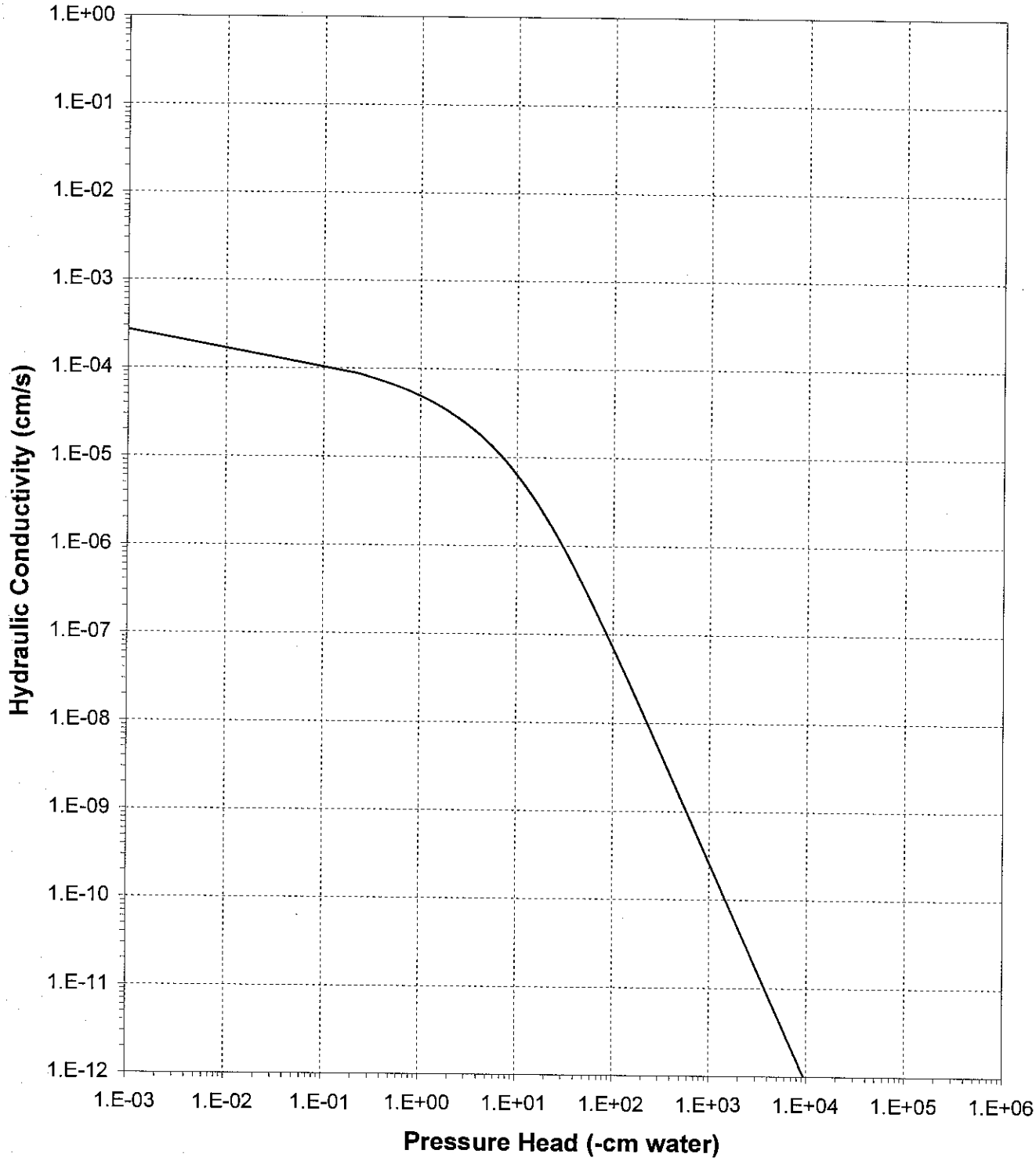
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: Test Plot 5A (3-4')



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: Test Plot 5A (3-4')



Moisture Retention Data

Hanging Column/Pressure Plate/Thermocouple

(Main Drainage Curve)

Job Name: Golder
Job Number: LB05.0119.00
Sample Number: Test Plot 7A (0-2')
Ring Number: NA
Depth: NA

Dry wt. of sample (g): 196.76
Tare wt., screen & clamp (g): 24.78
Tare wt., ring (g): 116.03
Tare wt., epoxy (g): 0.00
Sample volume (cm^3): 140.71

Saturated weight at 0 cm tension* (g): 401.75
Volume of water[T] in saturated sample (cm^3): 64.18
Saturated moisture content (% vol): 45.61
Sample bulk density (g/cm^3): 1.40

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content[T] (% vol)
Hanging column:	13-Jun-05 / 14:36	401.75	0.00	45.61
	20-Jun-05 / 13:15	393.98	22.20	40.09
	27-Jun-05 / 13:45	387.04	51.00	35.16
	03-Jul-05 / 10:50	381.46	124.00	31.19
Pressure plate:	09-Jul-05 / 11:45	374.93	509.90	26.55

Comments:

* Weight including tares
[T] Assumed density of water is 1.0 g/cm^3

Laboratory analysis by: M. Carrillo
Data entered by: D. O'Dowd
Checked by: J. Hines

Moisture Retention Data

Water Activity Meter/Relative Humidity Box

(Main Drainage Curve)

Job Name: Golder
Job Number: LB05.0119.00
Sample Number: Test Plot 7A (0-2')
Ring Number: NA
Depth: NA

Dry weight of water activity meter sample* (g): 136.72
Tare weight, jar (g): 113.20
Sample bulk density (g/cm^3): 1.40

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content^T (% vol)
Water Activity Meter:	22-Jun-05 / 11:37	139.12	9076.2	14.27

Dry weight of relative humidity box sample* (g): 69.80
Tare weight (g): 39.93
Sample bulk density (g/cm^3): 1.40

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content^T (% vol)
Relative humidity box:	20-Jun-05 / 14:20	70.47	851293	3.11

Comments:

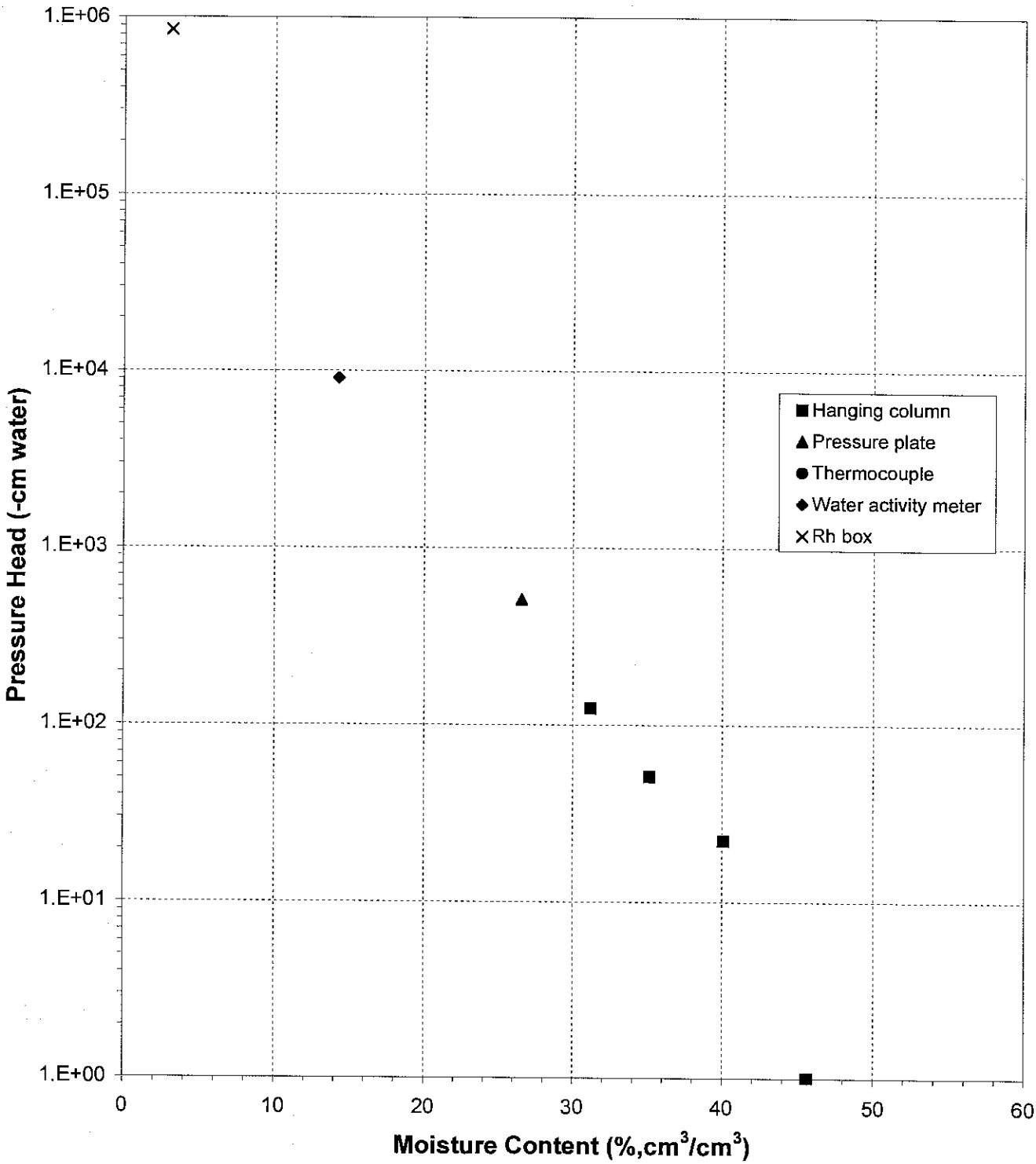
* Weight including tares

† Assumed density of water is 1.0 g/cm^3

Laboratory analysis by: M. Devine/S. Shannon
Data entered by: D. O'Dowd
Checked by: J. Hines

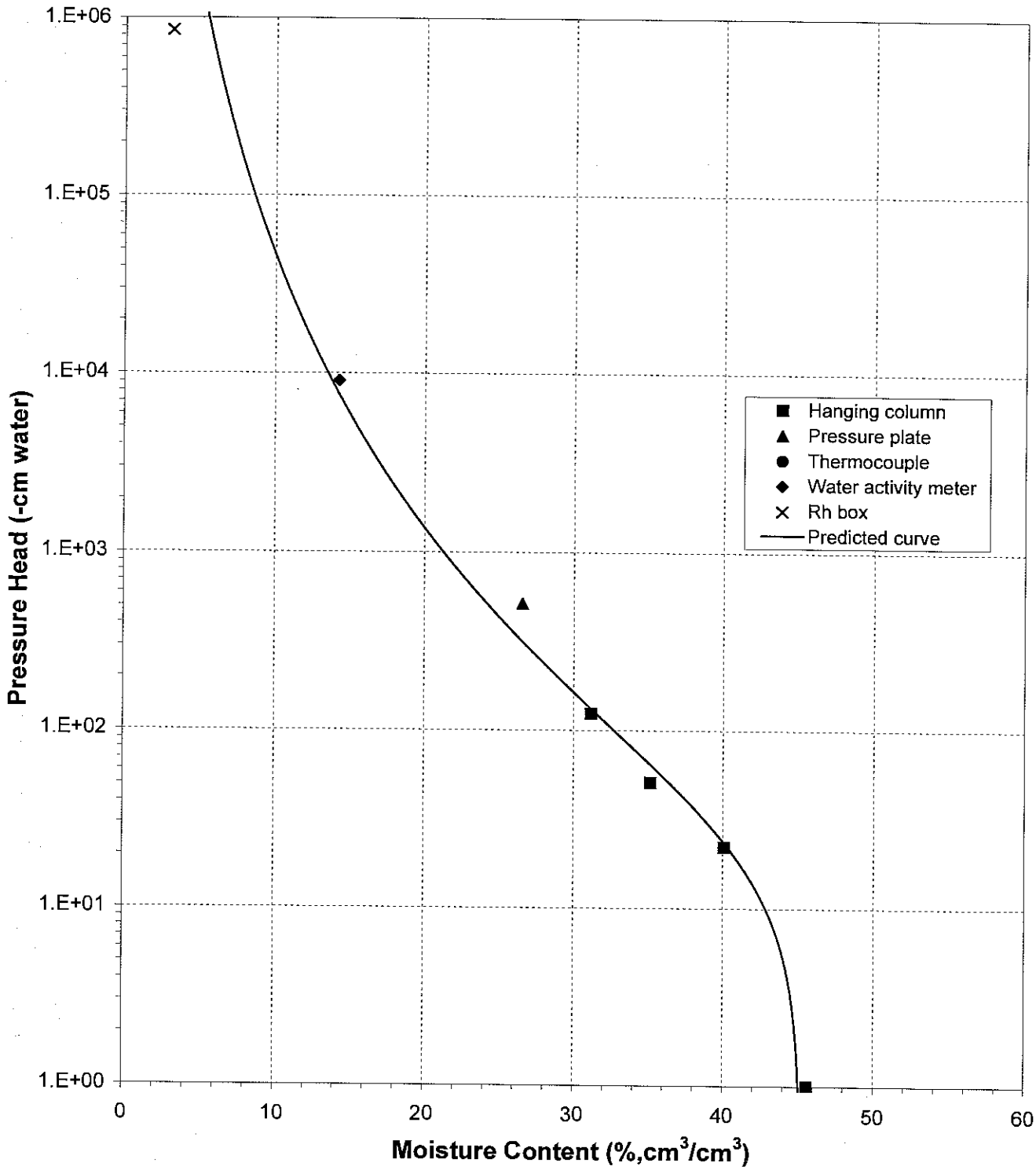
Water Retention Data Points

Sample Number: Test Plot 7A (0-2')



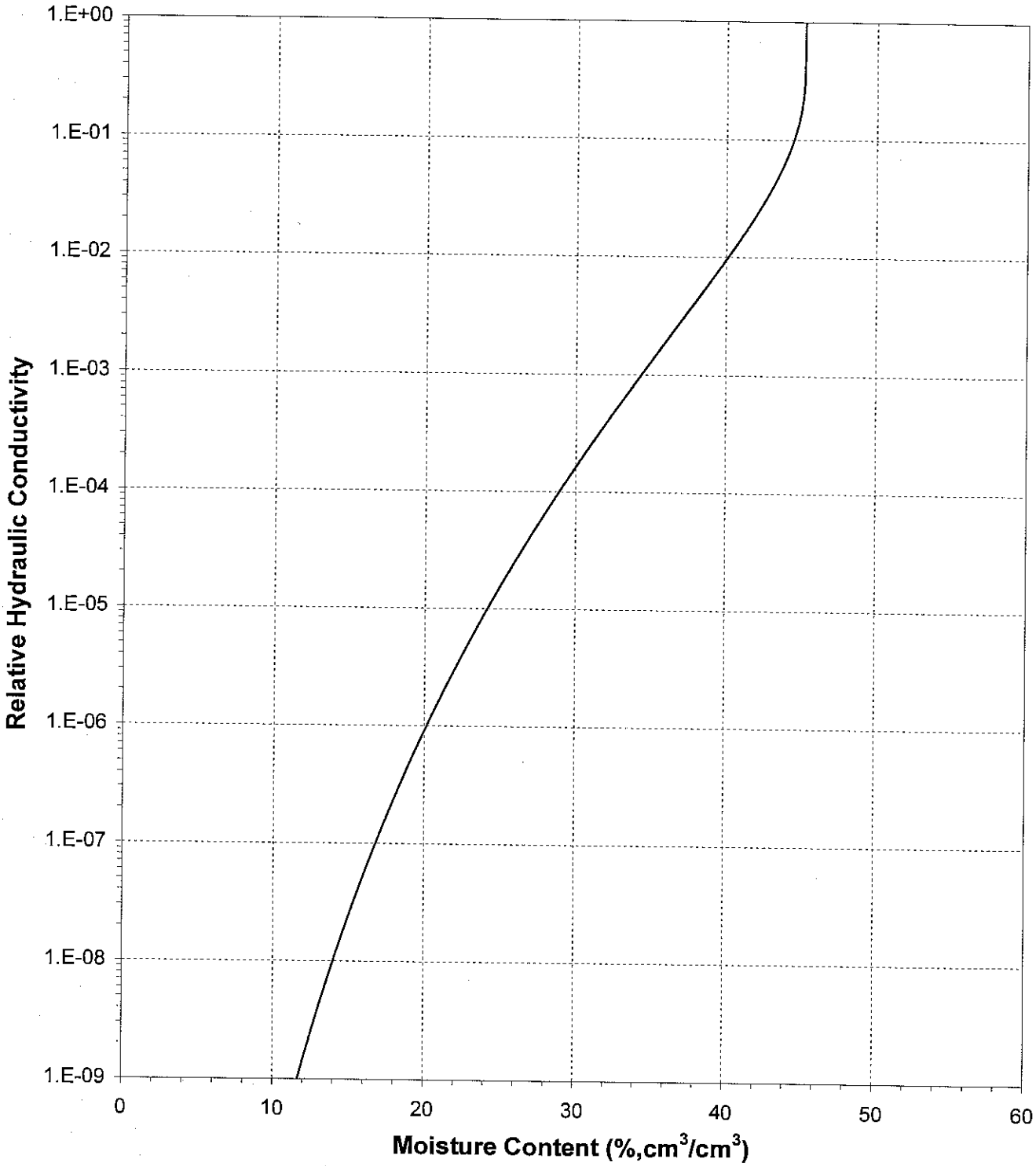
Predicted Water Retention Curve and Data Points

Sample Number: Test Plot 7A (0-2')



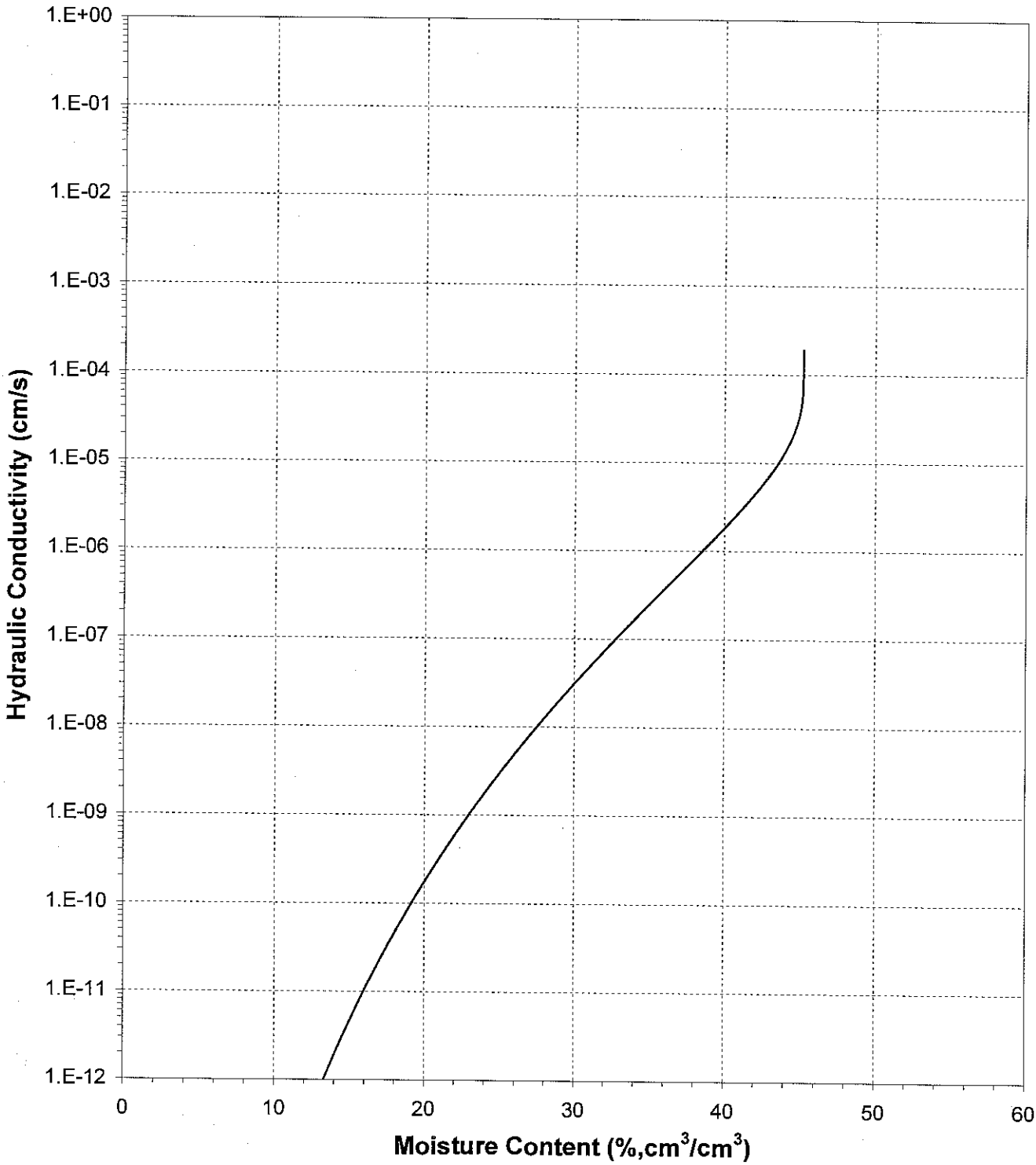
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: Test Plot 7A (0-2')



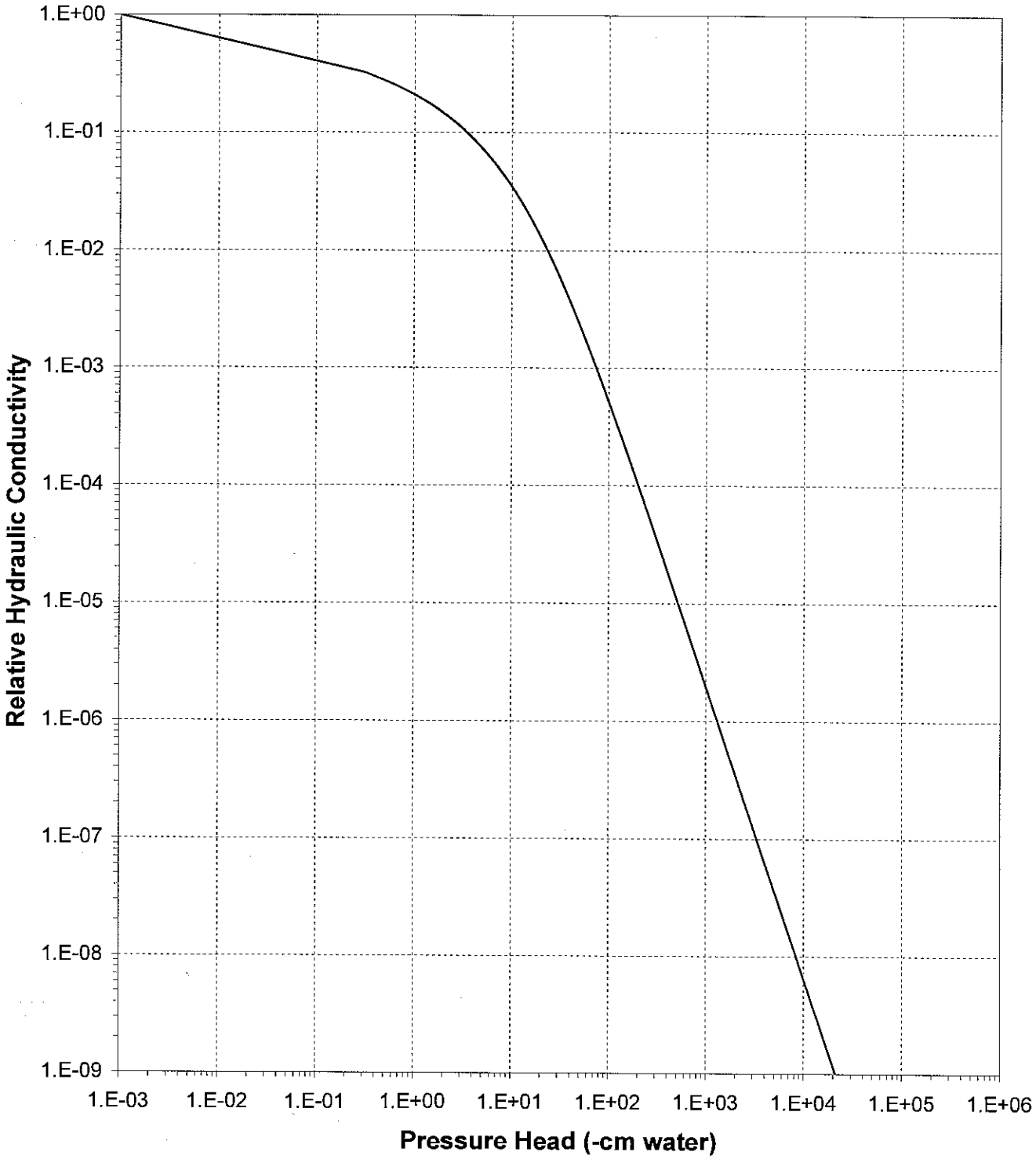
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: Test Plot 7A (0-2')



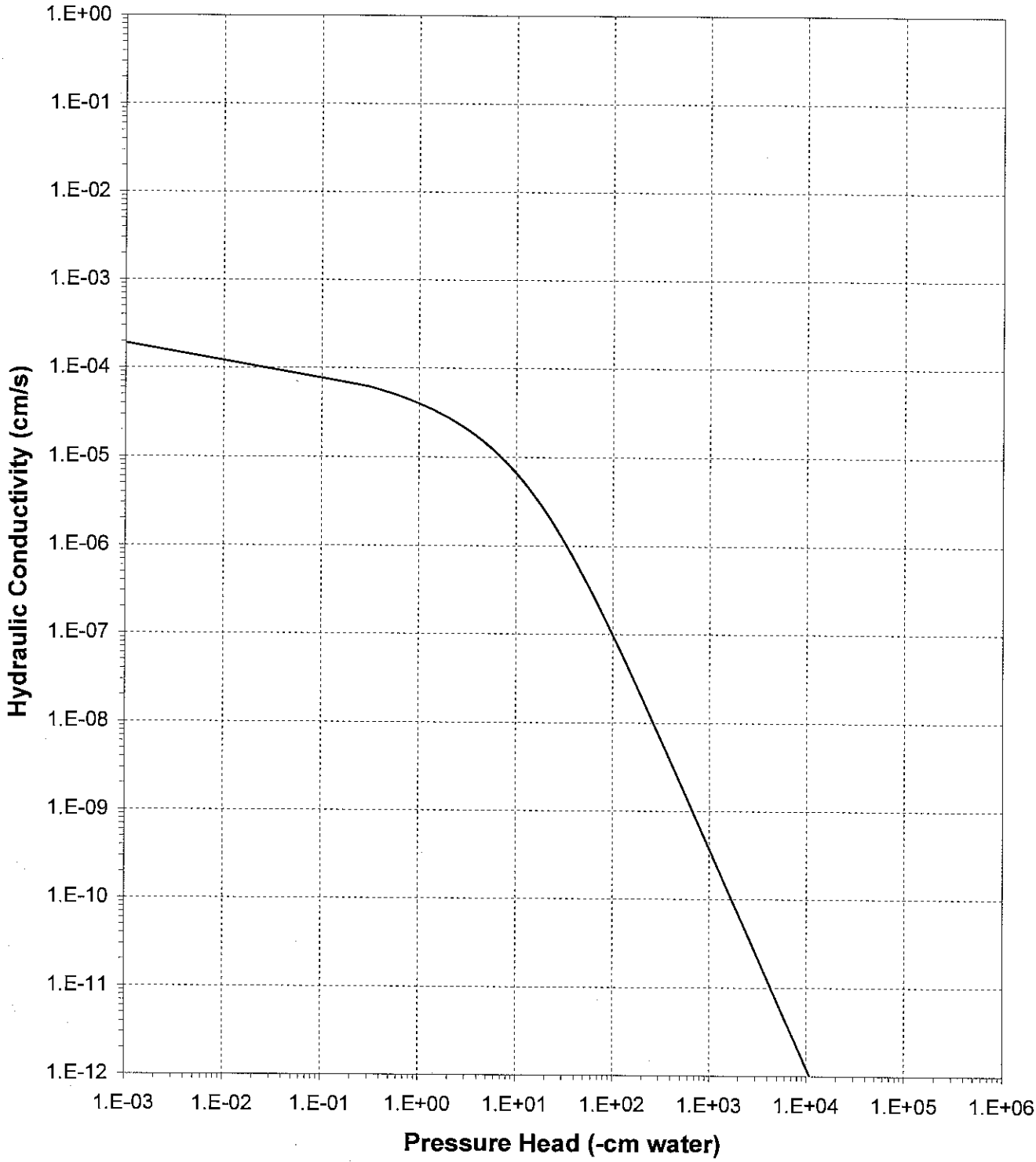
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: Test Plot 7A (0-2')



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: Test Plot 7A (0-2')



Moisture Retention Data

Hanging Column/Pressure Plate/Thermocouple

(Main Drainage Curve)

Job Name:	Golder	*Dry wt. of sample* (g):	198.51
Job Number:	LB05.0119.00	*Tare wt., screen & clamp* (g):	26.02
Sample Number:	Test Plot 10A (6-7')	*Tare wt., ring* (g):	117.48
Ring Number:	NA	*Tare wt., epoxy* (g):	0.00
Depth:	NA	*Sample volume* (cm^3):	140.90

Saturated weight at 0 cm tension* (g): 402.80
Volume of water[T] in saturated sample (cm^3): 60.79
Saturated moisture content (% vol): 43.14
Sample bulk density (g/cm^3): 1.41

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content[T] (% vol)
Hanging column:	10-Jun-05 / 09:25	402.80	0.00	43.14
	17-Jun-05 / 09:50	393.25	25.00	36.37
	23-Jun-05 / 09:50	387.07	52.00	31.98
	30-Jun-05 / 13:10	381.26	144.30	27.86
Pressure plate:	06-Jul-05 / 09:20	376.55	509.90	24.51

Comments:

* Weight including tares
[T] Assumed density of water is 1.0 g/cm^3

Laboratory analysis by: T. Bowekaty
Data entered by: M. Devine
Checked by: J. Hines

Moisture Retention Data

Water Activity Meter/Relative Humidity Box

(Main Drainage Curve)

Job Name: Golder
Job Number: LB05.0119.00
Sample Number: Test Plot 10A (6-7')
Ring Number: NA
Depth: NA

Dry weight of water activity meter sample* (g): 141.31
Tare weight, jar (g): 112.79
Sample bulk density (g/cm^3): 1.41

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Water Activity Meter:	21-Jun-05 / 15:55	143.85	17030.7	12.55

Dry weight of relative humidity box sample* (g): 77.52
Tare weight (g): 41.62
Sample bulk density (g/cm^3): 1.41

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Relative humidity box:	20-Jun-05 / 14:20	78.18	851293	2.61

Comments:

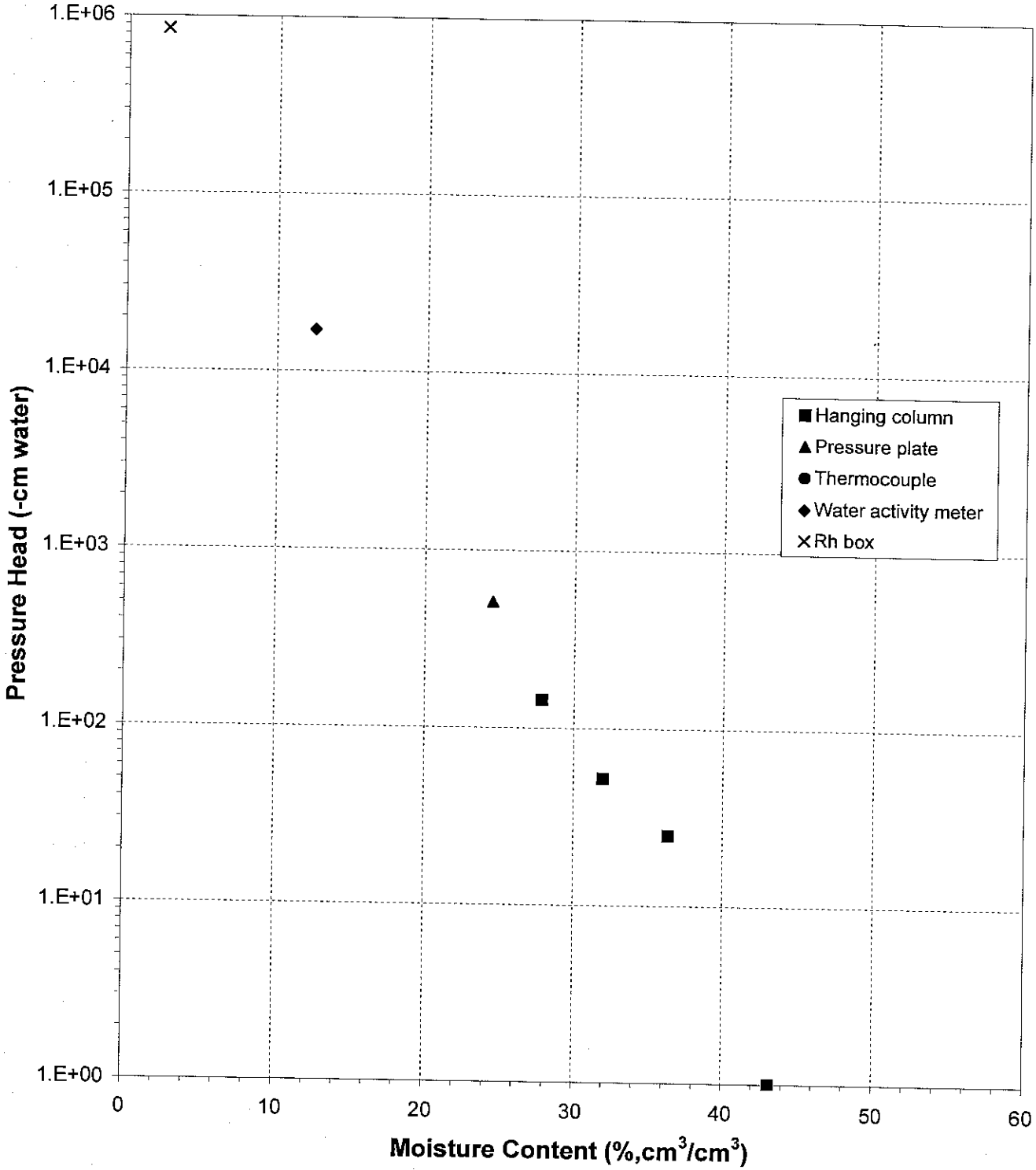
* Weight including tares

† Assumed density of water is 1.0 g/cm^3

Laboratory analysis by: M. Carrillo/S. Shannon
Data entered by: M. Devine
Checked by: J. Hines

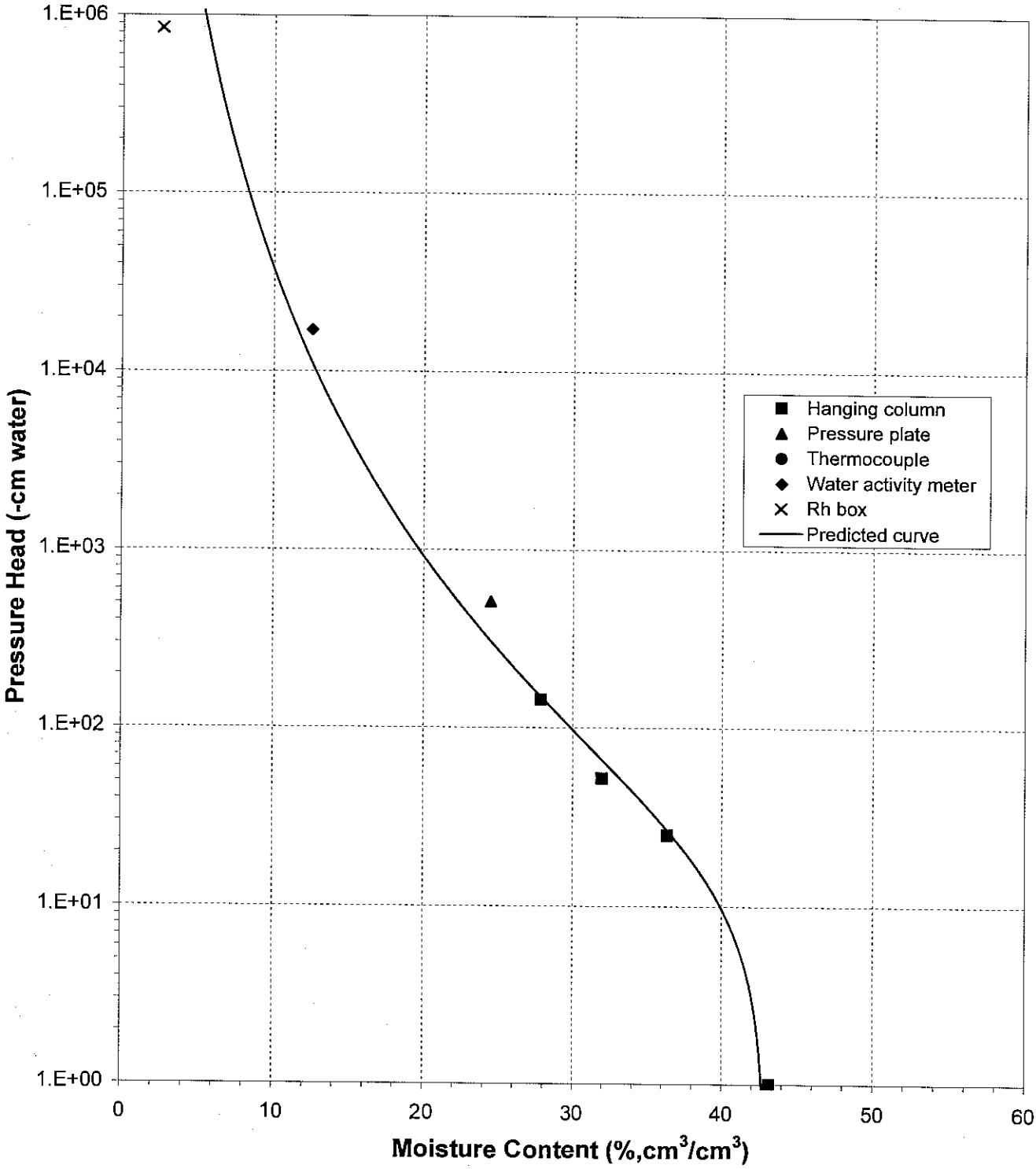
Water Retention Data Points

Sample Number: Test Plot 10A (6-7')



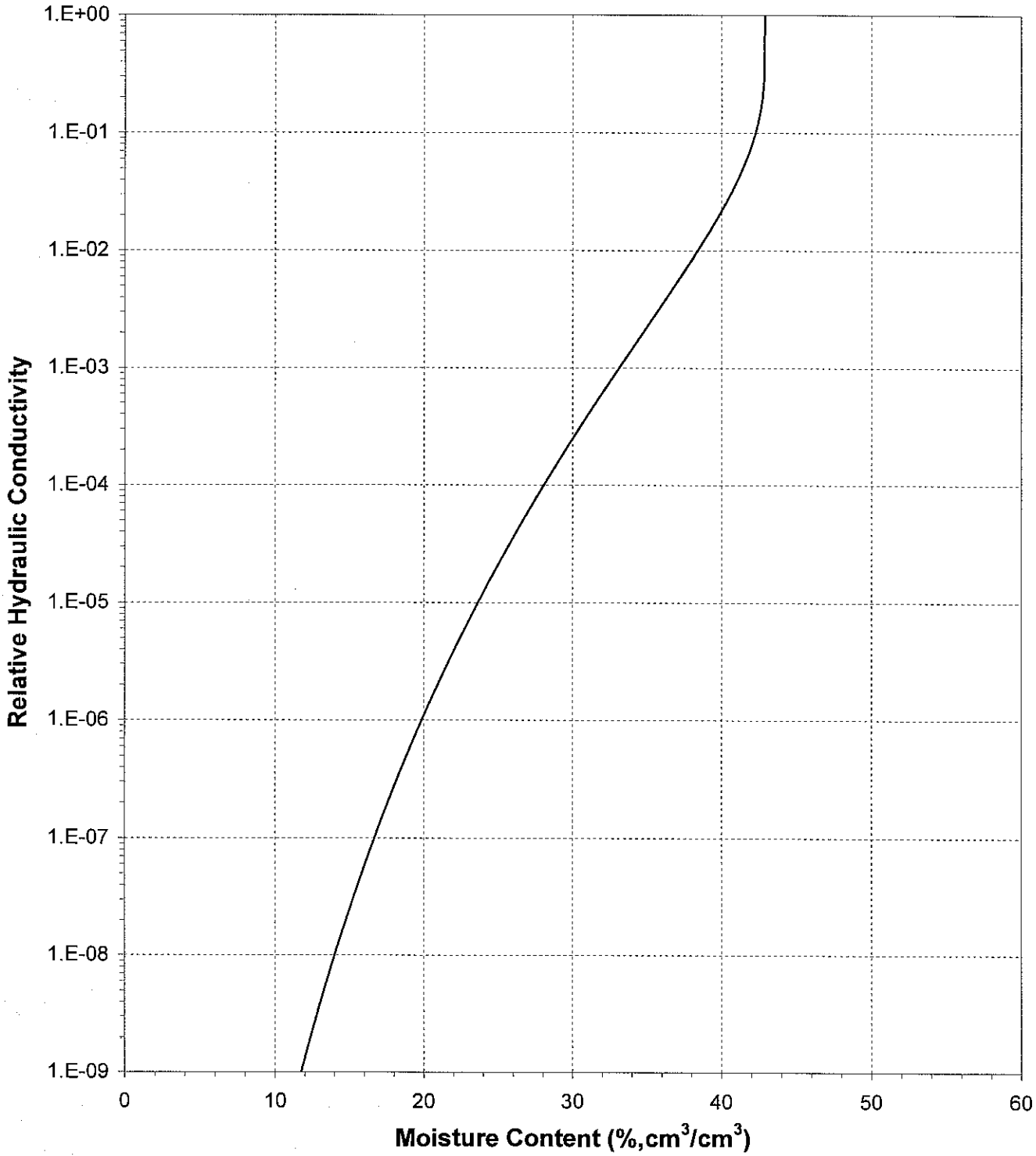
Predicted Water Retention Curve and Data Points

Sample Number: Test Plot 10A (6-7')



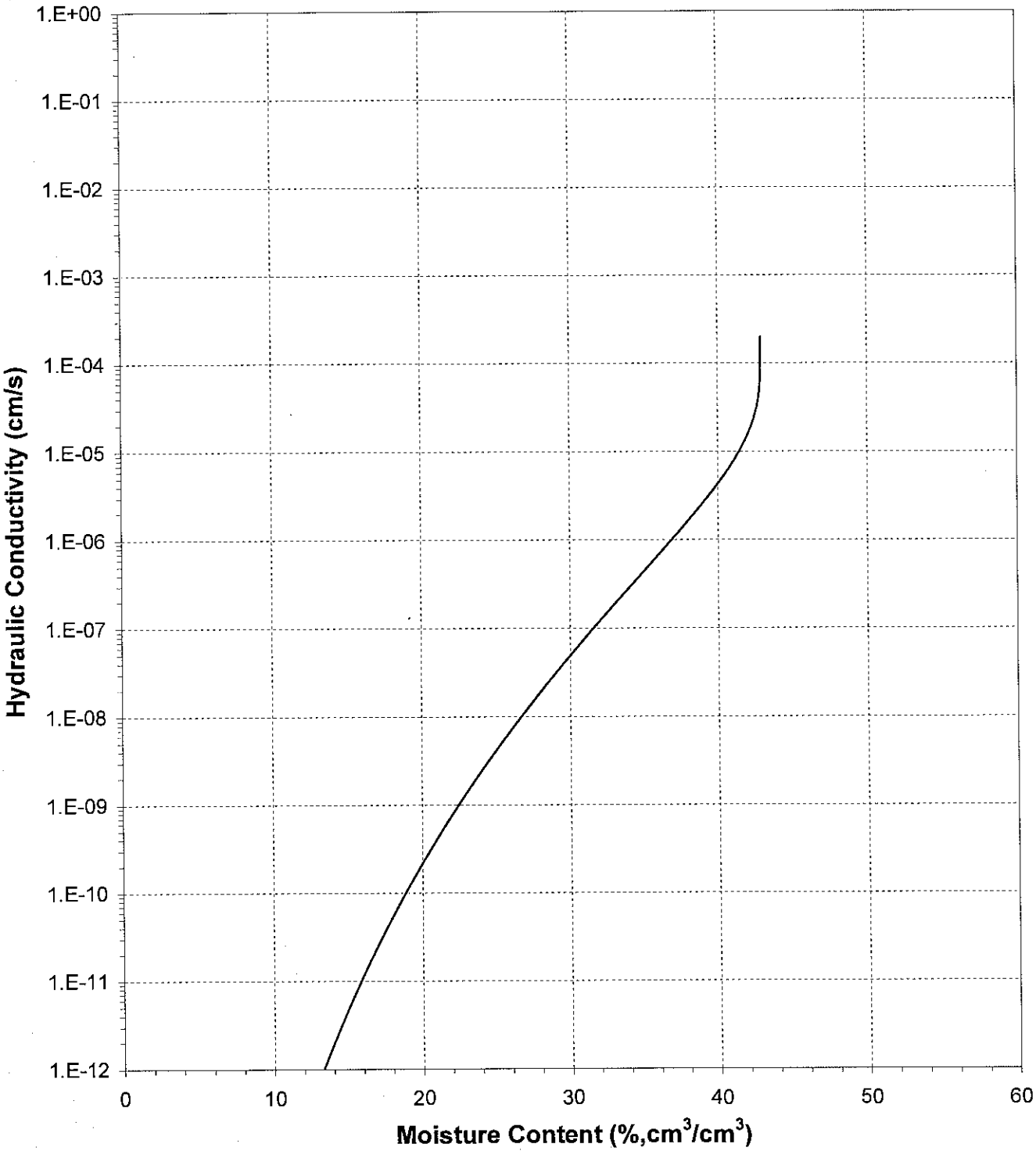
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: Test Plot 10A (6-7')



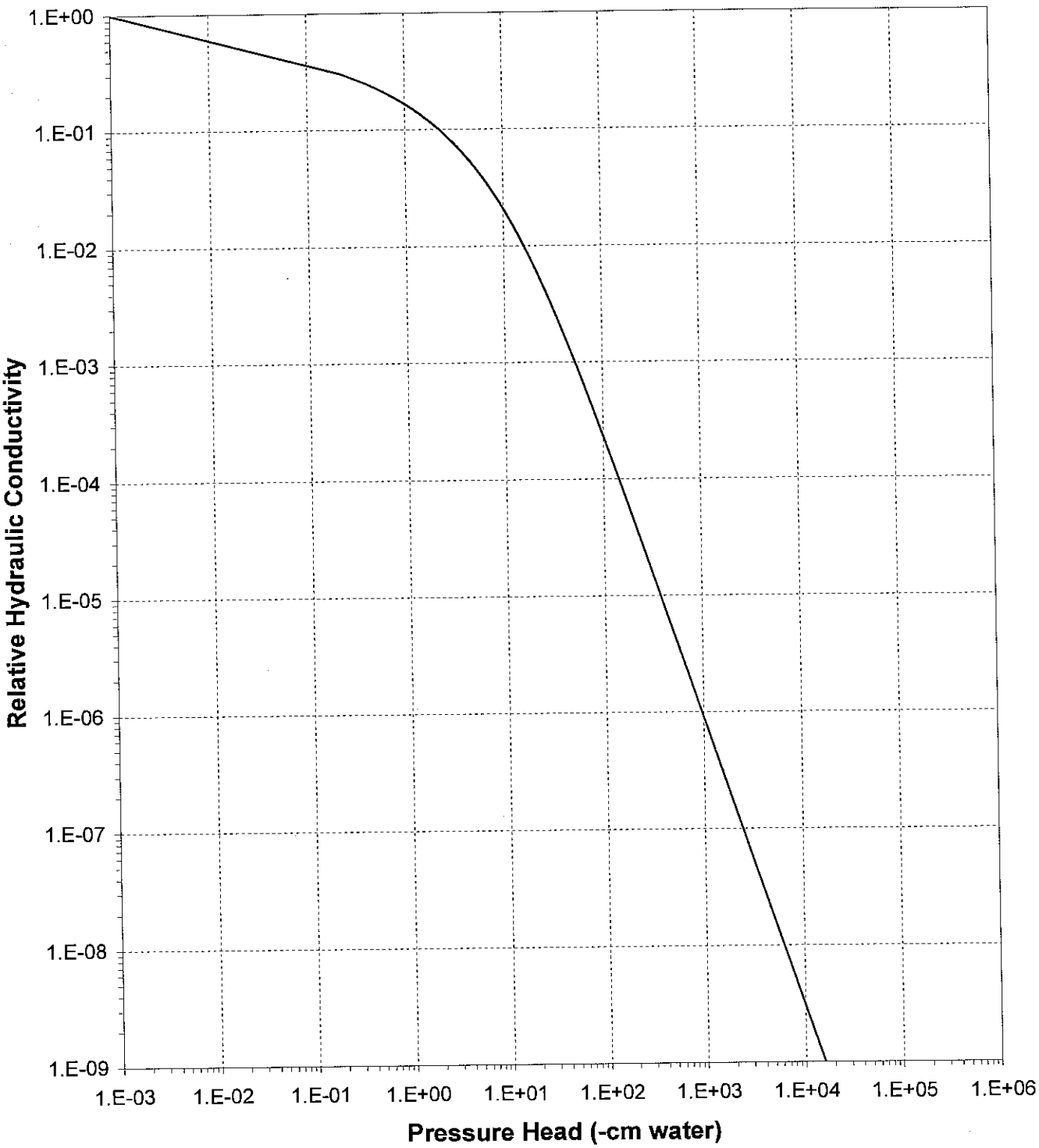
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: Test Plot 10A (6-7')



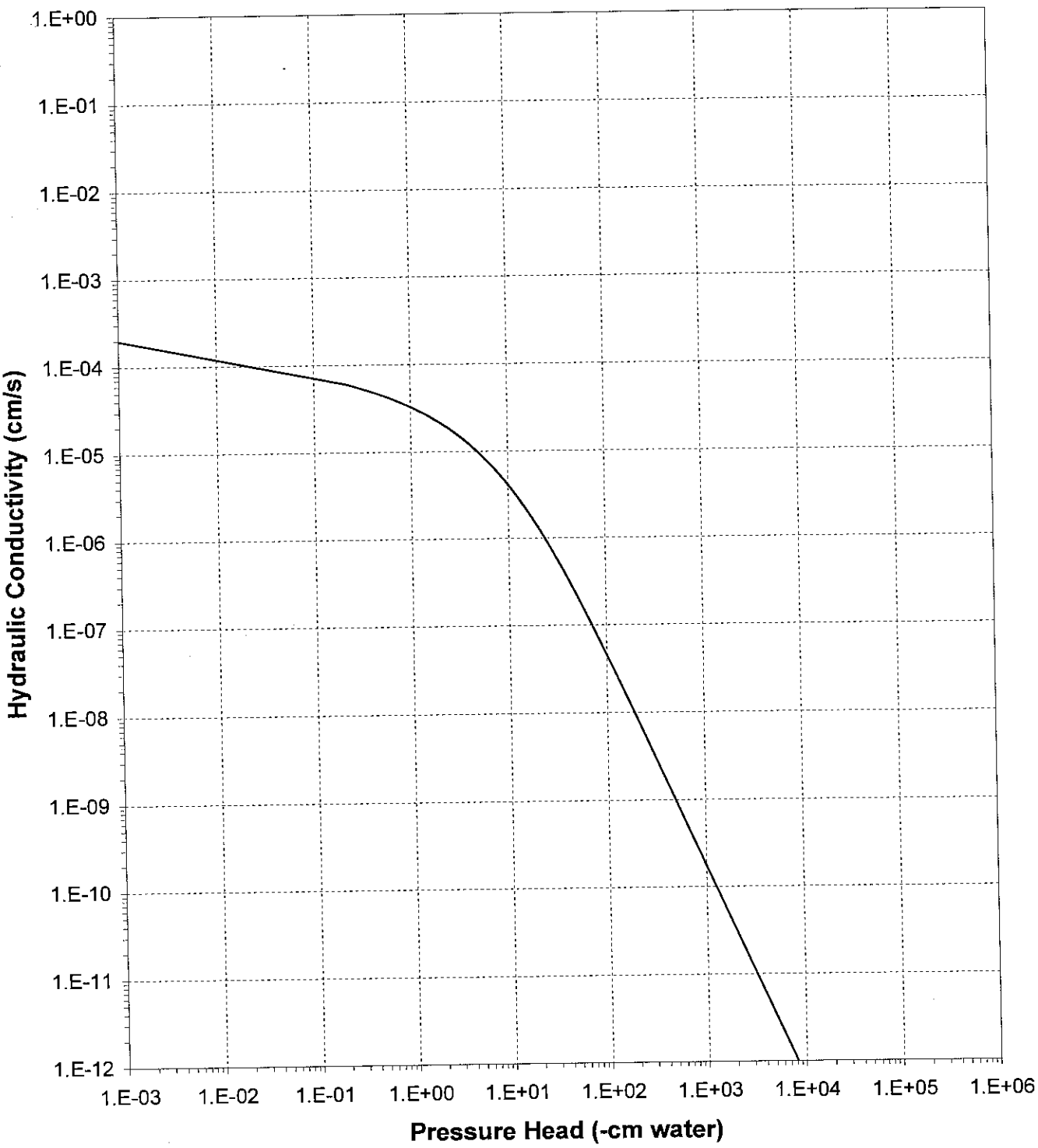
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: Test Plot 10A (6-7')



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: Test Plot 10A (6-7')



Unsaturated Hydraulic Conductivity With Gravel Corrections

Summary of Calculated Unsaturated Hydraulic Properties with Gravel Corrections

Sample Number	**Ksat**	α (cm^{-1})	**N** (dimensionless)	θ_i	θ_r	θ_s
Test Plot 1B (0-2')	7.3E-04	0.1509	1.1564	0.0780	0.0000	0.2111
Test Plot 1B (2-3')	8.5E-04	0.1731	1.1751	0.0800	0.0000	0.2296
Test Plot 1B (4-5')	5.1E-04	0.1006	1.1683	0.1186	0.0000	0.3008
Test Plot 3C (0-2')	8.4E-04	0.1266	1.1746	0.0809	0.0000	0.2587
Test Plot 3C (2-3')	1.4E-03	0.1369	1.1787	0.1017	0.0000	0.2764
Test Plot 5A (3-4')	1.6E-04	0.0605	1.1964	0.0998	0.0000	0.2702
Test Plot 7A (0-2')	7.1E-05	0.0455	1.1974	0.0629	0.0000	0.1683
Test Plot 10A (6-7')	8.5E-05	0.0628	1.1877	0.0672	0.0000	0.1811

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Gravel Correction Data Sheet

Job name: Golder
Job number: LB05.0119.00
Sample Name/Number: Test Plot 1B (0-2)
Split: #10

Uncorrected input values		Corrected Values	
Mass (coarse)(g):	6427.5		
Mass (fines)(g):	2796.8		
Dry bulk density (fines)(g/cm^3):	1.40	Density (composite)(g/cm^3):	2.09
**Density (coarse)(g/cm^3):	2.67		
Ksat value (fines)(cm/sec):	1.6E-03	Ksat composite(cm/sec):	7.3E-04
Theta initial (fines):	0.1720	Theta initial composite:	0.0780
Theta saturated (fines):	0.4655	Theta saturated composite:	0.2111
Theta residual (fines):	0.0000	Theta residual composite:	0.0000
*Theta initial (coarse):	0		
*Theta saturated (coarse):	0		
*Theta residual (coarse):	0		
*Volume (coarse voids)(cm^3):	0		

Volumetric fraction of fines in composite: 0.454
Volumetric fraction of coarse in composite: 0.546
Volumetric fraction of voids in composite: 0.000
Volume (fines)(cm^3): 1997.71
Volume (coarse)(cm^3): 2407.30
Volume (composite)(cm^3): 4405.02

*Comments: *Values will be zero if the coarse fraction is assumed to hold no water in pores. **Density based upon specific gravity tests which assumes the coarse and fine fractions are the same material.*

Date: 18-Jul-05
Data entered by: D. O'Dowd
Checked by: J. Hines

Moisture Retention Data

Hanging Column/Pressure Plate/Thermocouple

(Main Drainage Curve)

Job Name:	Golder	*Dry wt. of sample* (g):	203.83
Job Number:	LB05.0119.00	*Tare wt., screen & clamp* (g):	23.50
Sample Number:	Test Plot 1B (0-2')(Gravel Corrected)	*Tare wt., ring* (g):	88.83
Ring Number:	NA	*Tare wt., epoxy* (g):	0.00
Depth:	NA	*Sample volume* (cm^3):	145.79

Saturated weight at 0 cm tension* (g): 384.47
Volume of water[T] in saturated sample (cm^3): 68.31
Saturated moisture content (% vol): 46.85
Sample bulk density (g/cm^3): 1.40

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content[T] (% vol)
Hanging column:	13-Jun-05 / 09:45	384.47	0.00	46.85
	20-Jun-05 / 11:30	370.51	17.20	37.28
	27-Jun-05 / 13:25	363.76	51.50	32.65
	03-Jul-05 / 10:35	361.69	88.00	31.23
Pressure plate:	09-Jul-05 / 11:45	353.72	509.90	25.76

Comments:

* Weight including tares
[T] Assumed density of water is 1.0 g/cm^3

Laboratory analysis by: M. Carrillo
Data entered by: D. O'Dowd
Checked by: J. Hines

Moisture Retention Data

Water Activity Meter/Relative Humidity Box

(Main Drainage Curve)

Job Name: Golder
Job Number: LB05.0119.00
Sample Number: Test Plot 1B (0-2')(Gravel Corrected)
Ring Number: NA
Depth: NA

Dry weight of water activity meter sample* (g): 137.20
Tare weight, jar (g): 113.51
Sample bulk density (g/cm^3): 1.40

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content^T (% vol)
Water Activity Meter:	20-Jun-05 / 10:30	139.89	17540.6	15.88

Dry weight of relative humidity box sample* (g): 62.96
Tare weight (g): 37.12
Sample bulk density (g/cm^3): 1.40

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content^T (% vol)
Relative humidity box:	20-Jun-05 / 14:20	63.49	851293	2.85

Comments:

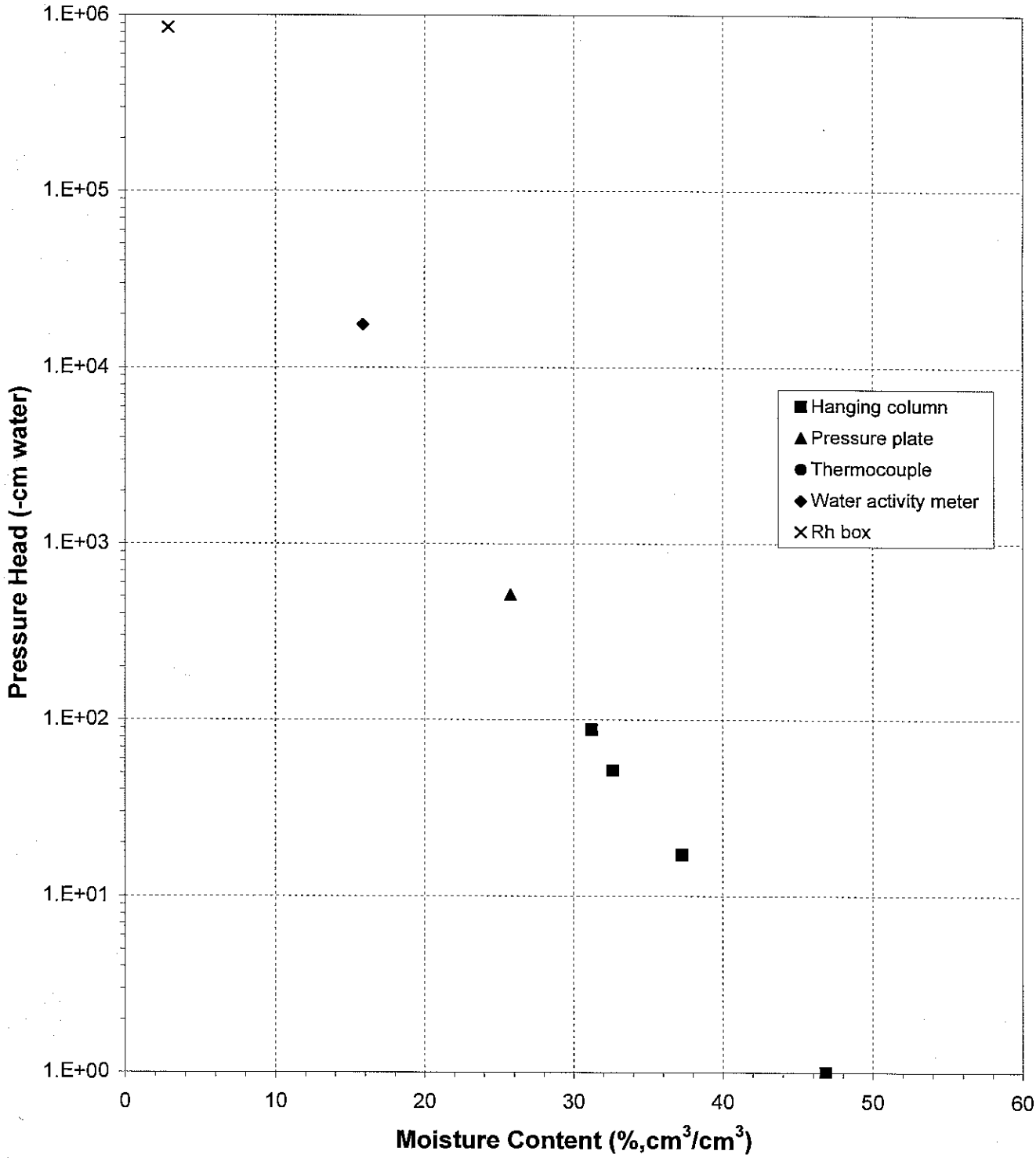
* Weight including tares

† Assumed density of water is 1.0 g/cm^3

Laboratory analysis by: M. Carrillo/S. Shannon
Data entered by: D. O'Dowd
Checked by: J. Hines

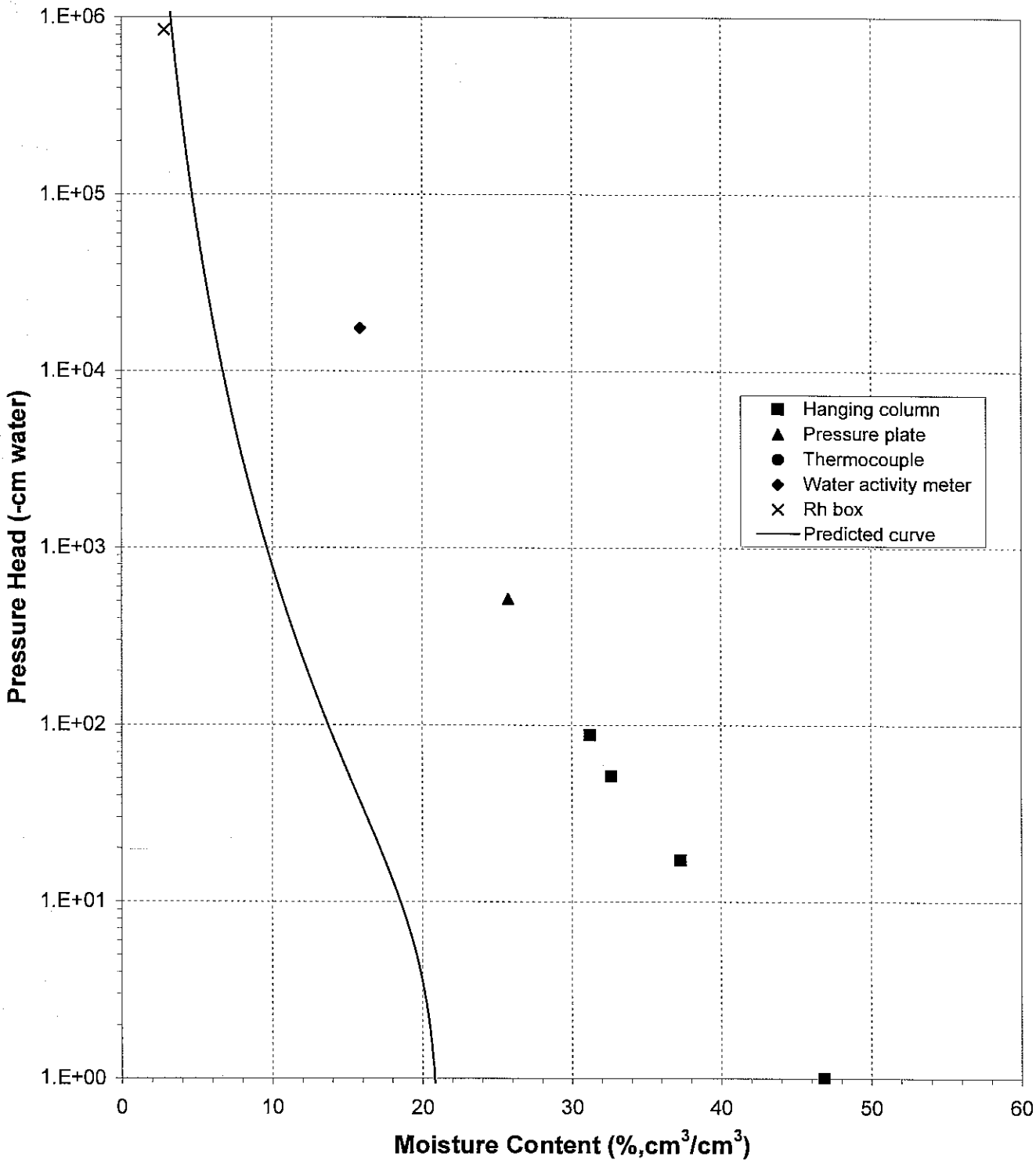
Water Retention Data Points

Sample Number: Test Plot 1B (0-2')(Gravel Corrected)



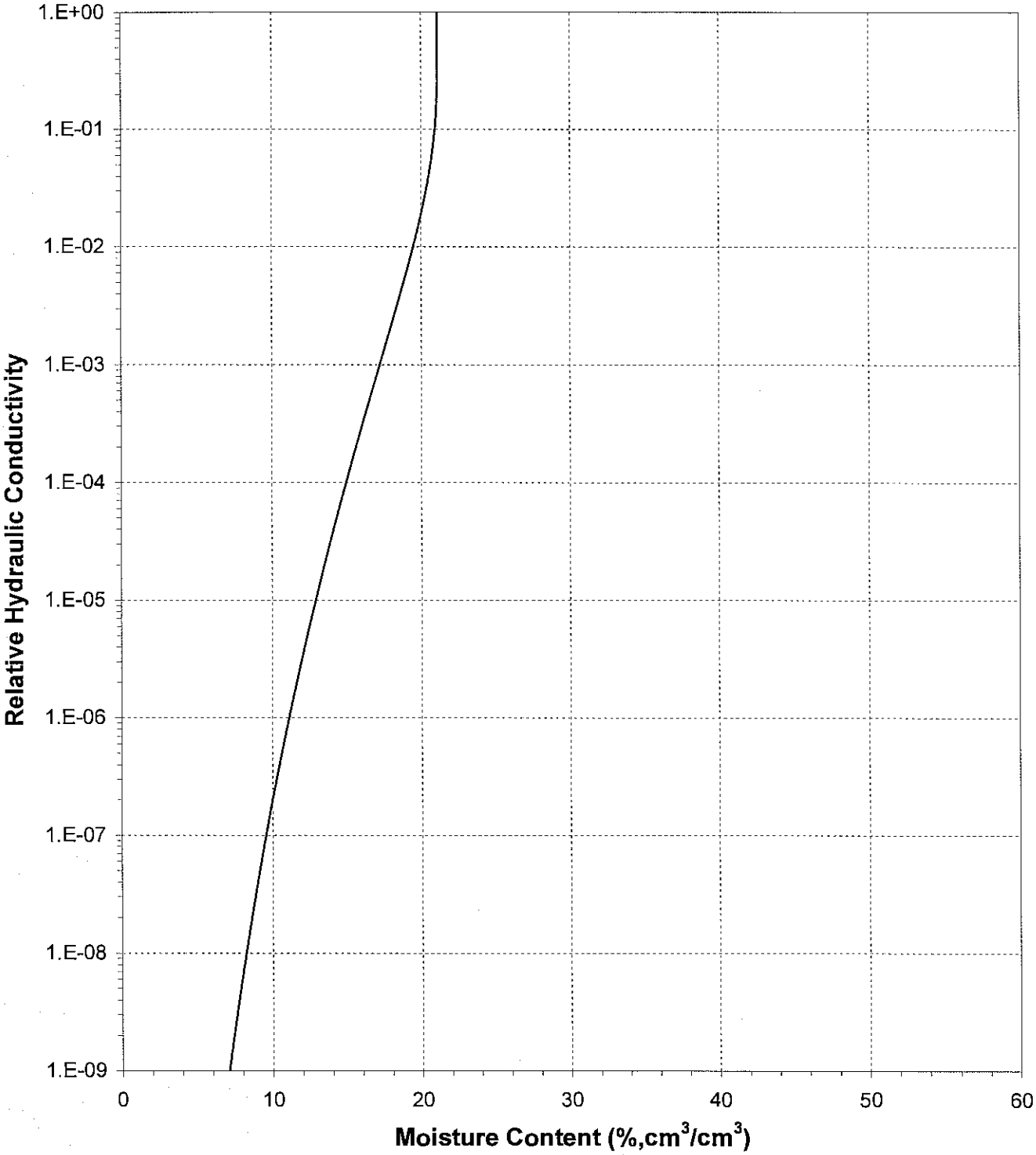
Predicted Water Retention Curve and Data Points

Sample Number: Test Plot 1B (0-2')(Gravel Corrected)



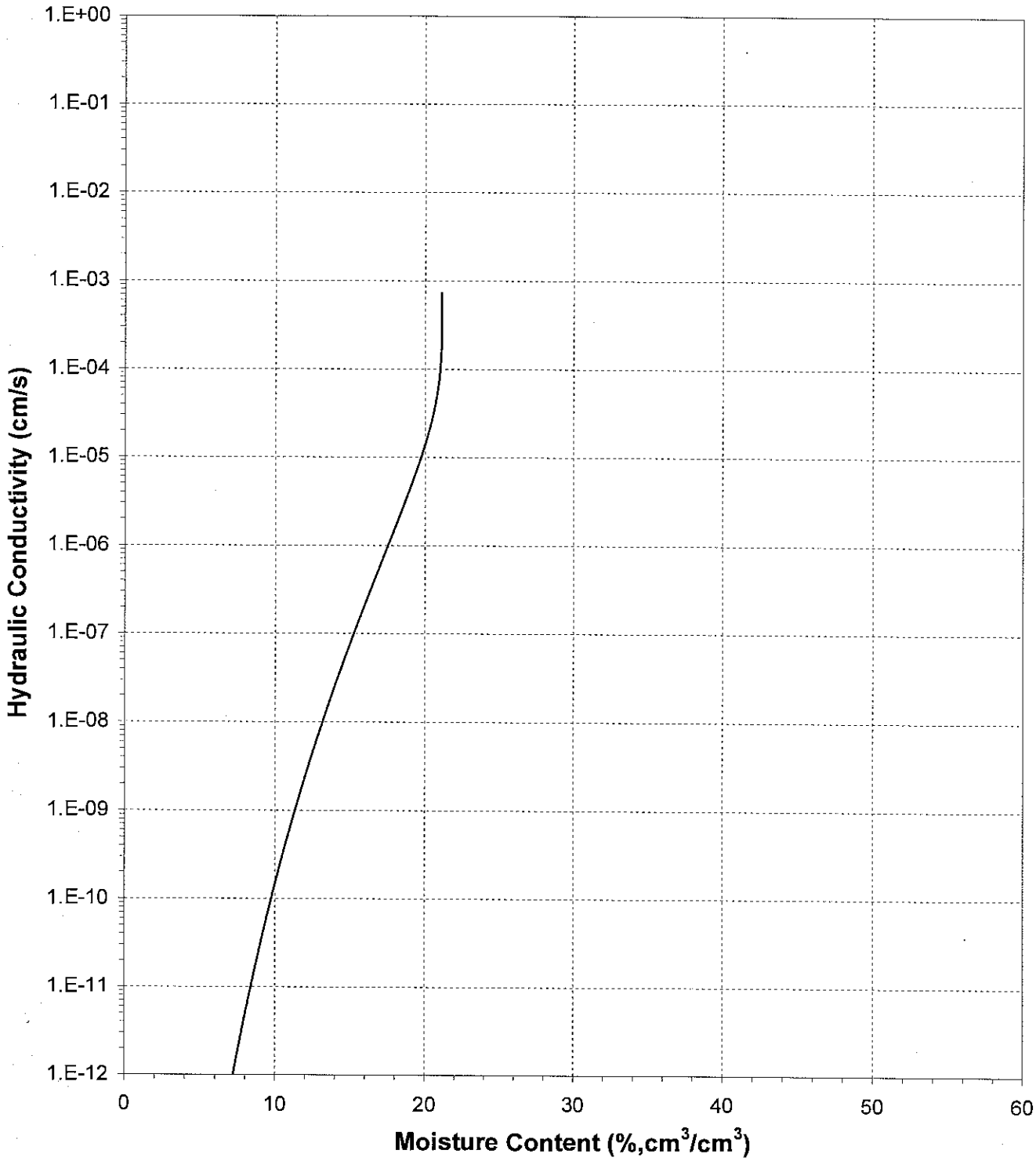
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: Test Plot 1B (0-2')(Gravel Corrected)



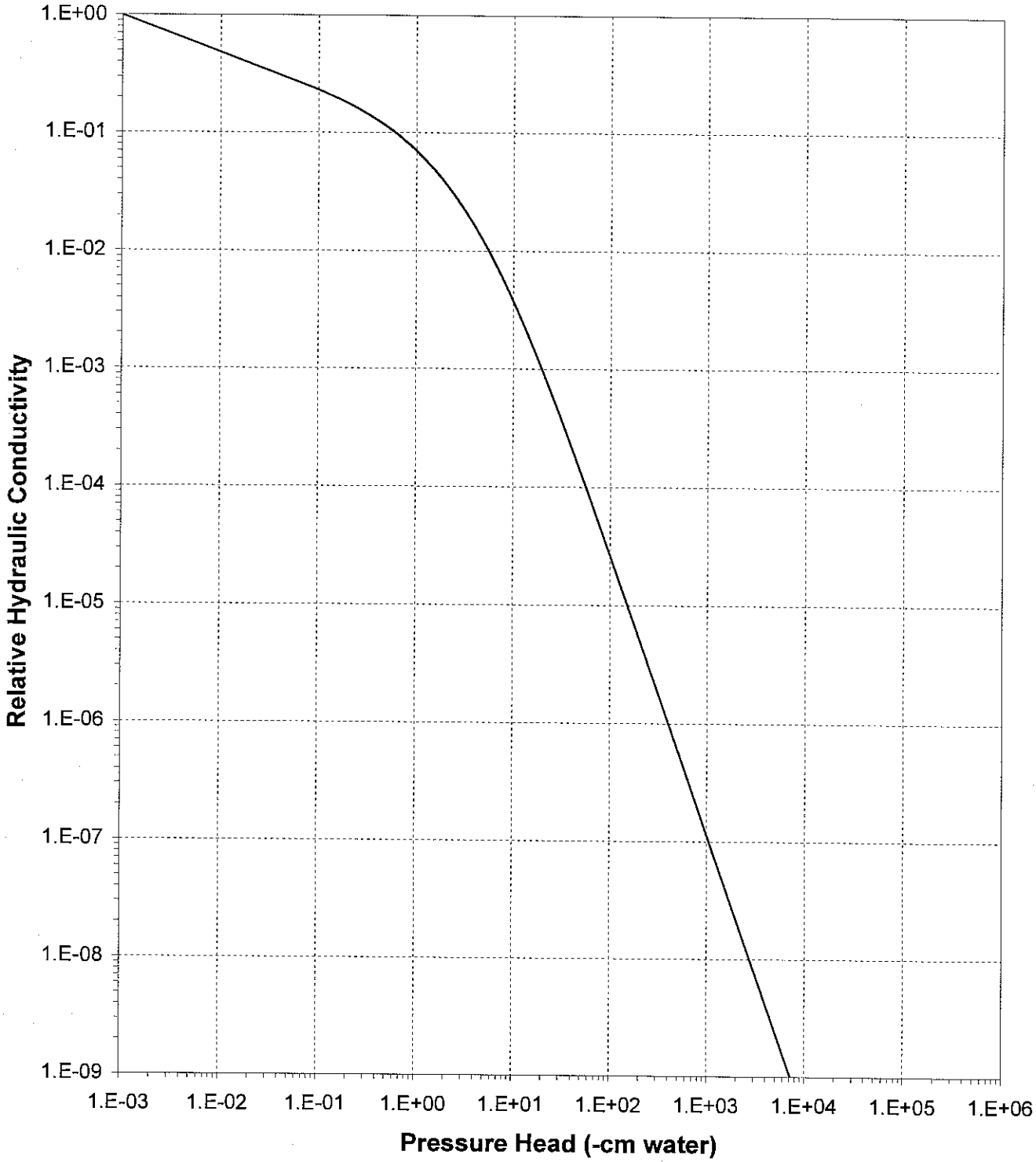
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: Test Plot 1B (0-2')(Gravel Corrected)



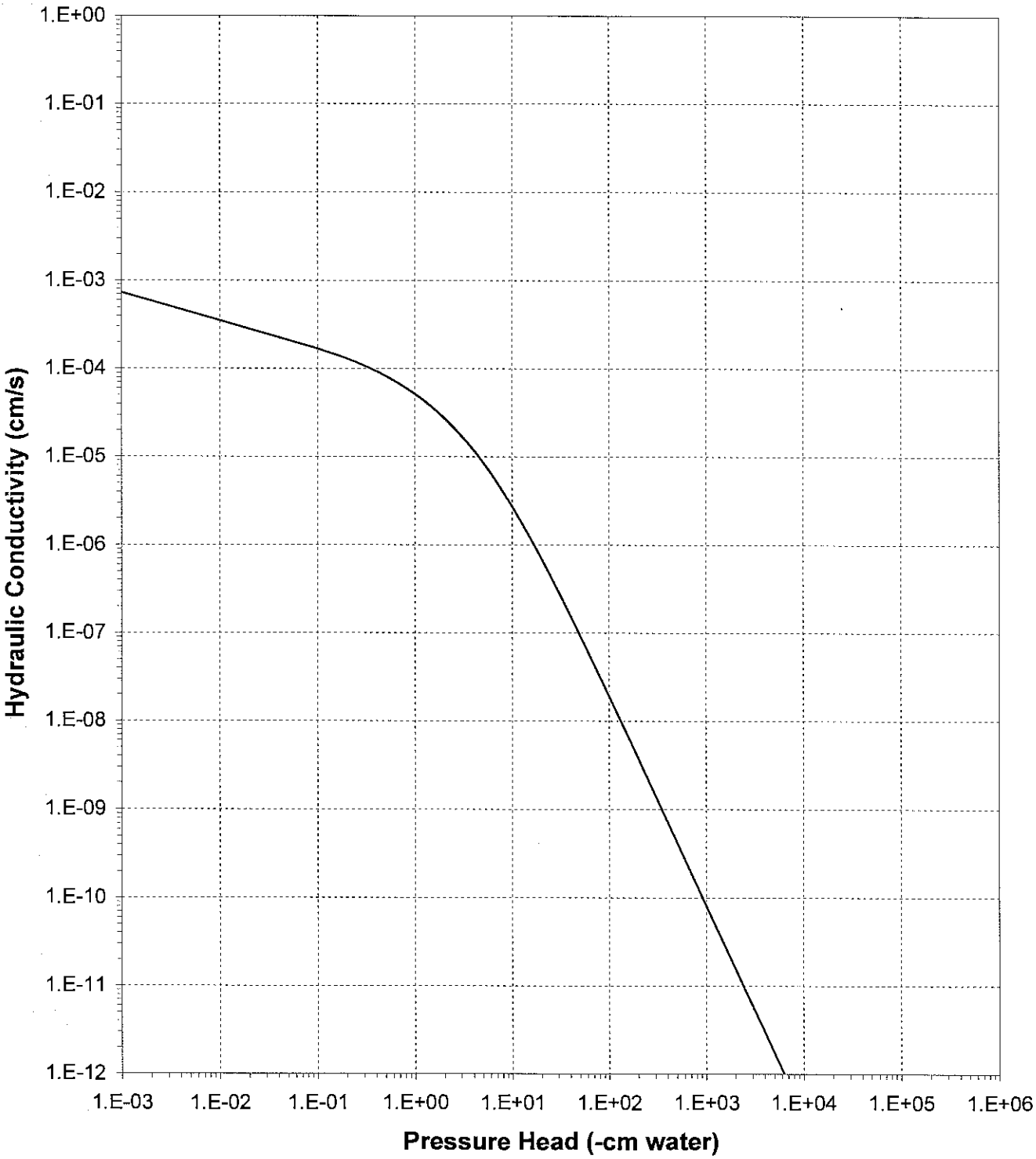
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: Test Plot 1B (0-2')(Gravel Corrected)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: Test Plot 1B (0-2')(Gravel Corrected)



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Gravel Correction Data Sheet

Job name: Golder
Job number: LB05.0119.00
Sample Name/Number: Test Plot 1B (2-3)
Split: #10

Uncorrected input values		Corrected Values	
Mass (coarse)(g):	6600		
Mass (fines)(g):	2906		
Dry bulk density (fines)(g/cm^3):	1.39	Density (composite)(g/cm^3):	2.04
**Density (coarse)(g/cm^3):	2.58		
Ksat value (fines)(cm/sec):	1.9E-03	Ksat composite(cm/sec):	8.5E-04
Theta initial (fines):	0.1780	Theta initial composite:	0.0800
Theta saturated (fines):	0.5106	Theta saturated composite:	0.2296
Theta residual (fines):	0.0000	Theta residual composite:	0.0000
*Theta initial (coarse):	0		
*Theta saturated (coarse):	0		
*Theta residual (coarse):	0		
*Volume (coarse voids)(cm^3):	0		

Volumetric fraction of fines in composite: 0.450
Volumetric fraction of coarse in composite: 0.550
Volumetric fraction of voids in composite: 0.000
Volume (fines)(cm^3): 2090.65
Volume (coarse)(cm^3): 2558.14
Volume (composite)(cm^3): 4648.79

*Comments: *Values will be zero if the coarse fraction is assumed to hold no water in pores. **Density based upon specific gravity tests which assumes the coarse and fine fractions are the same material.*

Date: 18-Jul-05
Data entered by: D. O'Dowd
Checked by: J. Hines

Moisture Retention Data

Hanging Column/Pressure Plate/Thermocouple

(Main Drainage Curve)

Job Name:	Golder	*Dry wt. of sample* (g):	196.26
Job Number:	LB05.0119.00	*Tare wt., screen & clamp* (g):	23.47
Sample Number:	Test Plot 1B (2-3')(Gravel Corrected)	*Tare wt., ring* (g):	86.74
Ring Number:	NA	*Tare wt., epoxy* (g):	0.00
Depth:	NA	*Sample volume* (cm^3):	140.73

Saturated weight at 0 cm tension* (g): 378.71
Volume of water[T] in saturated sample (cm^3): 72.24
Saturated moisture content (% vol): 51.33
Sample bulk density (g/cm^3): 1.39

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content[T] (% vol)
Hanging column:	13-Jun-05 / 11:55	378.71	0.00	51.33
	20-Jun-05 / 11:30	361.65	17.20	39.21
	27-Jun-05 / 12:25	354.00	51.50	33.77
	03-Jul-05 / 10:35	351.80	88.00	32.21
Pressure plate:	09-Jul-05 / 11:45	343.29	509.90	26.16

Comments:

* Weight including tares
[I] Assumed density of water is 1.0 g/cm^3

Laboratory analysis by: M. Carrillo
Data entered by: D. O'Dowd
Checked by: J. Hines

Moisture Retention Data

Water Activity Meter/Relative Humidity Box

(Main Drainage Curve)

Job Name: Golder
Job Number: LB05.0119.00
Sample Number: Test Plot 1B (2-3')(Gravel Corrected)
Ring Number: NA
Depth: NA

Dry weight of water activity meter sample* (g): 134.66
Tare weight, jar (g): 112.64
Sample bulk density (g/cm^3): 1.39

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content^T (% vol)
Water Activity Meter:	20-Jun-05 / 13:05	136.71	14277.2	12.98

Dry weight of relative humidity box sample* (g): 69.58
Tare weight (g): 39.03
Sample bulk density (g/cm^3): 1.39

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content^T (% vol)
Relative humidity box:	20-Jun-05 / 14:20	70.28	851293	3.19

Comments:

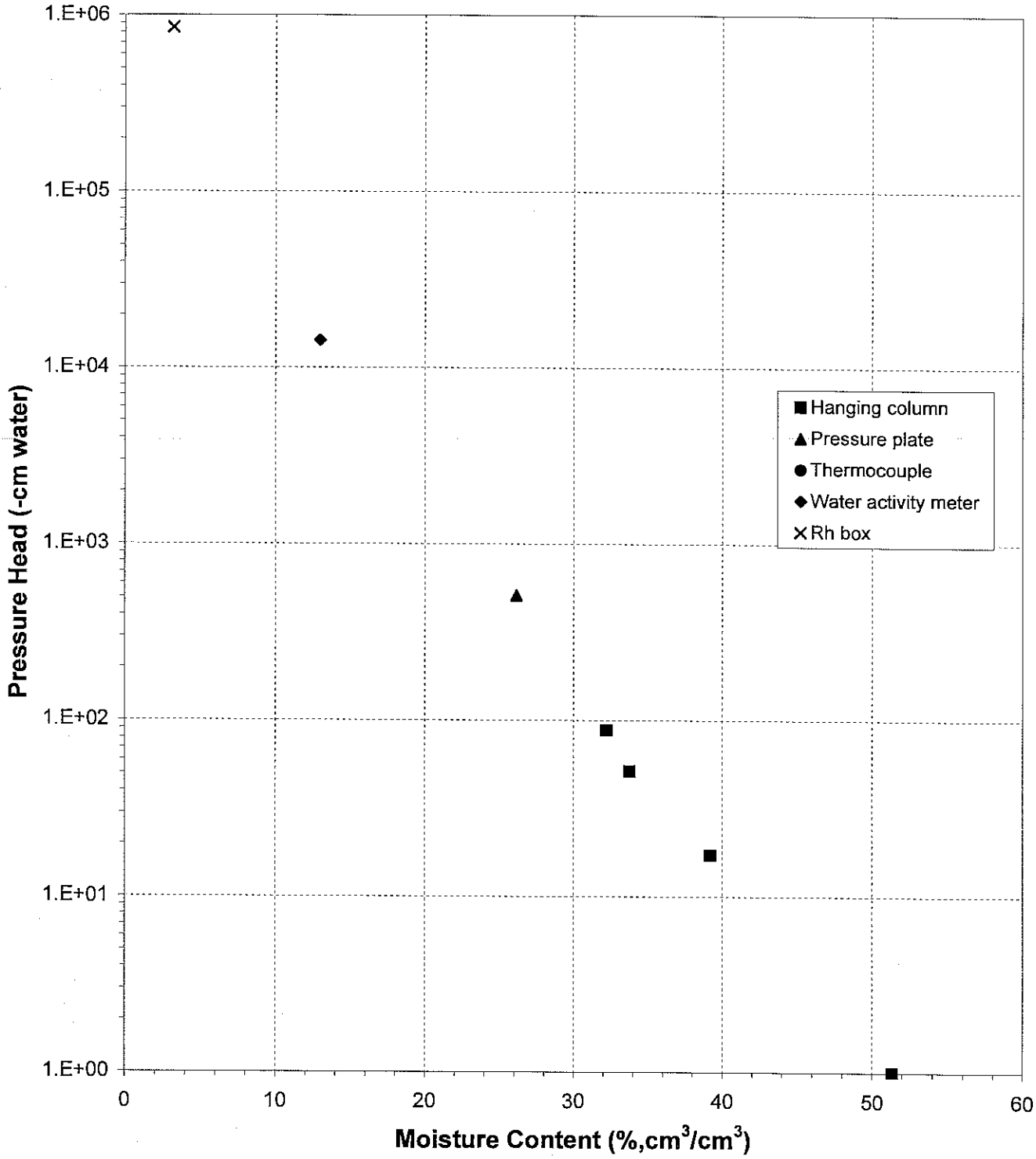
* Weight including tares

† Assumed density of water is 1.0 g/cm^3

Laboratory analysis by: D. O'Dowd/S. Shannon
Data entered by: D. O'Dowd
Checked by: J. Hines

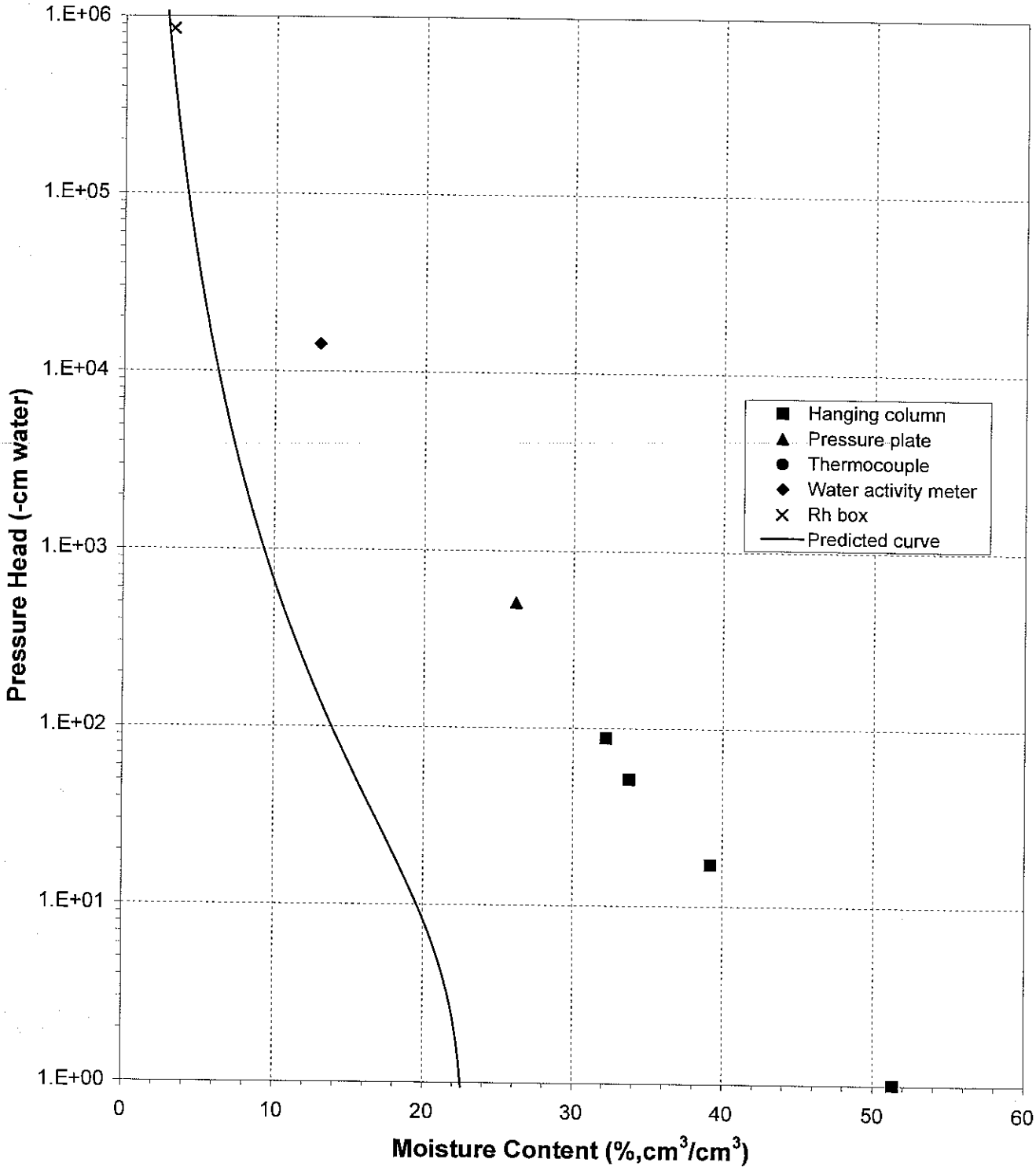
Water Retention Data Points

Sample Number: Test Plot 1B (2-3')(Gravel Corrected)



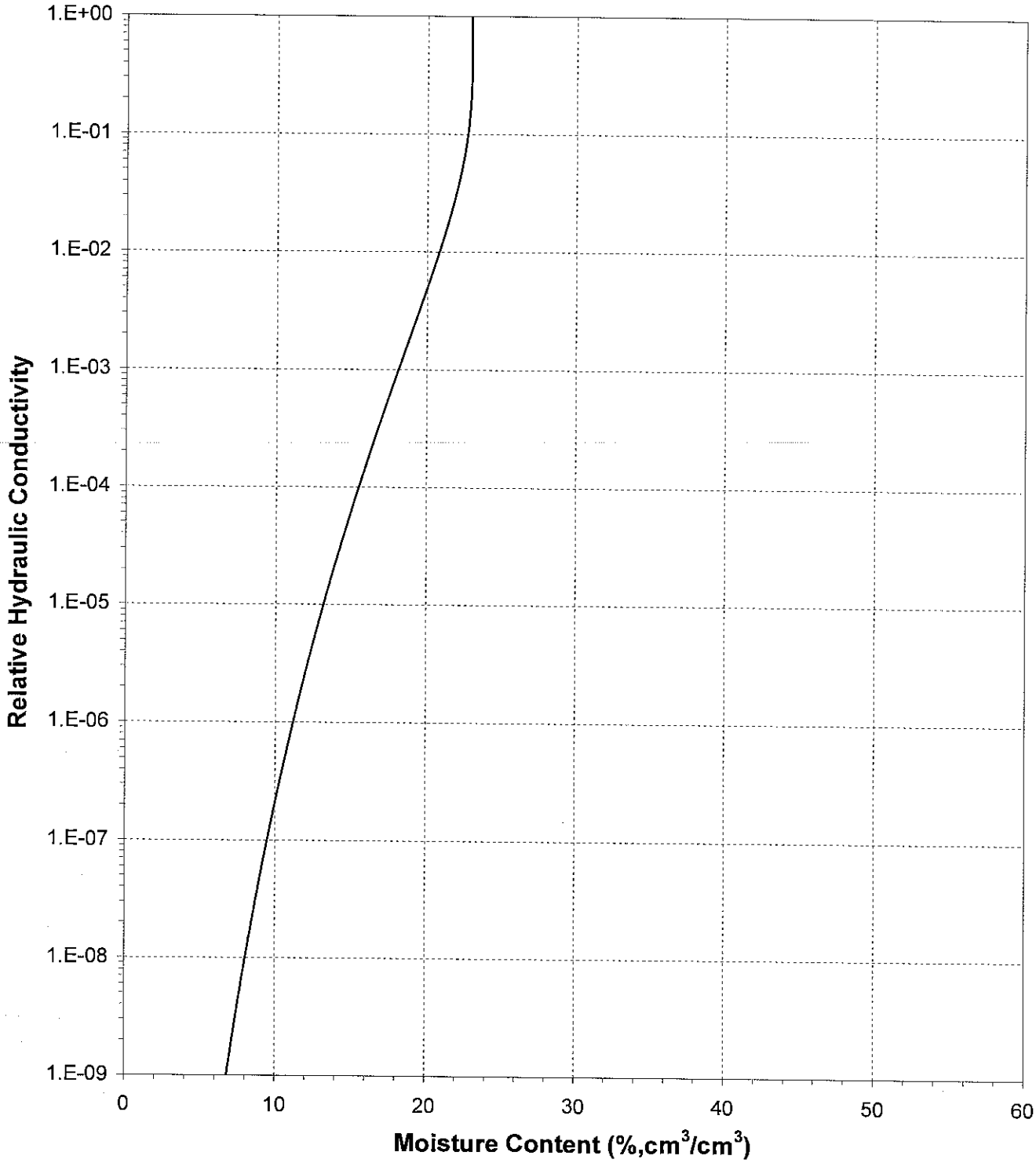
Predicted Water Retention Curve and Data Points

Sample Number: Test Plot 1B (2-3')(Gravel Corrected)



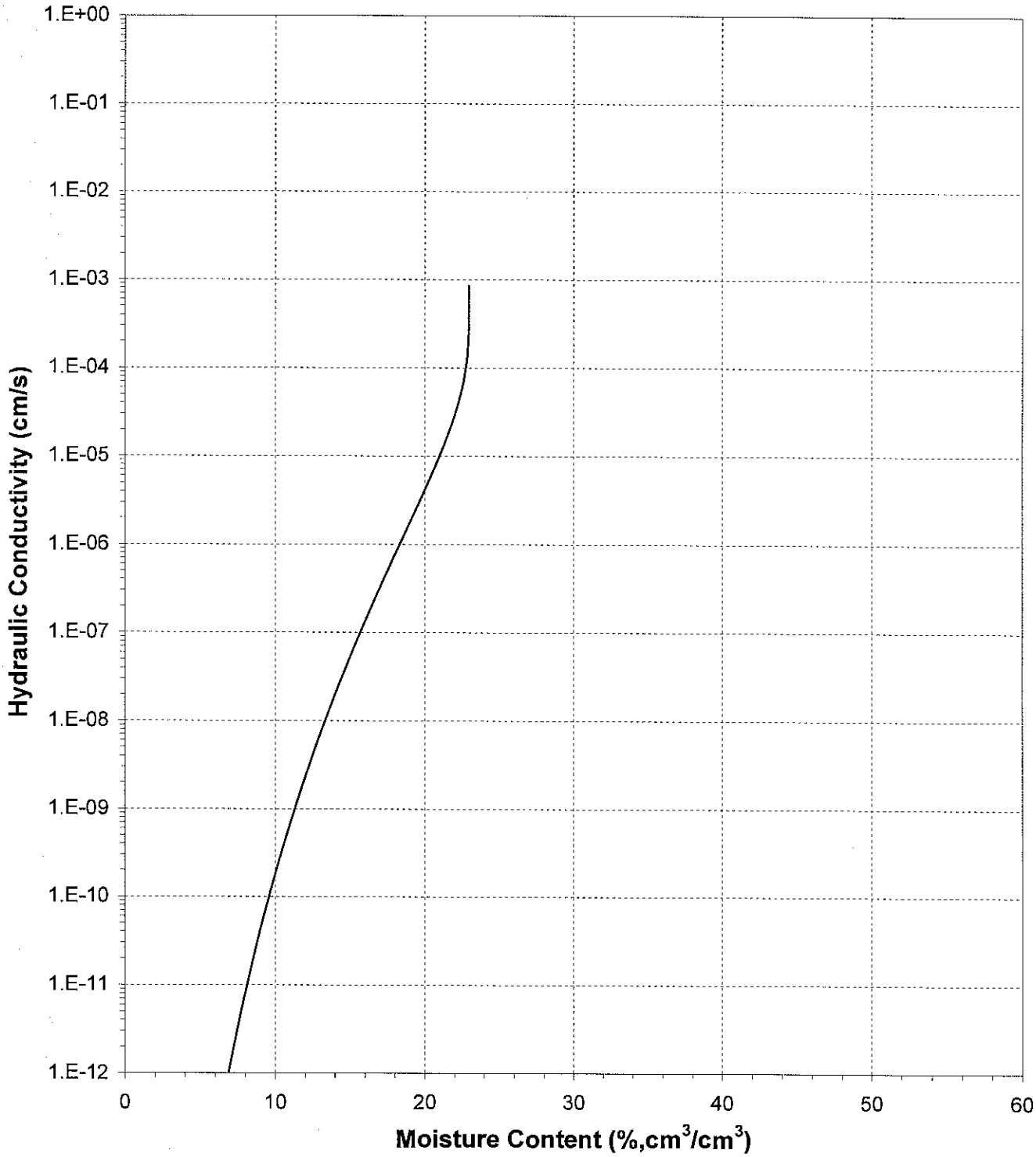
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: Test Plot 1B (2-3')(Gravel Corrected)



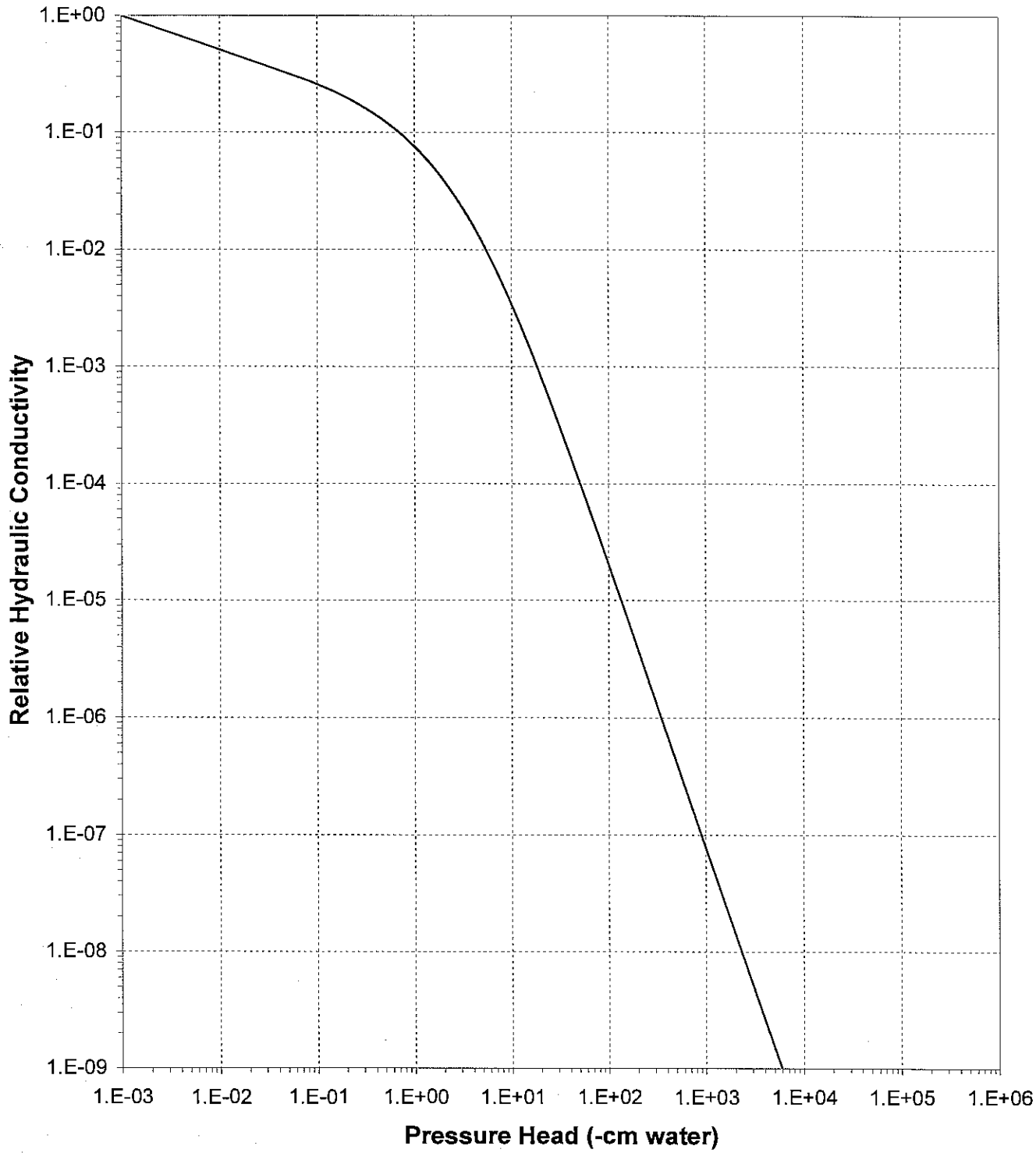
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: Test Plot 1B (2-3')(Gravel Corrected)



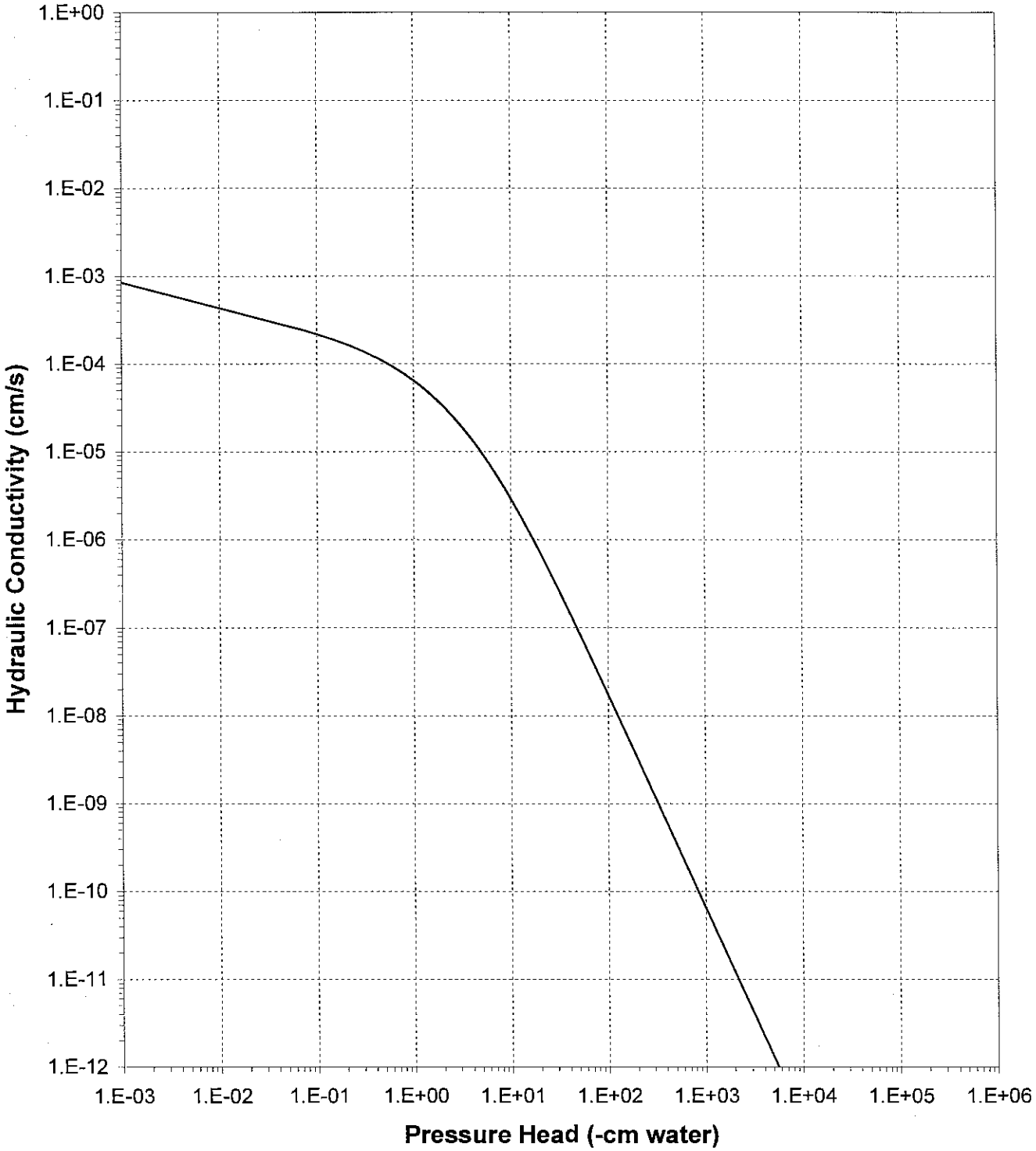
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: Test Plot 1B (2-3')(Gravel Corrected)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: Test Plot 1B (2-3')(Gravel Corrected)



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Gravel Correction Data Sheet

Job name: Golder
Job number: LB05.0119.00
Sample Name/Number: Test Plot 1B (4-5)
Split: #10

Uncorrected input values		Corrected Values	
Mass (coarse)(g):	2093		
Mass (fines)(g):	2075		
Dry bulk density (fines)(g/cm^3):	1.39	Density (composite)(g/cm^3):	1.81
**Density (coarse)(g/cm^3):	2.58		
Ksat value (fines)(cm/sec):	7.9E-04	Ksat composite(cm/sec):	5.1E-04
Theta initial (fines):	0.1830	Theta initial composite:	0.1186
Theta saturated (fines):	0.4642	Theta saturated composite:	0.3008
Theta residual (fines):	0.0000	Theta residual composite:	0.0000
*Theta initial (coarse):	0		
*Theta saturated (coarse):	0		
*Theta residual (coarse):	0		
*Volume (coarse voids)(cm^3):	0		

Volumetric fraction of fines in composite: 0.648
Volumetric fraction of coarse in composite: 0.352
Volumetric fraction of voids in composite: 0.000
Volume (fines)(cm^3): 1492.81
Volume (coarse)(cm^3): 811.24
Volume (composite)(cm^3): 2304.05

*Comments: *Values will be zero if the coarse fraction is assumed to hold no water in pores. **Density based upon specific gravity tests which assumes the coarse and fine fractions are the same material.*

Date: 18-Jul-05
Data entered by: D. O'Dowd
Checked by: J. Hines

Moisture Retention Data

Hanging Column/Pressure Plate/Thermocouple

(Main Drainage Curve)

Job Name:	Golder	*Dry wt. of sample* (g):	194.35
Job Number:	LB05.0119.00	*Tare wt., screen & clamp* (g):	23.21
Sample Number:	Test Plot 1B (4-5')(Gravel Corrected)	*Tare wt., ring* (g):	116.59
Ring Number:	NA	*Tare wt., epoxy* (g):	0.00
Depth:	NA	*Sample volume* (cm^3):	140.32

Saturated weight at 0 cm tension* (g):	399.99
Volume of water[1] in saturated sample (cm^3):	65.84
Saturated moisture content (% vol):	46.92
Sample bulk density (g/cm^3):	1.39

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content[1] (% vol)
Hanging column:	13-Jun-05 / 09:50	399.99	0.00	46.92
	20-Jun-05 / 13:15	385.51	22.20	36.60
	27-Jun-05 / 13:45	381.92	51.00	34.04
	03-Jul-05 / 10:50	378.01	124.00	31.26
Pressure plate:	09-Jul-05 / 11:40	371.06	509.90	26.30

Comments:

* Weight including tares

[1] Assumed density of water is 1.0 g/cm^3

Laboratory analysis by: M. Carrillo
Data entered by: D. O'Dowd
Checked by: J. Hines

Moisture Retention Data

Water Activity Meter/Relative Humidity Box

(Main Drainage Curve)

Job Name: Golder
Job Number: LB05.0119.00
Sample Number: Test Plot 1B (4-5')(Gravel Corrected)
Ring Number: NA
Depth: NA

Dry weight of water activity meter sample* (g): 137.24
Tare weight, jar (g): 113.41
Sample bulk density (g/cm^3): 1.39

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content^T (% vol)
Water Activity Meter:	22-Jun-05 / 13:10	139.63	17438.6	13.89

Dry weight of relative humidity box sample* (g): 88.54
Tare weight (g): 41.87
Sample bulk density (g/cm^3): 1.39

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content^T (% vol)
Relative humidity box:	20-Jun-05 / 14:20	89.69	851293	3.43

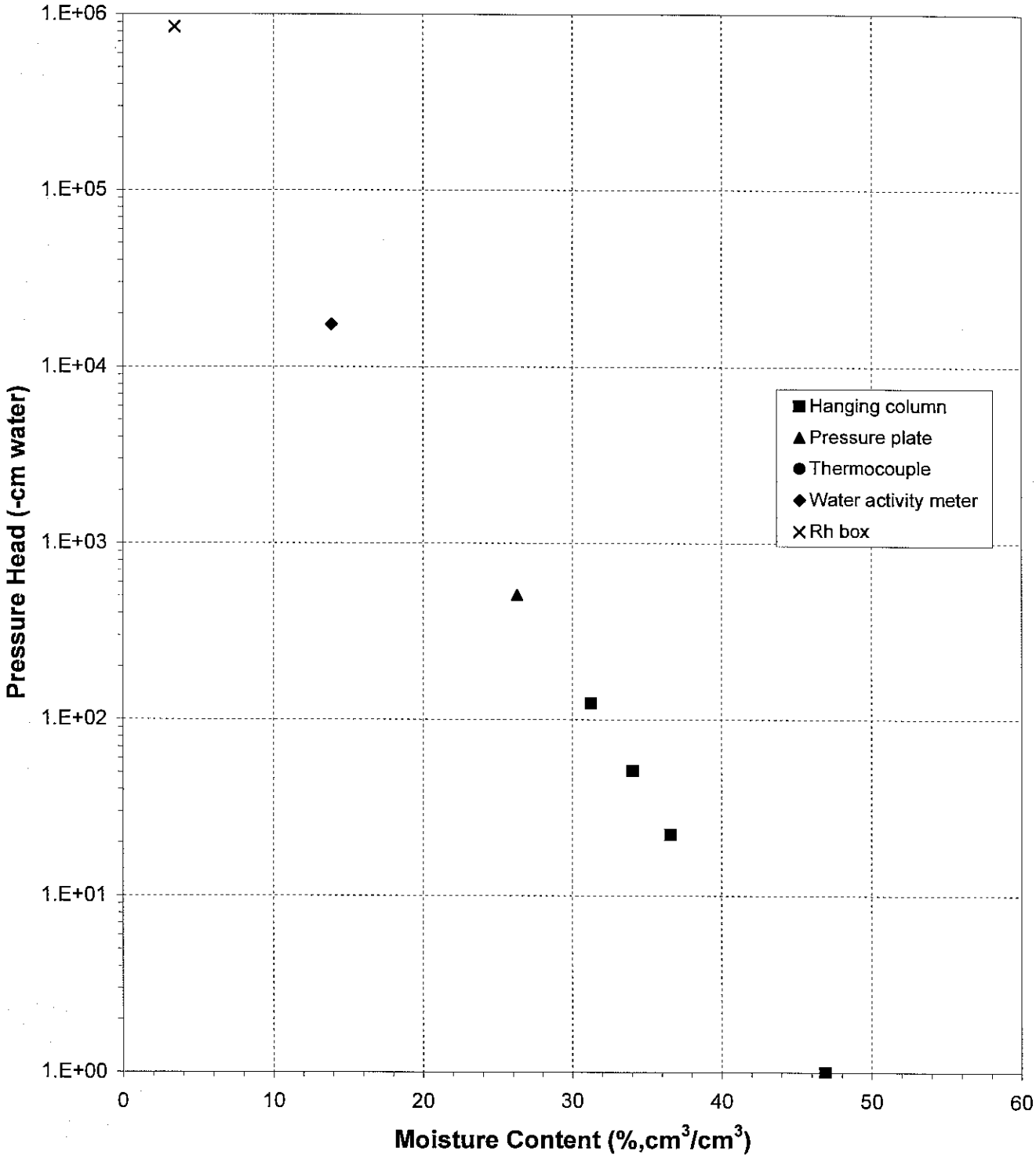
Comments:

* Weight including tares
† Assumed density of water is 1.0 g/cm^3

Laboratory analysis by: D. O'Dowd/S. Shannon
Data entered by: D. O'Dowd
Checked by: J. Hines

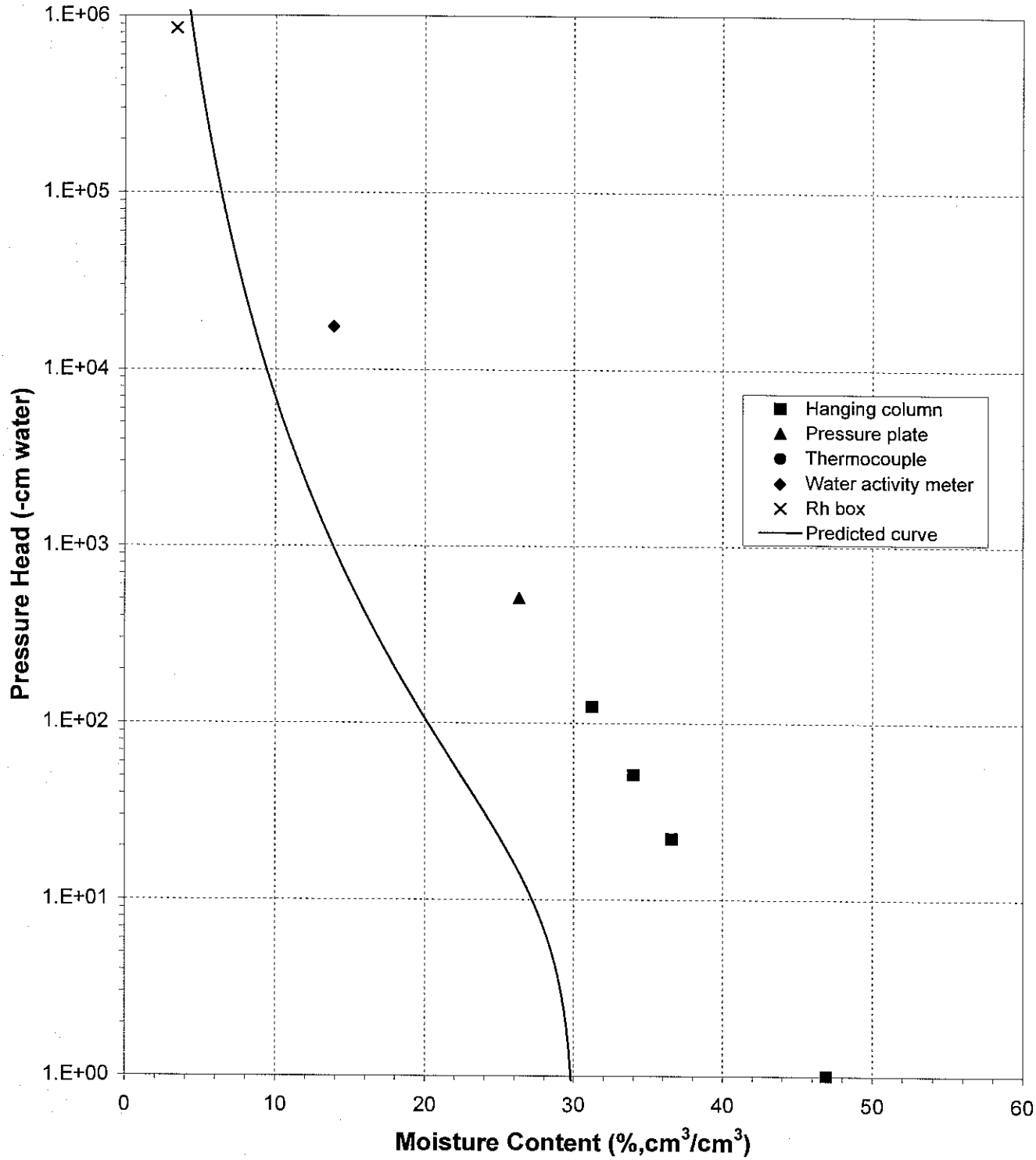
Water Retention Data Points

Sample Number: Test Plot 1B (4-5')(Gravel Corrected)



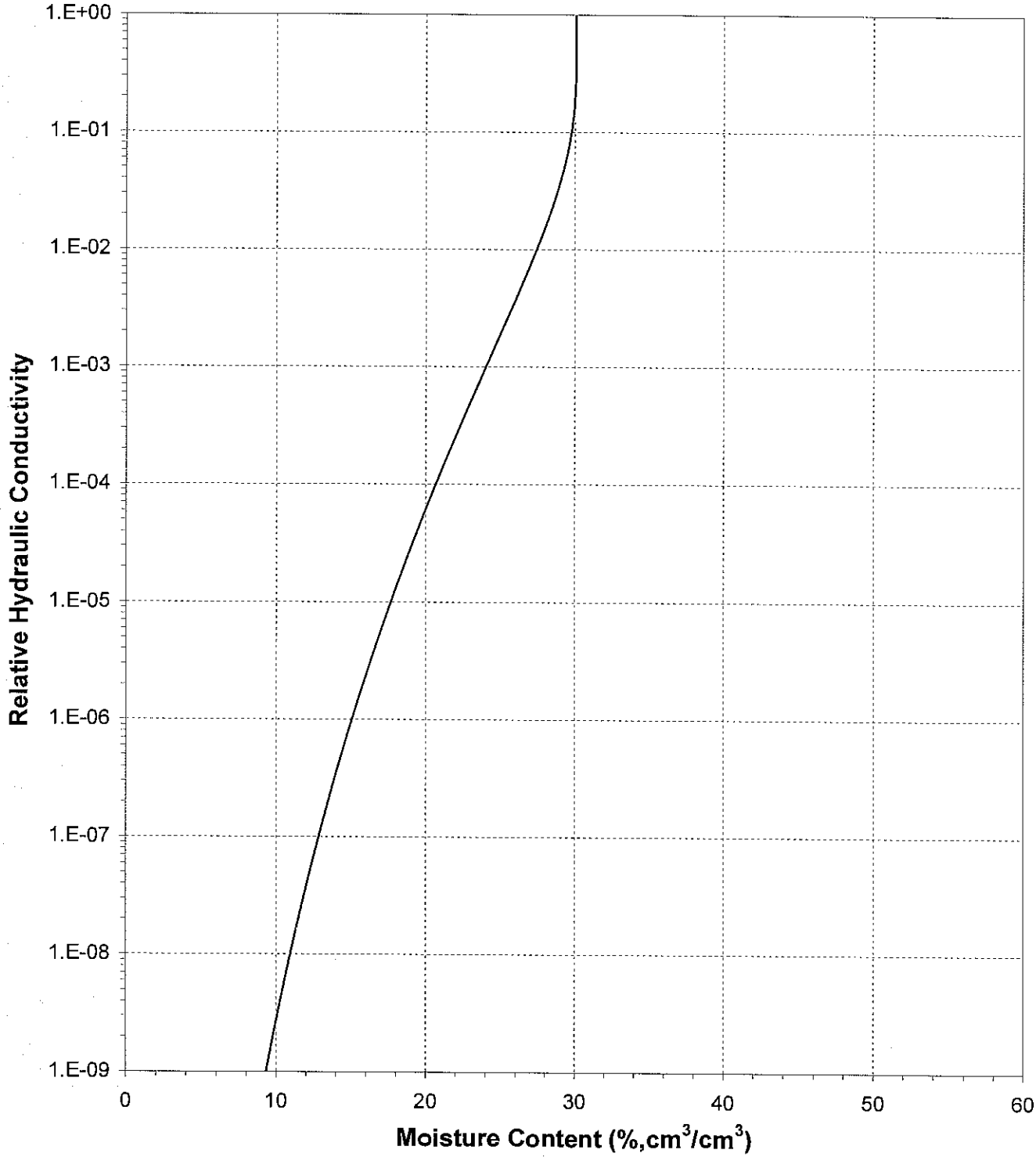
Predicted Water Retention Curve and Data Points

Sample Number: Test Plot 1B (4-5')(Gravel Corrected)



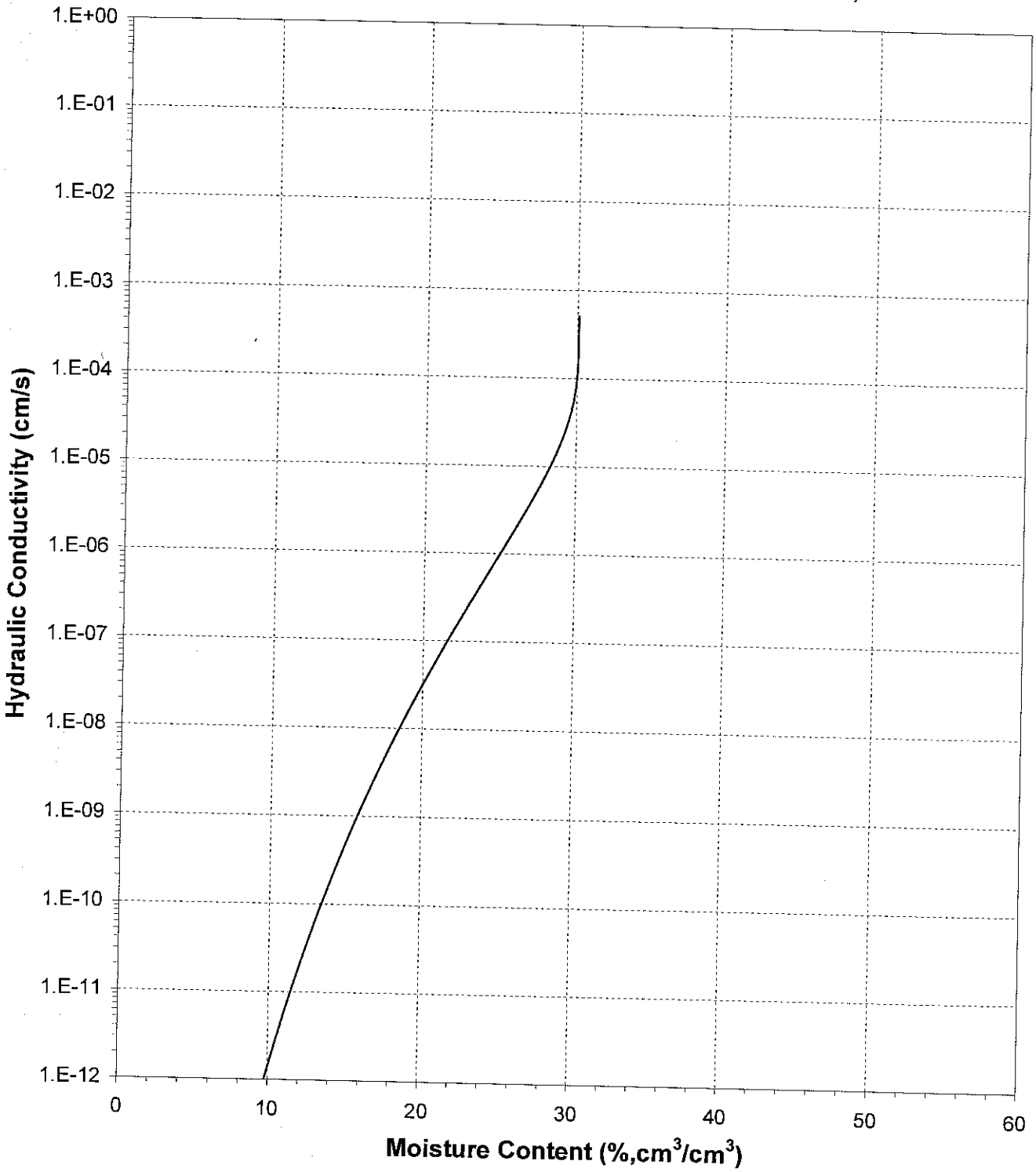
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: Test Plot 1B (4-5')(Gravel Corrected)



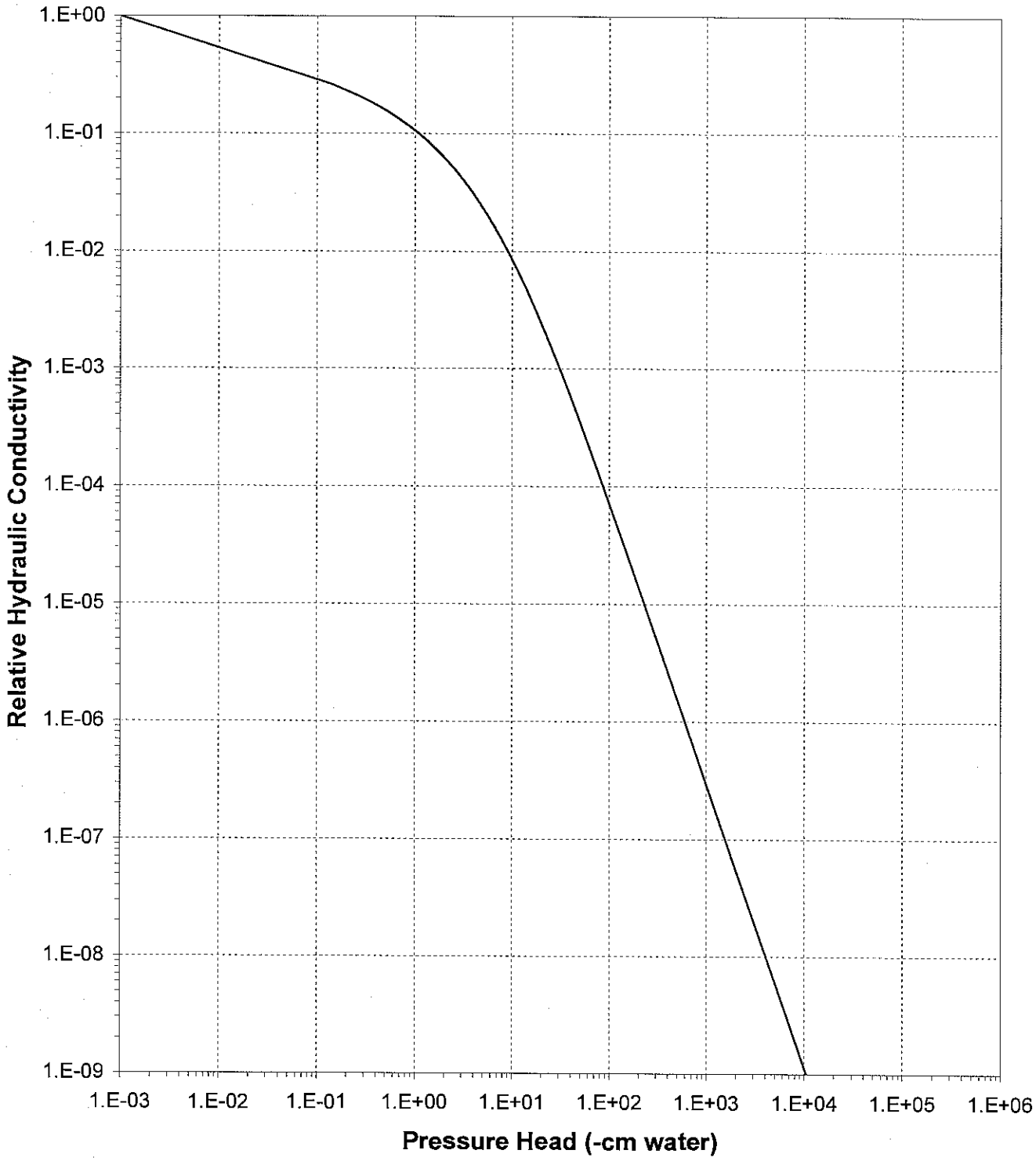
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: Test Plot 1B (4-5')(Gravel Corrected)



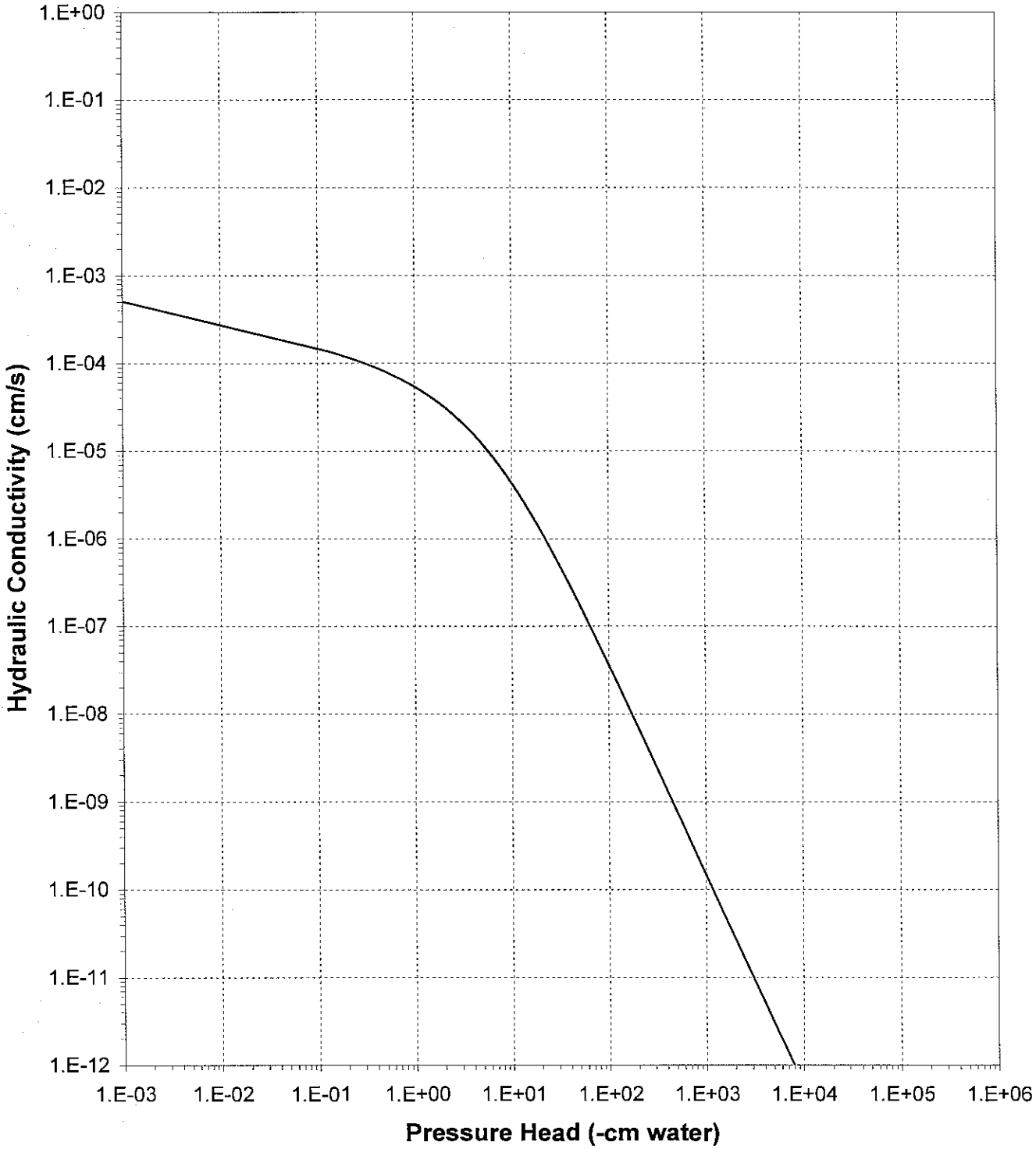
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: Test Plot 1B (4-5')(Gravel Corrected)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: Test Plot 1B (4-5')(Gravel Corrected)



Daniel B. Stephens & Associates, Inc.

Gravel Correction Data Sheet

Job name: Golder
Job number: LB05.0119.00
Sample Name/Number: Test Plot 3C (0-2)
Split: #10

Uncorrected input values		Corrected Values	
Mass (coarse)(g):	4023		
Mass (fines)(g):	2327		
Dry bulk density (fines)(g/cm^3):	1.39	Density (composite)(g/cm^3):	1.99
**Density (coarse)(g/cm^3):	2.66		
Ksat value (fines)(cm/sec):	1.6E-03	Ksat composite(cm/sec):	8.4E-04
Theta initial (fines):	0.1540	Theta initial composite:	0.0809
Theta saturated (fines):	0.4924	Theta saturated composite:	0.2587
Theta residual (fines):	0.0000	Theta residual composite:	0.0000
*Theta initial (coarse):	0		
*Theta saturated (coarse):	0		
*Theta residual (coarse):	0		
*Volume (coarse voids)(cm^3):	0		

Volumetric fraction of fines in composite: 0.525
Volumetric fraction of coarse in composite: 0.475
Volumetric fraction of voids in composite: 0.000
Volume (fines)(cm^3): 1674.10
Volume (coarse)(cm^3): 1512.41
Volume (composite)(cm^3): 3186.51

*Comments: *Values will be zero if the coarse fraction is assumed to hold no water in pores. **Density based upon specific gravity tests which assumes the coarse and fine fractions are the same material.*

Date: 18-Jul-05
Data entered by: D. O'Dowd
Checked by: J. Hines

Moisture Retention Data

Hanging Column/Pressure Plate/Thermocouple

(Main Drainage Curve)

Job Name:	Golder	*Dry wt. of sample* (g):	195.14
Job Number:	LB05.0119.00	*Tare wt., screen & clamp* (g):	25.23
Sample Number:	Test Plot 3C (0-2')(Gravel Corrected)	*Tare wt., ring* (g):	115.57
Ring Number:	NA	*Tare wt., epoxy* (g):	0.00
Depth:	NA	*Sample volume* (cm^3):	140.88

Saturated weight at 0 cm tension* (g): 404.53
Volume of water[T] in saturated sample (cm^3): 68.59
Saturated moisture content (% vol): 48.69
Sample bulk density (g/cm^3): 1.39

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content[T] (% vol)
Hanging column:	09-Jun-05 / 15:40	404.53	0.00	48.69
	15-Jun-05 / 10:12	399.92	11.00	45.42
	21-Jun-05 / 16:35	386.39	30.70	35.81
	27-Jun-05 / 15:00	380.24	76.50	31.45
Pressure plate:	03-Jul-05 / 10:25	370.87	509.90	24.79

Comments:

* Weight including tares
[T] Assumed density of water is 1.0 g/cm^3

Laboratory analysis by: T. Bowekaty
Data entered by: M. Devine
Checked by: J. Hines

Moisture Retention Data

Water Activity Meter/Relative Humidity Box

(Main Drainage Curve)

Job Name: Golder
Job Number: LB05.0119.00
Sample Number: Test Plot 3C (0-2')(Gravel Corrected)
Ring Number: NA
Depth: NA

Dry weight of water activity meter sample* (g): 137.63
Tare weight, jar (g): 112.93
Sample bulk density (g/cm^3): 1.39

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content^T (% vol)
Water Activity Meter:	23-Jun-05 / 10:45	140.45	15093.0	15.81

Dry weight of relative humidity box sample* (g): 80.74
Tare weight (g): 40.79
Sample bulk density (g/cm^3): 1.39

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content^T (% vol)
Relative humidity box:	20-Jun-05 / 14:20	81.73	851293	3.43

Comments:

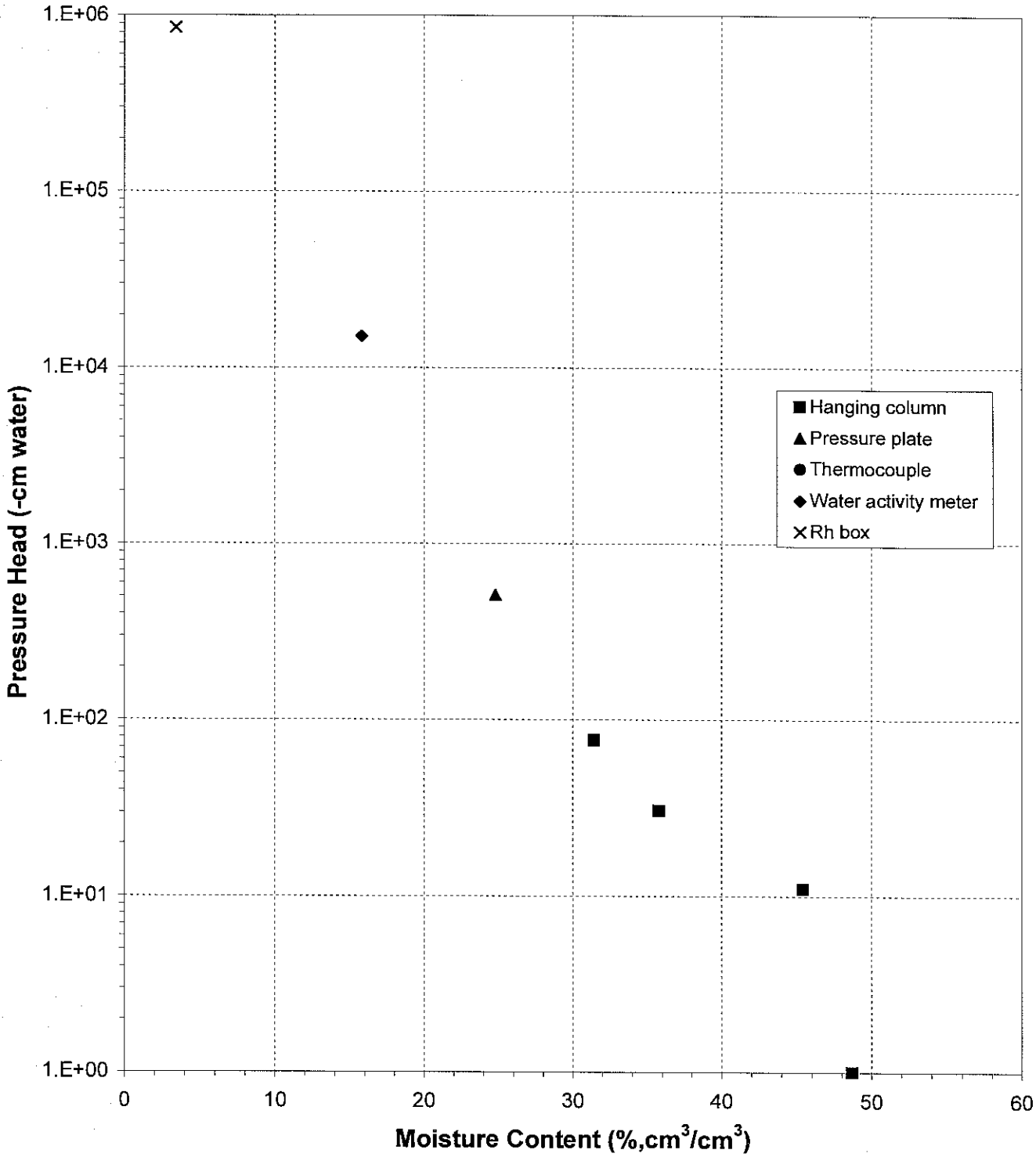
* Weight including tares

† Assumed density of water is 1.0 g/cm^3

Laboratory analysis by: M. Carrillo/S. Shannon
Data entered by: M. Devine
Checked by: J. Hines

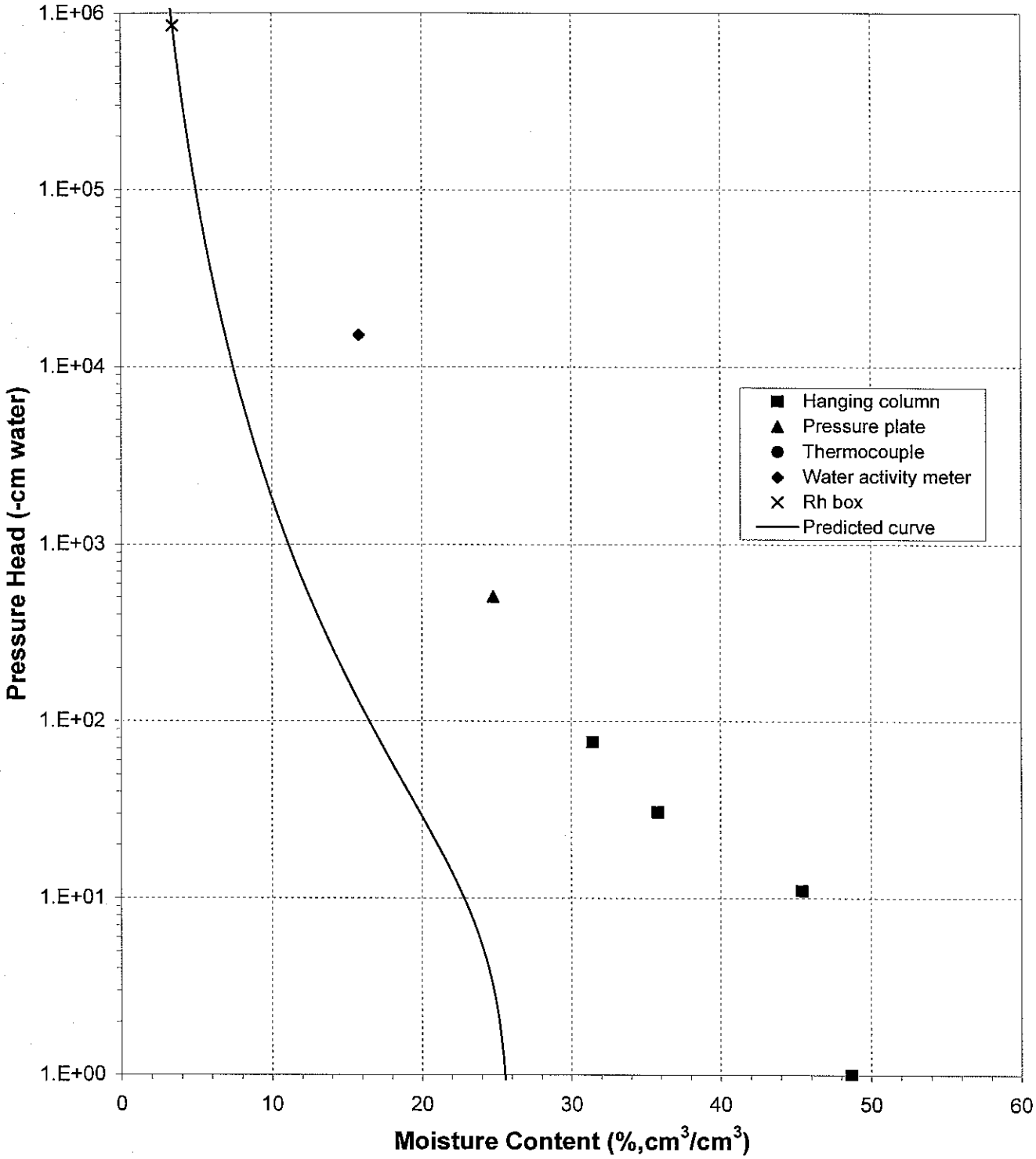
Water Retention Data Points

Sample Number: Test Plot 3C (0-2')(Gravel Corrected)



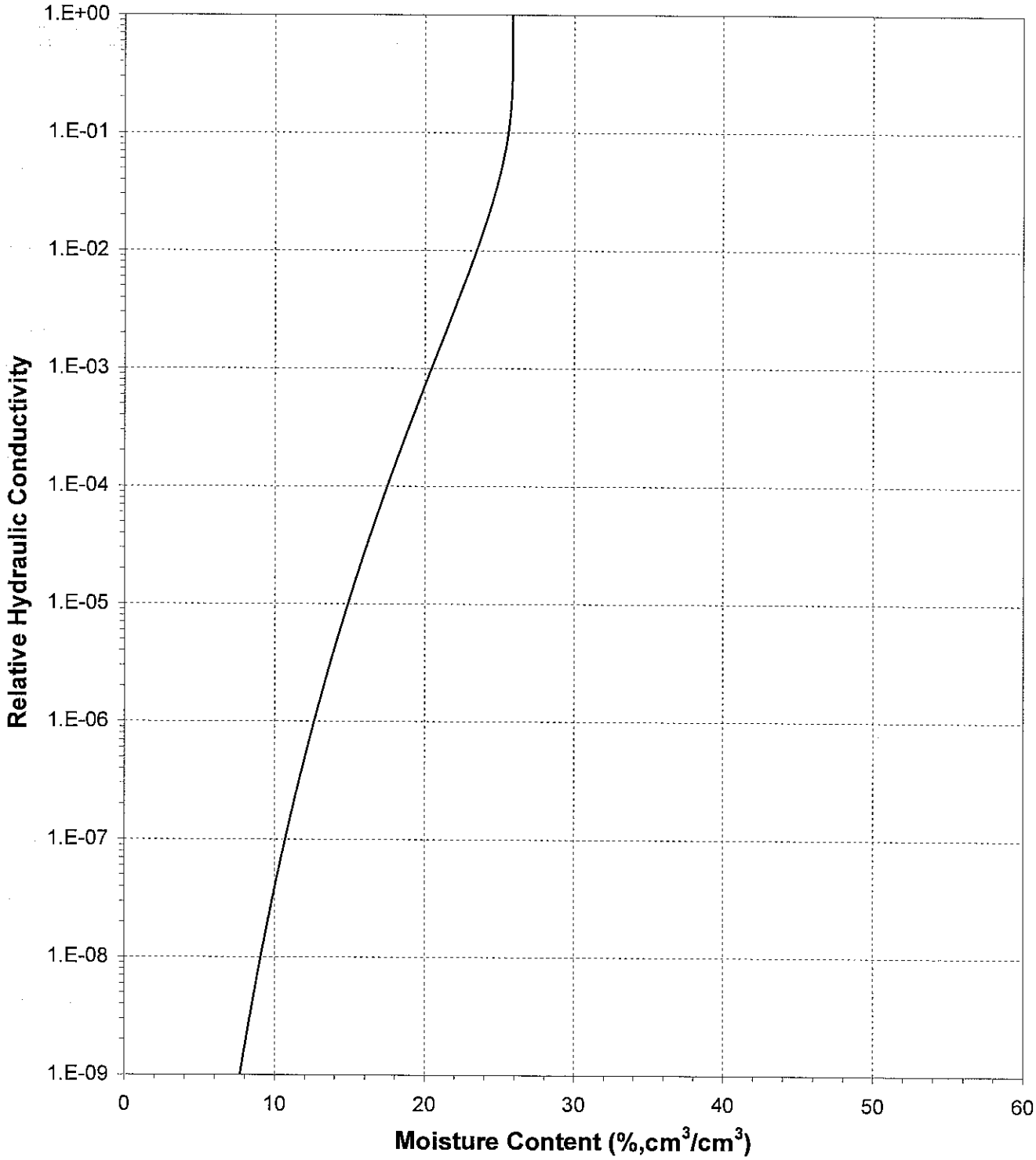
Predicted Water Retention Curve and Data Points

Sample Number: Test Plot 3C (0-2')(Gravel Corrected)



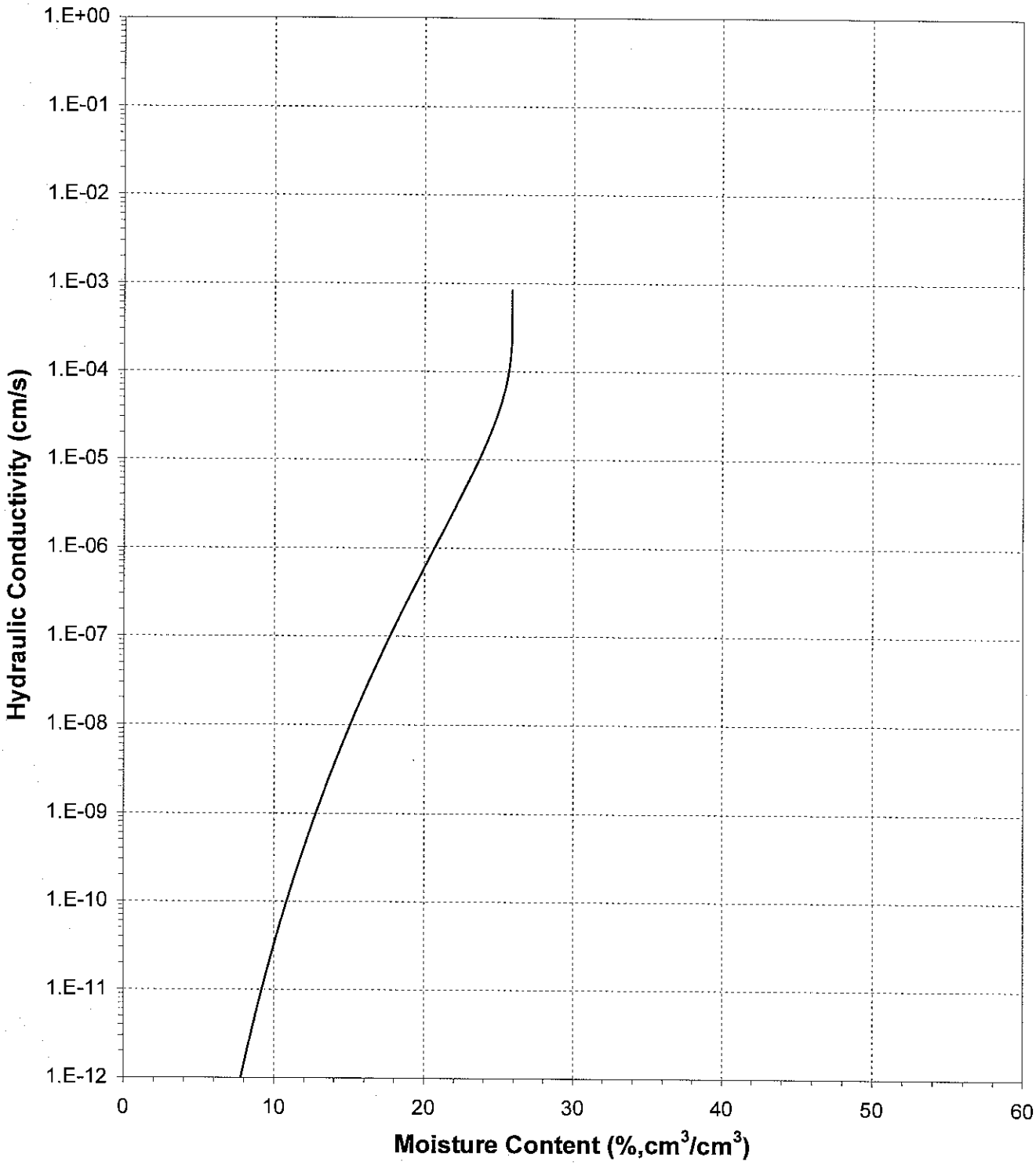
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: Test Plot 3C (0-2')(Gravel Corrected)



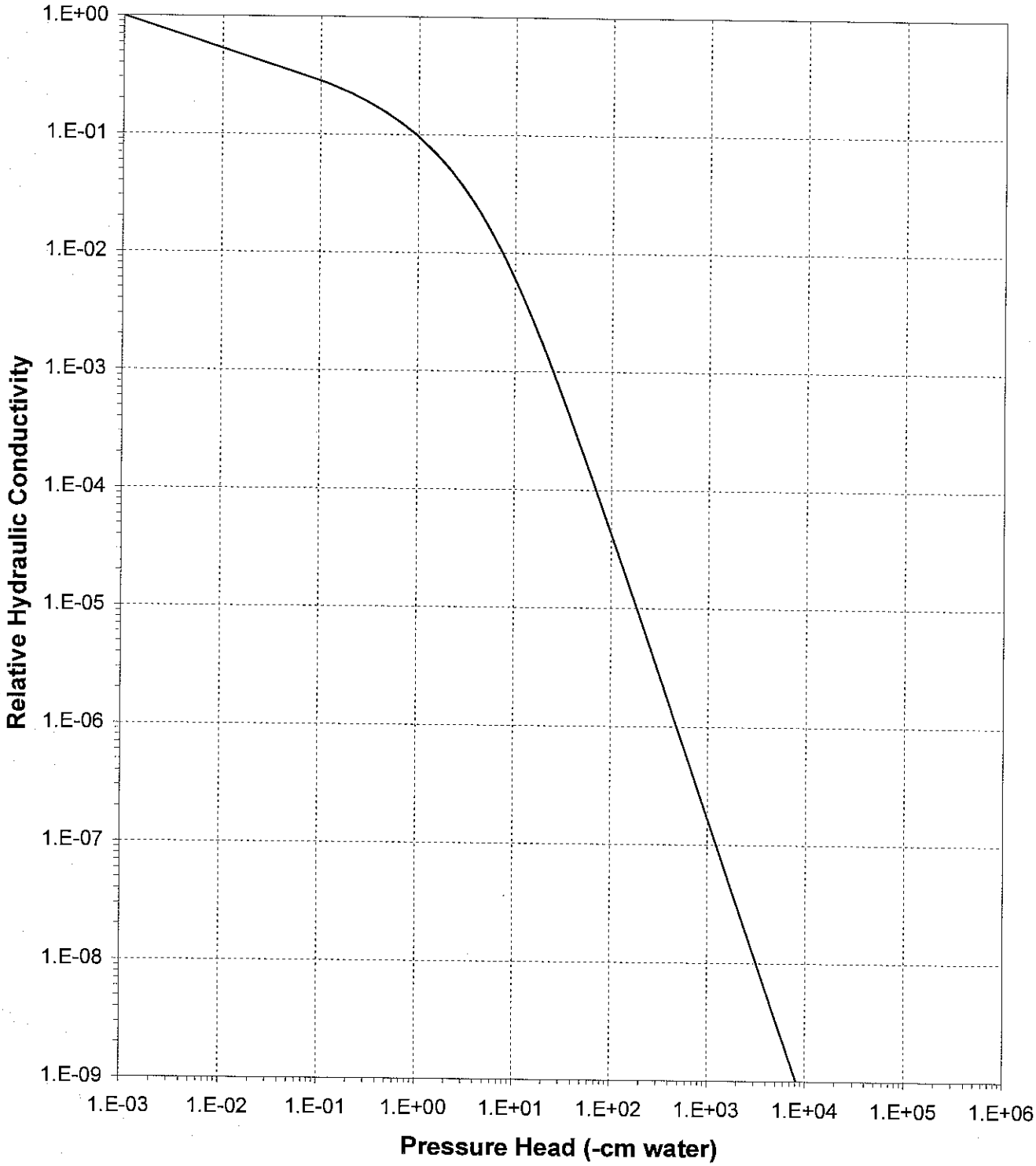
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: Test Plot 3C (0-2')(Gravel Corrected)



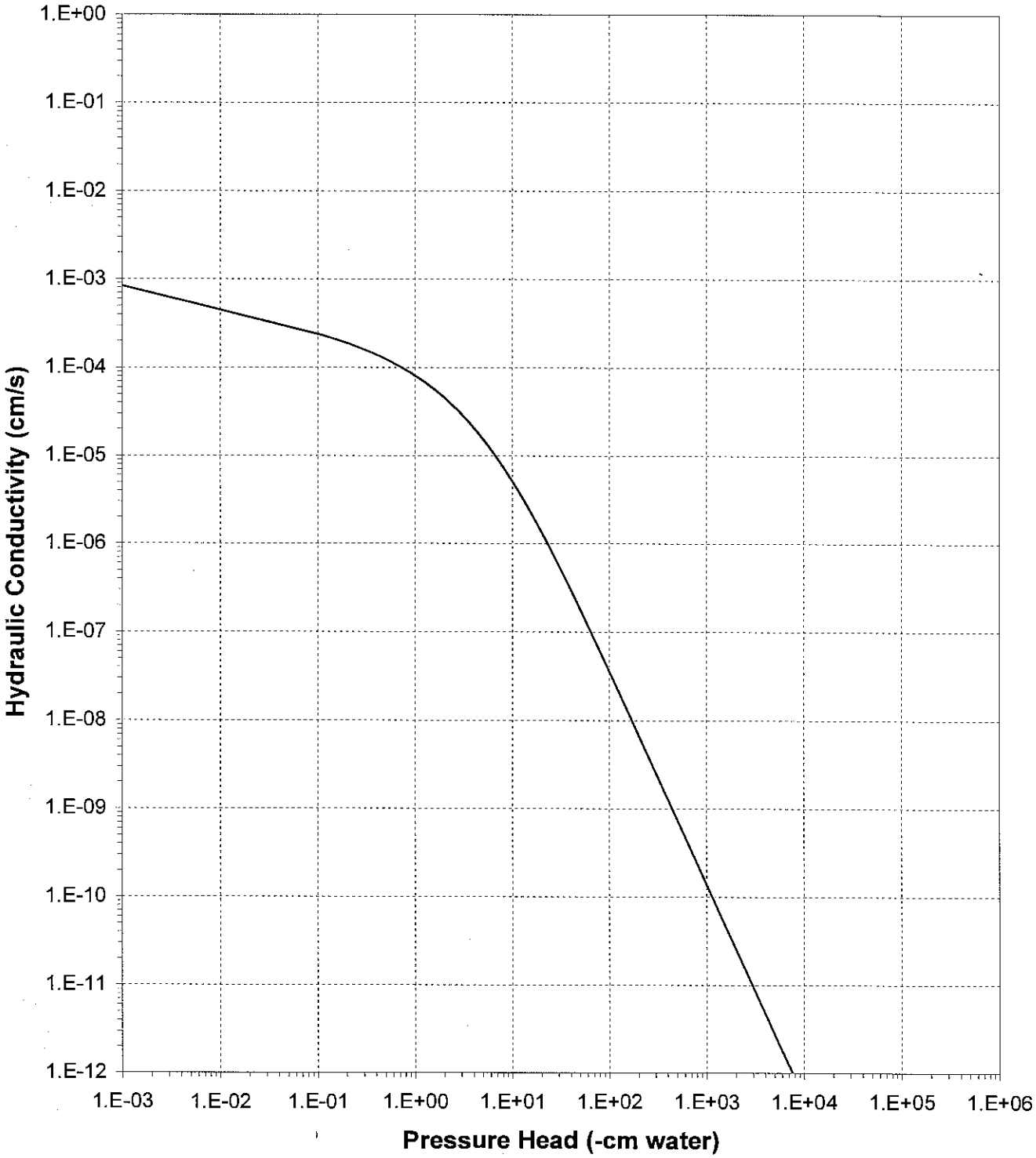
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: Test Plot 3C (0-2')(Gravel Corrected)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: Test Plot 3C (0-2')(Gravel Corrected)



Daniel B. Stephens & Associates, Inc.

Gravel Correction Data Sheet

Job name: Golder
Job number: LB05.0119.00
Sample Name/Number: Test Plot 3C (2-3)
Split: #10

Uncorrected input values		Corrected Values	
Mass (coarse)(g):	1823.5		
Mass (fines)(g):	1205.6		
Dry bulk density (fines)(g/cm^3):	1.38	Density (composite)(g/cm^3):	1.93
**Density (coarse)(g/cm^3):	2.61		
Ksat value (fines)(cm/sec):	2.5E-03	Ksat composite(cm/sec):	1.4E-03
Theta initial (fines):	0.1830	Theta initial composite:	0.1017
Theta saturated (fines):	0.4974	Theta saturated composite:	0.2764
Theta residual (fines):	0.0000	Theta residual composite:	0.0000
*Theta initial (coarse):	0		
*Theta saturated (coarse):	0		
*Theta residual (coarse):	0		
*Volume (coarse voids)(cm^3):	0		

Volumetric fraction of fines in composite: 0.556
Volumetric fraction of coarse in composite: 0.444
Volumetric fraction of voids in composite: 0.000
Volume (fines)(cm^3): 873.62
Volume (coarse)(cm^3): 698.66
Volume (composite)(cm^3): 1572.28

*Comments: *Values will be zero if the coarse fraction is assumed to hold no water in pores. **Density based upon specific gravity tests which assumes the coarse and fine fractions are the same material.*

Date: 18-Jul-05
Data entered by: D. O'Dowd
Checked by: J. Hines

Moisture Retention Data

Hanging Column/Pressure Plate/Thermocouple

(Main Drainage Curve)

Job Name:	Golder	*Dry wt. of sample* (g):	193.10
Job Number:	LB05.0119.00	*Tare wt., screen & clamp* (g):	24.86
Sample Number:	Test Plot 3C (2-3')(Gravel Corrected)	*Tare wt., ring* (g):	121.52
Ring Number:	NA	*Tare wt., epoxy* (g):	0.00
Depth:	NA	*Sample volume* (cm^3):	139.54

Saturated weight at 0 cm tension* (g): 408.96
Volume of water[T] in saturated sample (cm^3): 69.48
Saturated moisture content (% vol): 49.79
Sample bulk density (g/cm^3): 1.38

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content[T] (% vol)
Hanging column:	09-Jun-05 / 15:40	408.96	0.00	49.79
	14-Jun-05 / 11:00	401.16	9.00	44.20
	20-Jun-05 / 14:12	389.87	31.00	36.11
	27-Jun-05 / 15:50	384.35	76.00	32.16
Pressure plate:	03-Jul-05 / 10:25	375.11	509.90	25.53

Comments:

* Weight including tares
[I] Assumed density of water is 1.0 g/cm^3

Laboratory analysis by: T. Bowekaty
Data entered by: M. Devine
Checked by: J. Hines

Moisture Retention Data

Water Activity Meter/Relative Humidity Box

(Main Drainage Curve)

Job Name: Golder
Job Number: LB05.0119.00
Sample Number: Test Plot 3C (2-3')(Gravel Corrected)
Ring Number: NA
Depth: NA

Dry weight of water activity meter sample* (g): 149.62
Tare weight, jar (g): 113.38
Sample bulk density (g/cm^3): 1.38

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content^T (% vol)
Water Activity Meter:	21-Jun-05 / 12:20	153.08	16520.8	13.21

Dry weight of relative humidity box sample* (g): 73.23
Tare weight (g): 40.66
Sample bulk density (g/cm^3): 1.38

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content^T (% vol)
Relative humidity box:	20-Jun-05 / 14:20	74.02	851293	3.38

Comments:

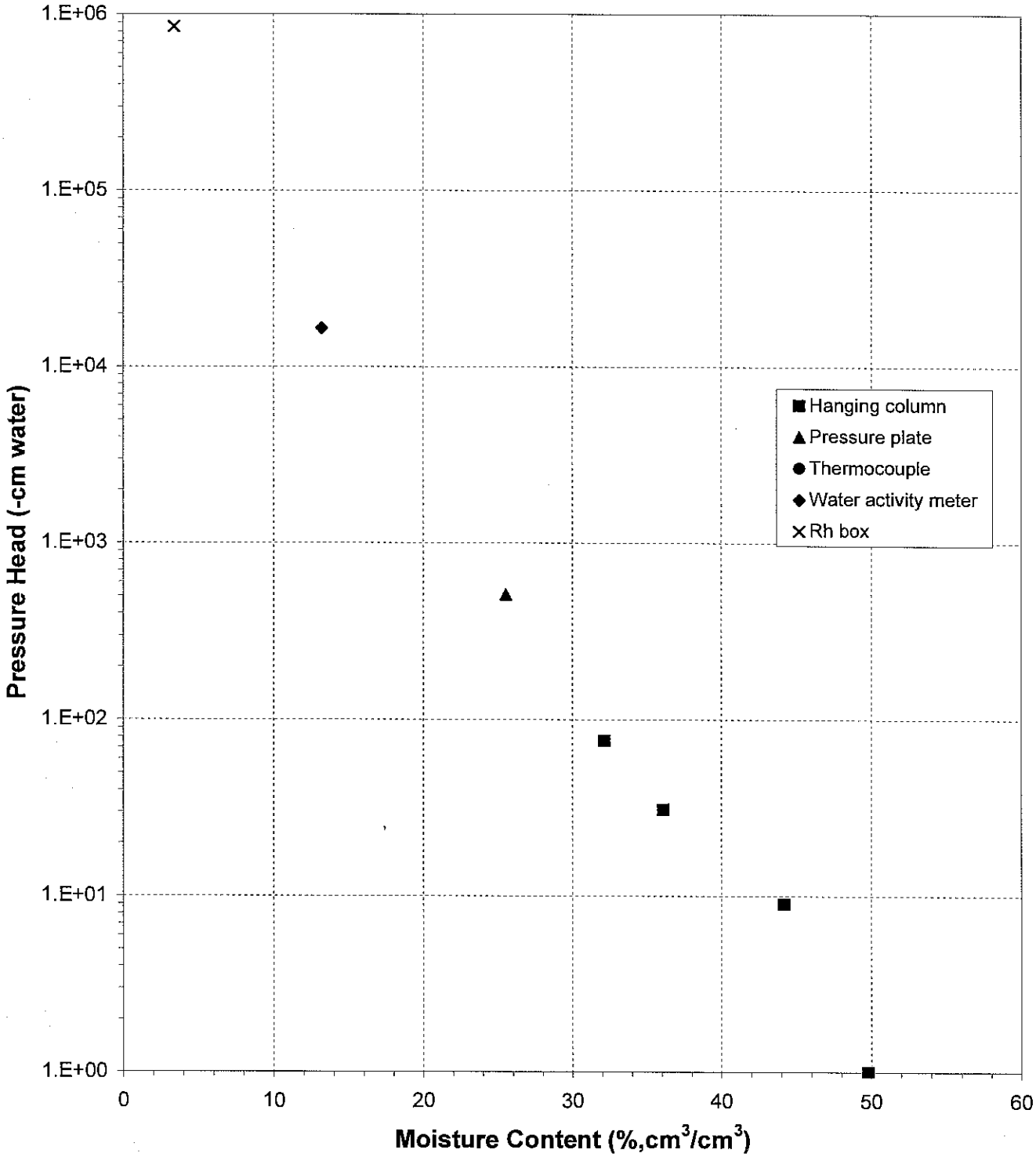
* Weight including tares

† Assumed density of water is 1.0 g/cm^3

Laboratory analysis by: D. O'Dowd/S. Shannon
Data entered by: M. Devine
Checked by: J. Hines

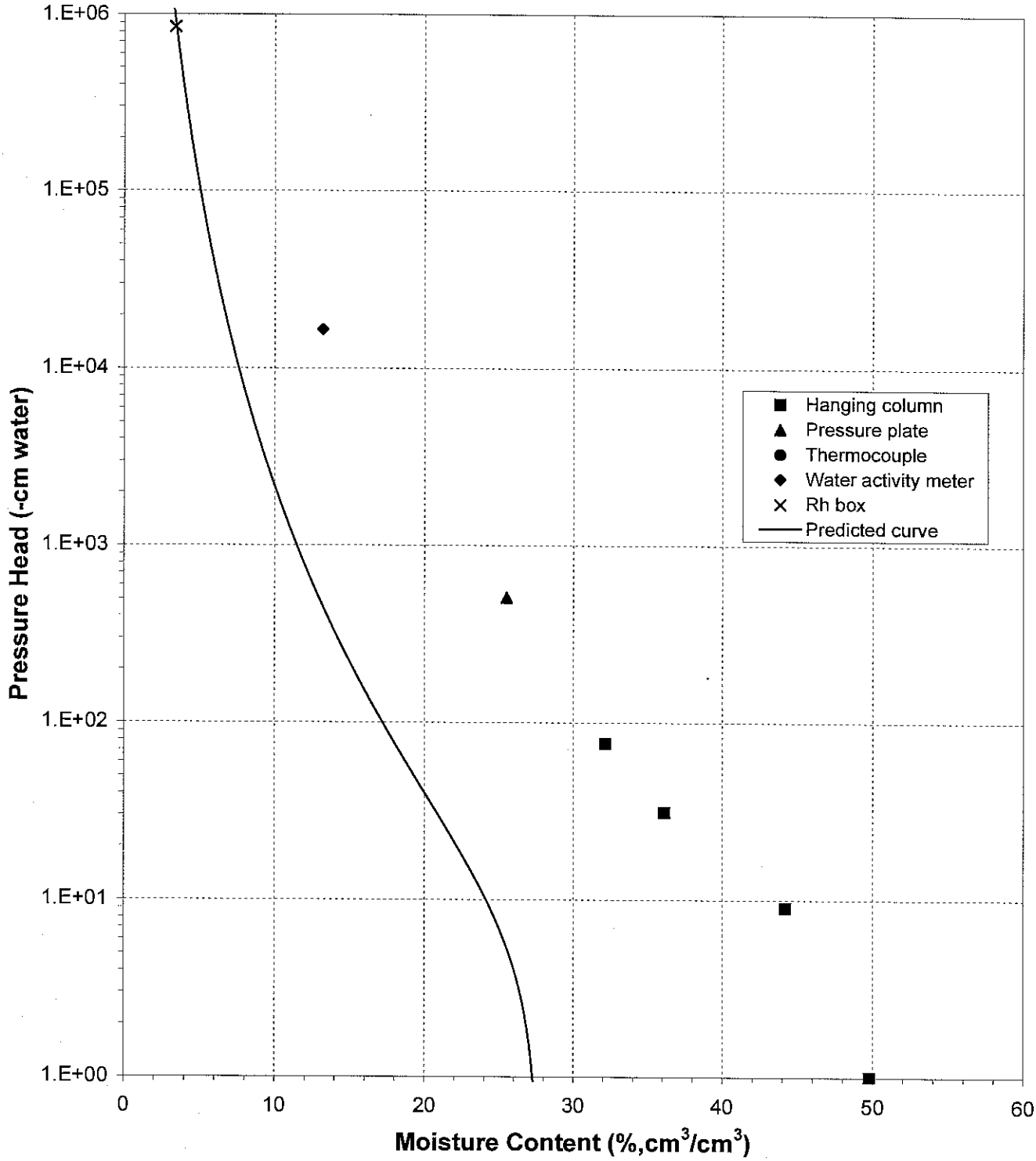
Water Retention Data Points

Sample Number: Test Plot 3C (2-3')(Gravel Corrected)



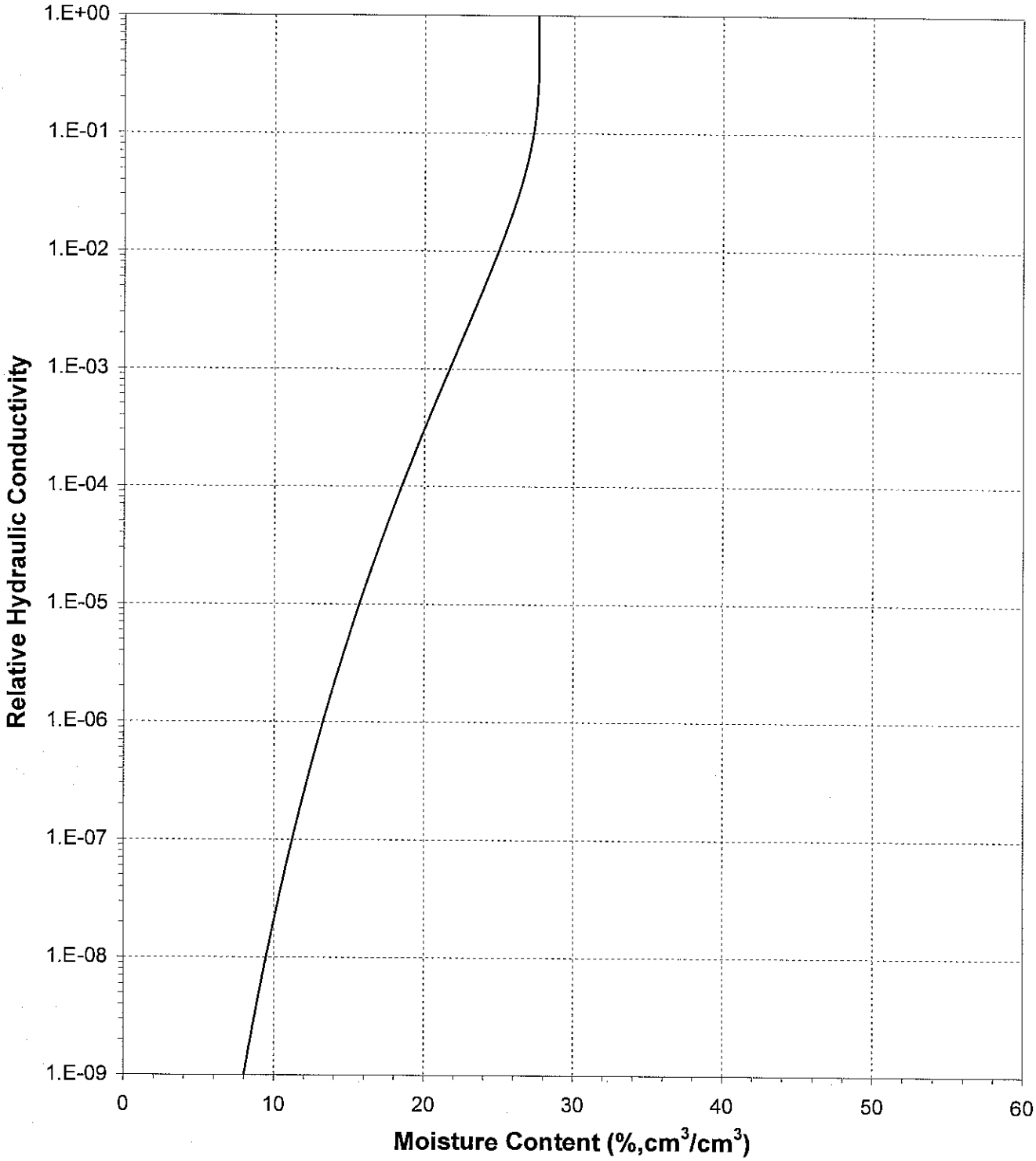
Predicted Water Retention Curve and Data Points

Sample Number: Test Plot 3C (2-3')(Gravel Corrected)



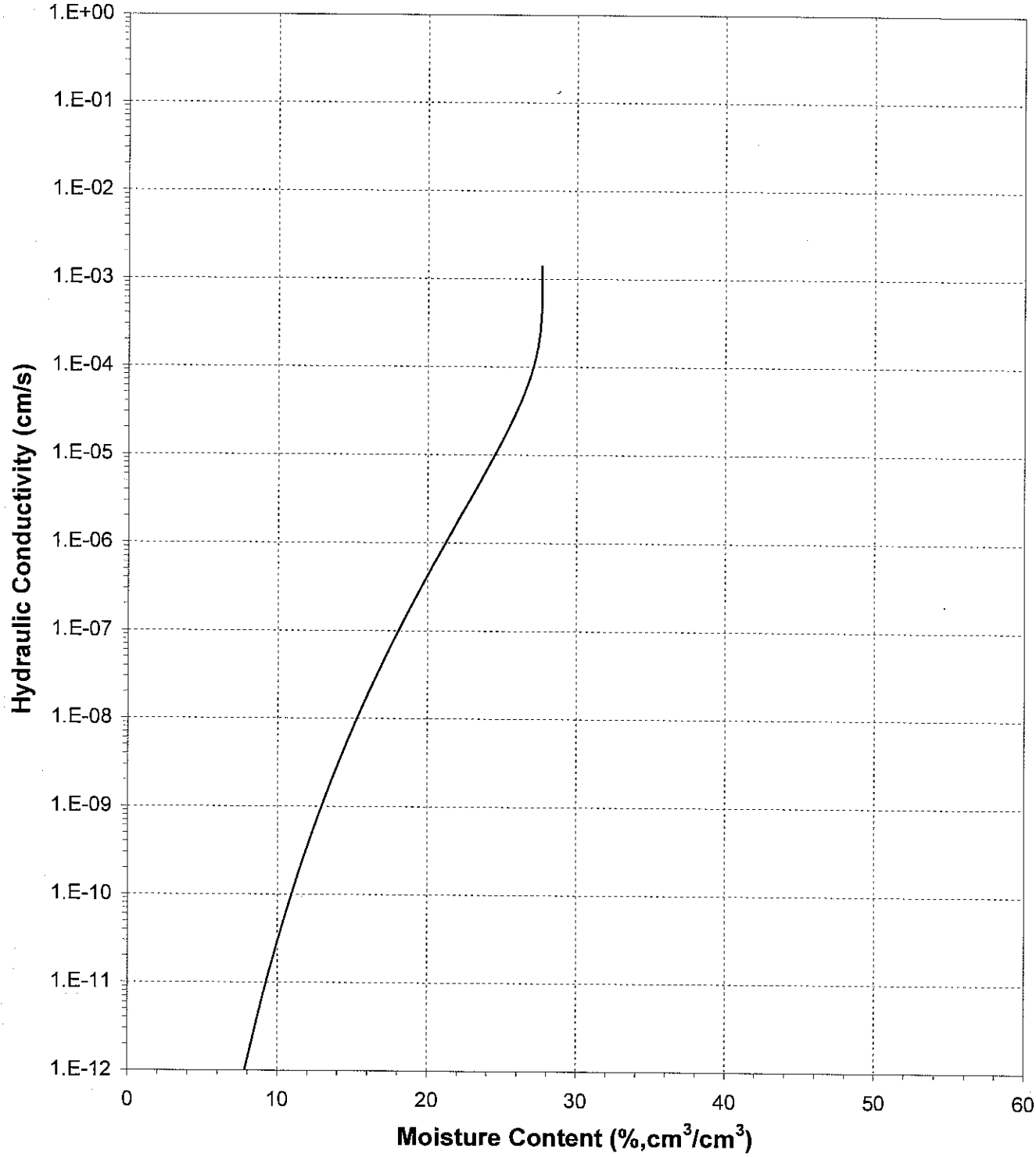
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: Test Plot 3C (2-3')(Gravel Corrected)



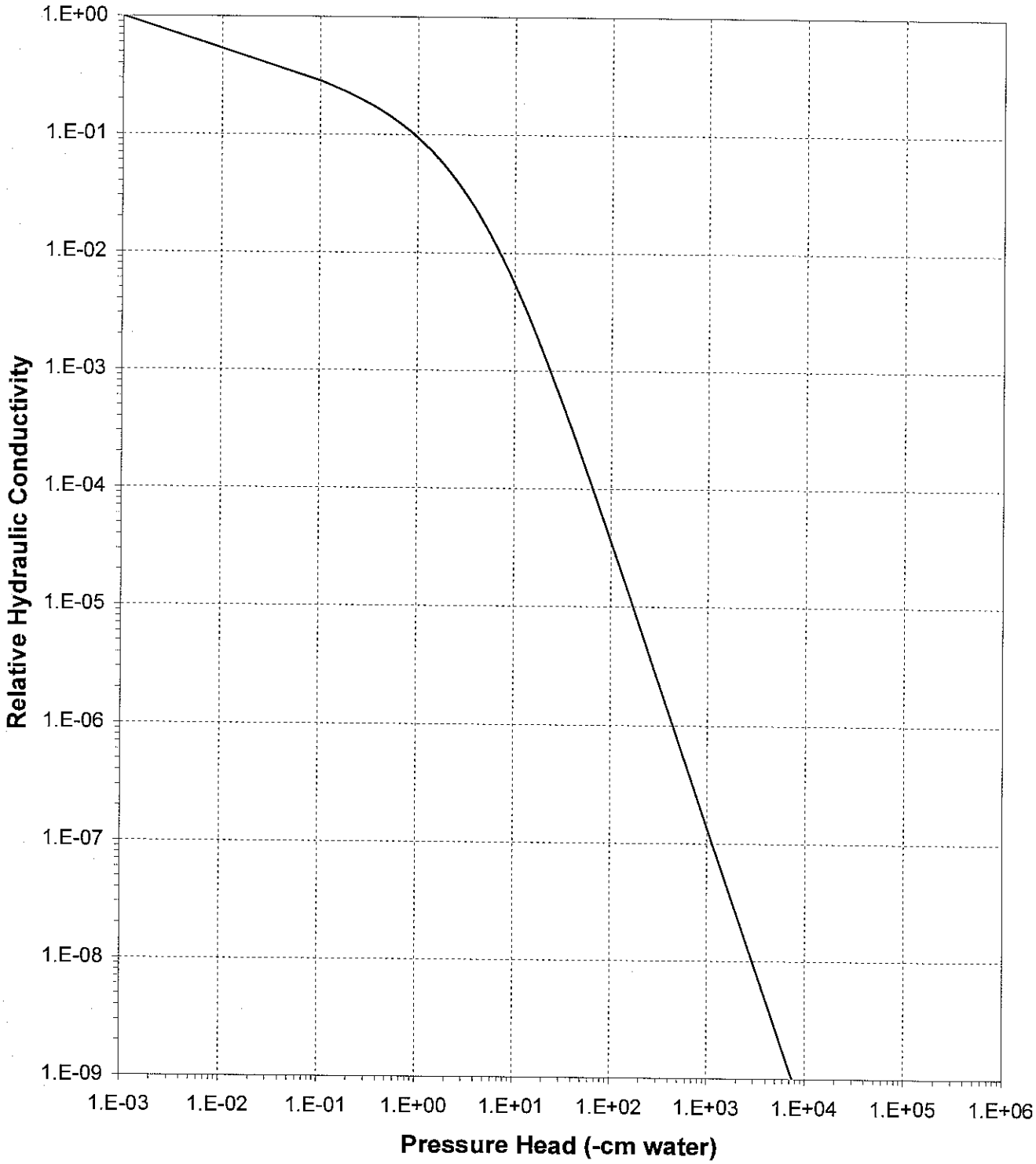
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: Test Plot 3C (2-3')(Gravel Corrected)



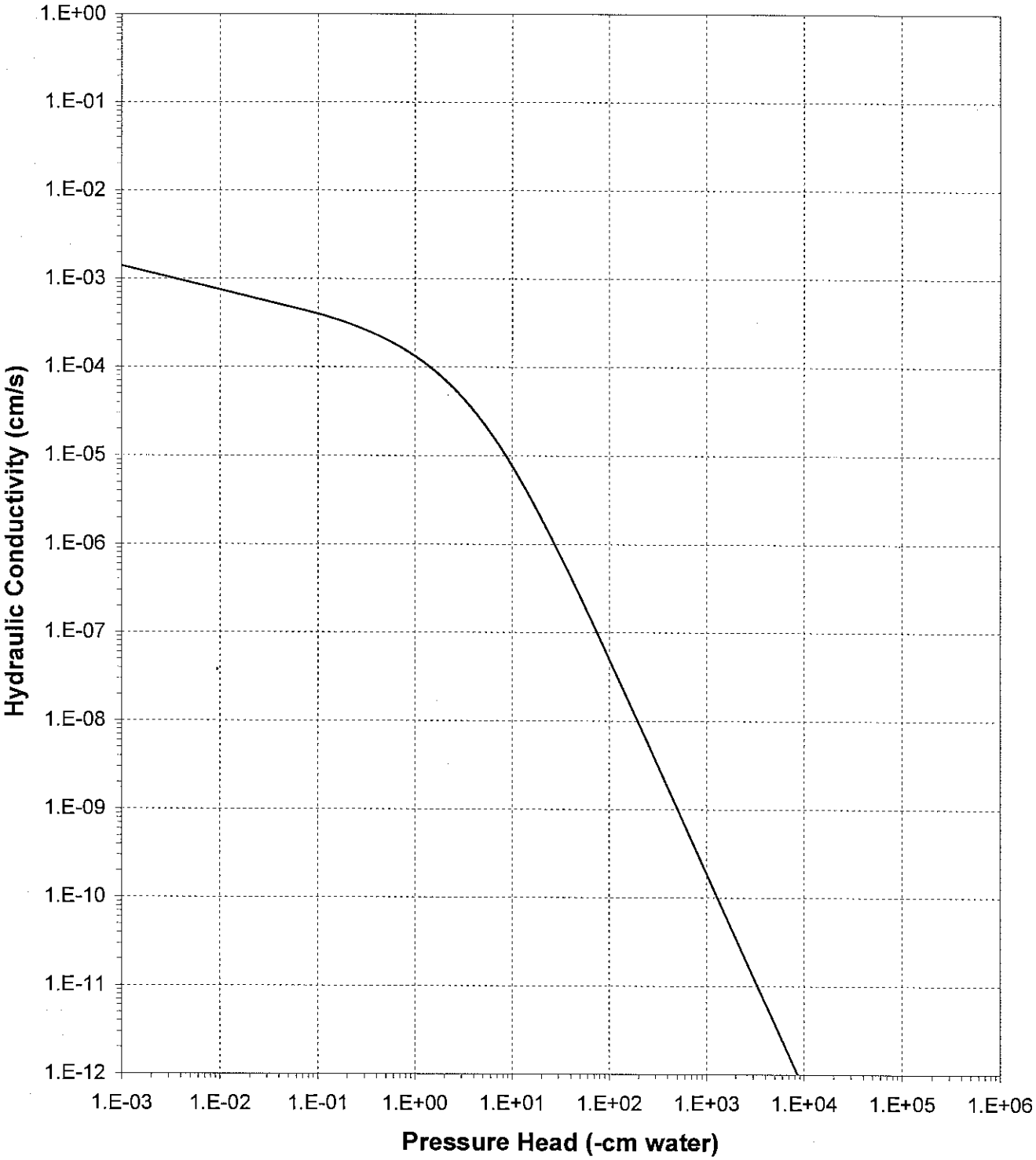
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: Test Plot 3C (2-3')(Gravel Corrected)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: Test Plot 3C (2-3')(Gravel Corrected)



Daniel B. Stephens & Associates, Inc.

Gravel Correction Data Sheet

Job name: Golder
Job number: LB05.0119.00
Sample Name/Number: Test Plot 5A (3-4)
Split: #10

Uncorrected input values		Corrected Values	
Mass (coarse)(g):	4302		
Mass (fines)(g):	3354		
Dry bulk density (fines)(g/cm^3):	1.40	Density (composite)(g/cm^3):	1.89
**Density (coarse)(g/cm^3):	2.59		
Ksat value (fines)(cm/sec):	2.7E-04	Ksat composite(cm/sec):	1.6E-04
Theta initial (fines):	0.1690	Theta initial composite:	0.0998
Theta saturated (fines):	0.4576	Theta saturated composite:	0.2702
Theta residual (fines):	0.0000	Theta residual composite:	0.0000
*Theta initial (coarse):	0		
*Theta saturated (coarse):	0		
*Theta residual (coarse):	0		
*Volume (coarse voids)(cm^3):	0		

Volumetric fraction of fines in composite: 0.591
Volumetric fraction of coarse in composite: 0.409
Volumetric fraction of voids in composite: 0.000
Volume (fines)(cm^3): 2395.71
Volume (coarse)(cm^3): 1661.00
Volume (composite)(cm^3): 4056.72

*Comments: *Values will be zero if the coarse fraction is assumed to hold no water in pores. **Density based upon specific gravity tests which assumes the coarse and fine fractions are the same material.*

Date: 18-Jul-05
Data entered by: D. O'Dowd
Checked by: J. Hines

Moisture Retention Data

Hanging Column/Pressure Plate/Thermocouple

(Main Drainage Curve)

Job Name:	Golder	*Dry wt. of sample* (g):	196.07
Job Number:	LB05.0119.00	*Tare wt., screen & clamp* (g):	25.51
Sample Number:	Test Plot 5A (3-4')(Gravel Corrected)	*Tare wt., ring* (g):	121.92
Ring Number:	NA	*Tare wt., epoxy* (g):	0.00
Depth:	NA	*Sample volume* (cm^3):	140.19

Saturated weight at 0 cm tension* (g):	408.36
Volume of water[T] in saturated sample (cm^3):	64.86
Saturated moisture content (% vol):	46.23
Sample bulk density (g/cm^3):	1.40

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content[T] (% vol)
Hanging column:	13-Jun-05 / 10:15	408.31	0.00	46.23
	20-Jun-05 / 13:15	397.74	22.20	38.69
	27-Jun-05 / 13:50	391.49	51.00	34.23
	03-Jul-05 / 10:50	386.60	124.00	30.75
Pressure plate:	09-Jul-05 / 11:45	379.47	509.90	25.66

Comments:

* Weight including tares

[1] Assumed density of water is 1.0 g/cm^3

Laboratory analysis by: M. Carrillo
Data entered by: D. O'Dowd
Checked by: J. Hines

Moisture Retention Data

Water Activity Meter/Relative Humidity Box

(Main Drainage Curve)

Job Name: Golder
Job Number: LB05.0119.00
Sample Number: Test Plot 5A (3-4')(Gravel Corrected)
Ring Number: NA
Depth: NA

Dry weight of water activity meter sample* (g): 135.88
Tare weight, jar (g): 112.63
Sample bulk density (g/cm^3): 1.40

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content^T (% vol)
Water Activity Meter:	21-Jun-05 / 13:05	137.85	16520.8	11.85

Dry weight of relative humidity box sample* (g): 71.49
Tare weight (g): 36.88
Sample bulk density (g/cm^3): 1.40

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content^T (% vol)
Relative humidity box:	20-Jun-05 / 14:20	72.21	851293	2.92

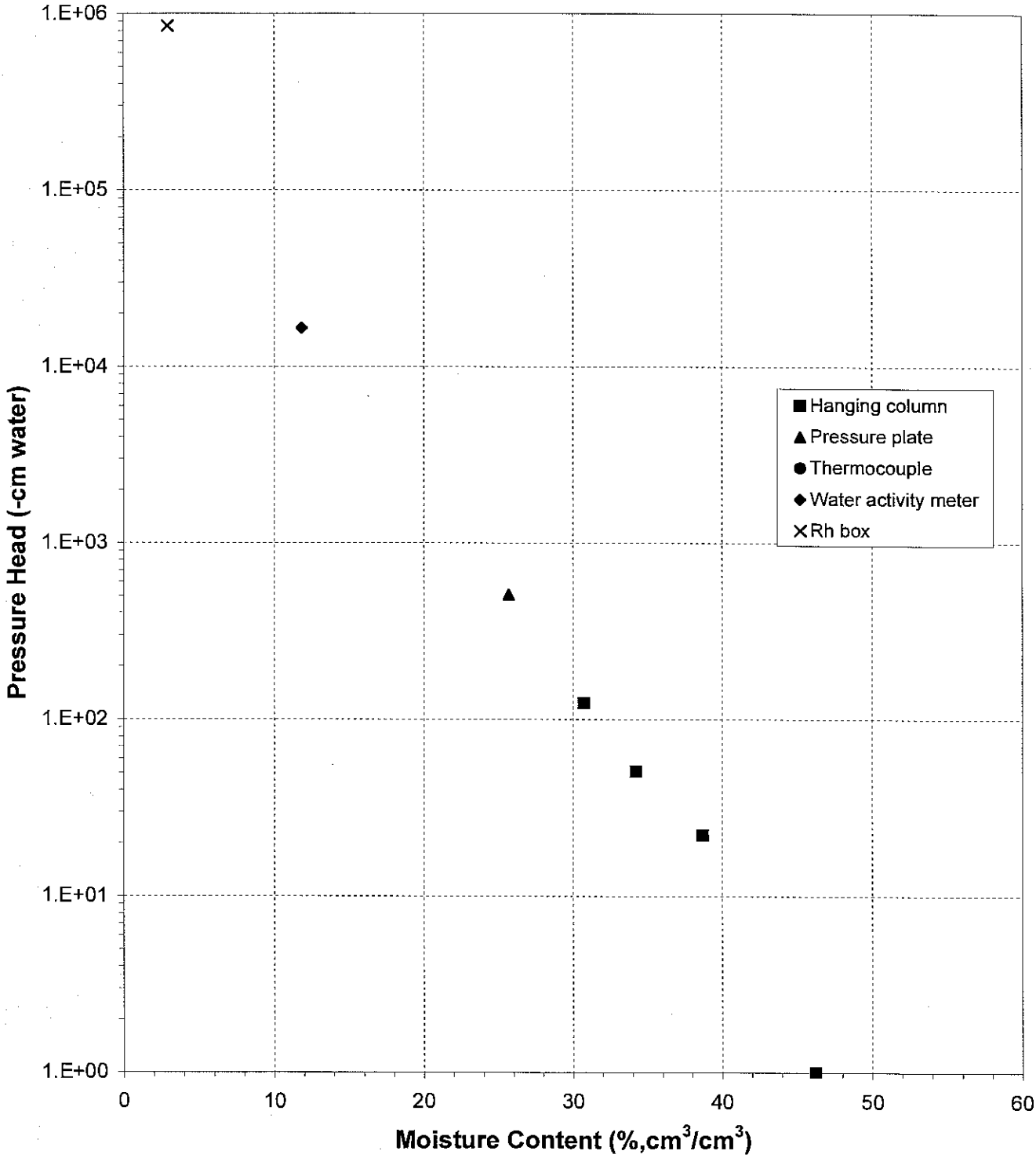
Comments:

* Weight including tares
^{T} Assumed density of water is 1.0 g/cm^3

Laboratory analysis by: D. O'Dowd/S. Shannon
Data entered by: D. O'Dowd
Checked by: J. Hines

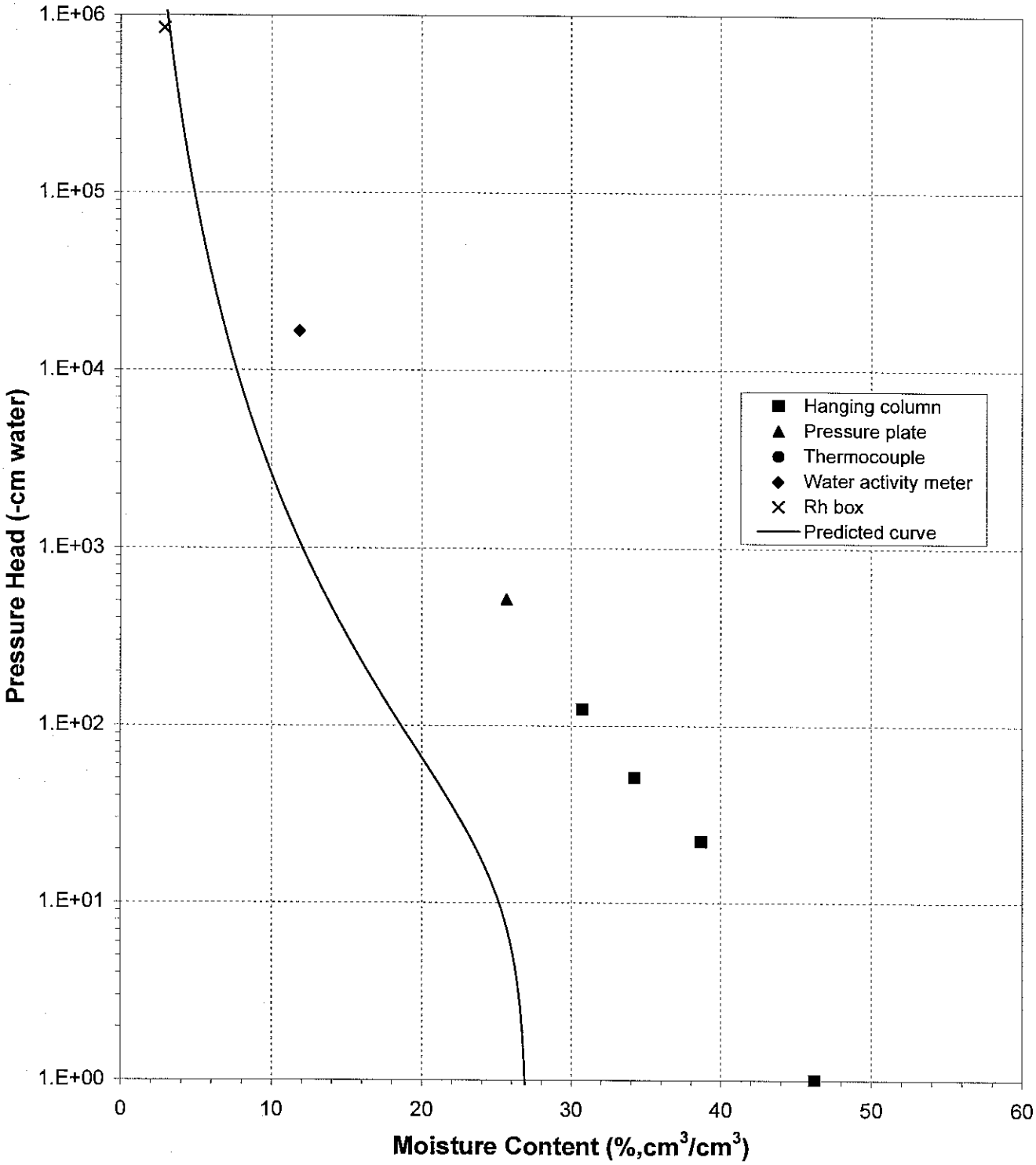
Water Retention Data Points

Sample Number: Test Plot 5A (3-4')(Gravel Corrected)



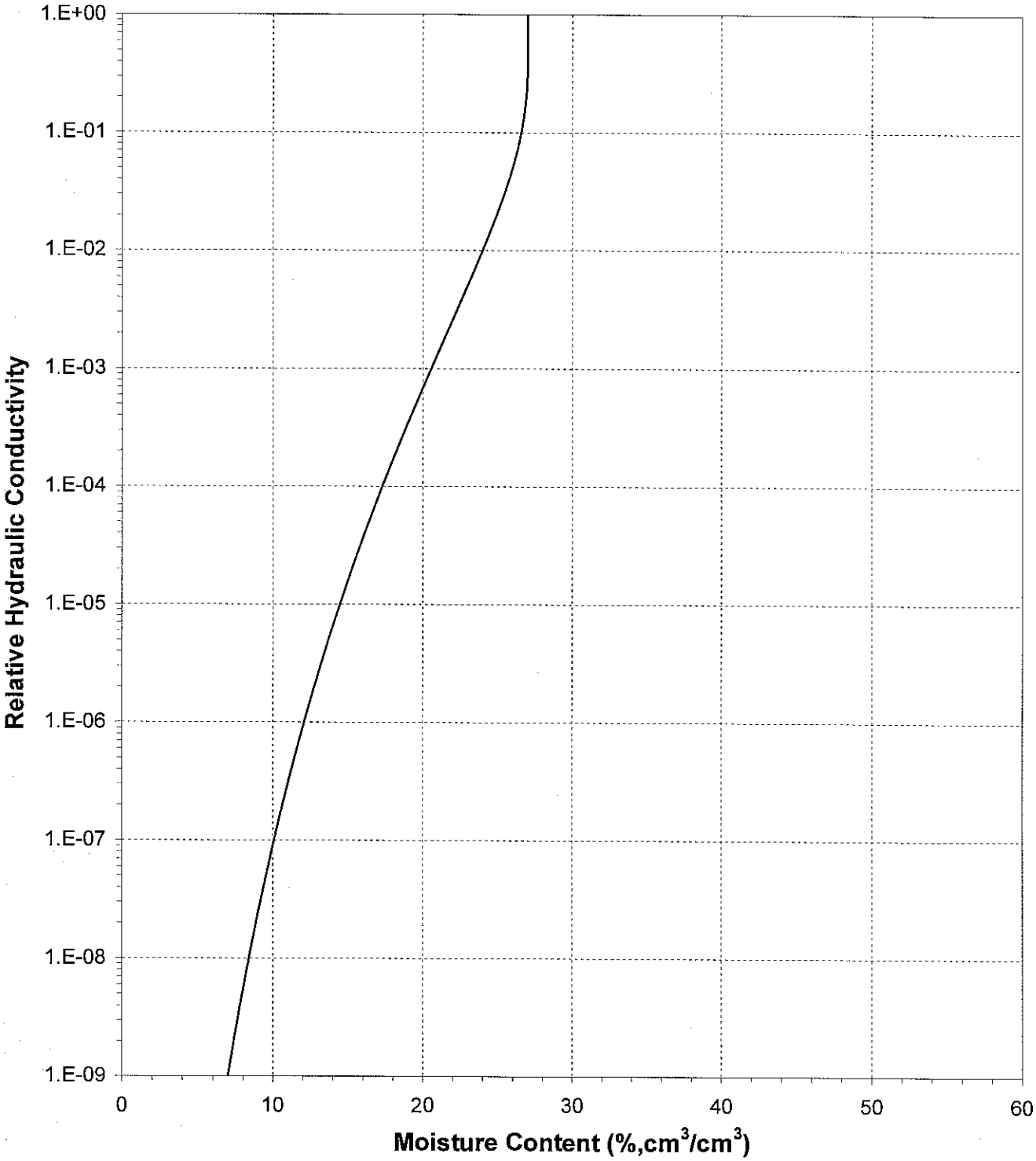
Predicted Water Retention Curve and Data Points

Sample Number: Test Plot 5A (3-4')(Gravel Corrected)



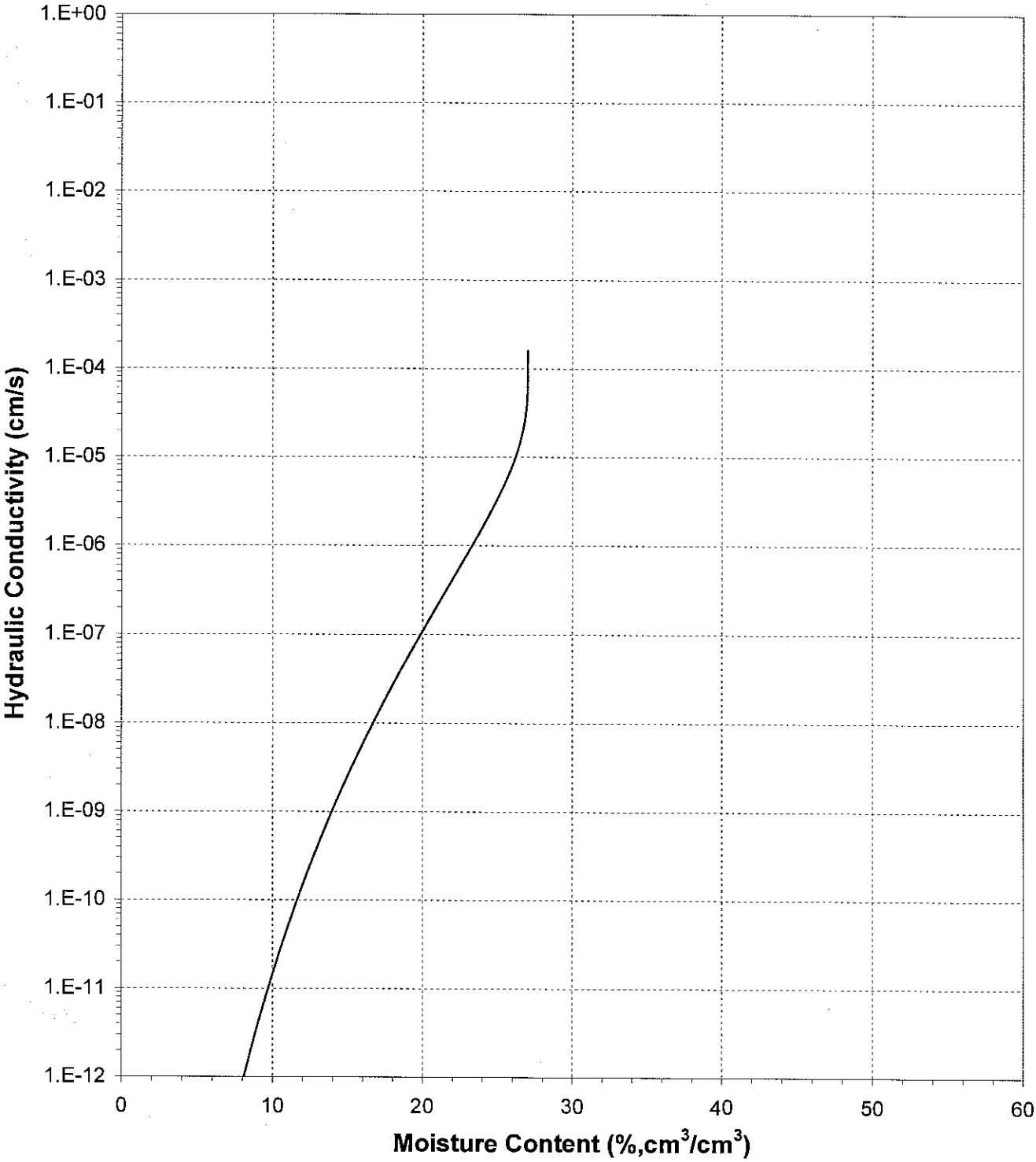
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: Test Plot 5A (3-4')(Gravel Corrected)



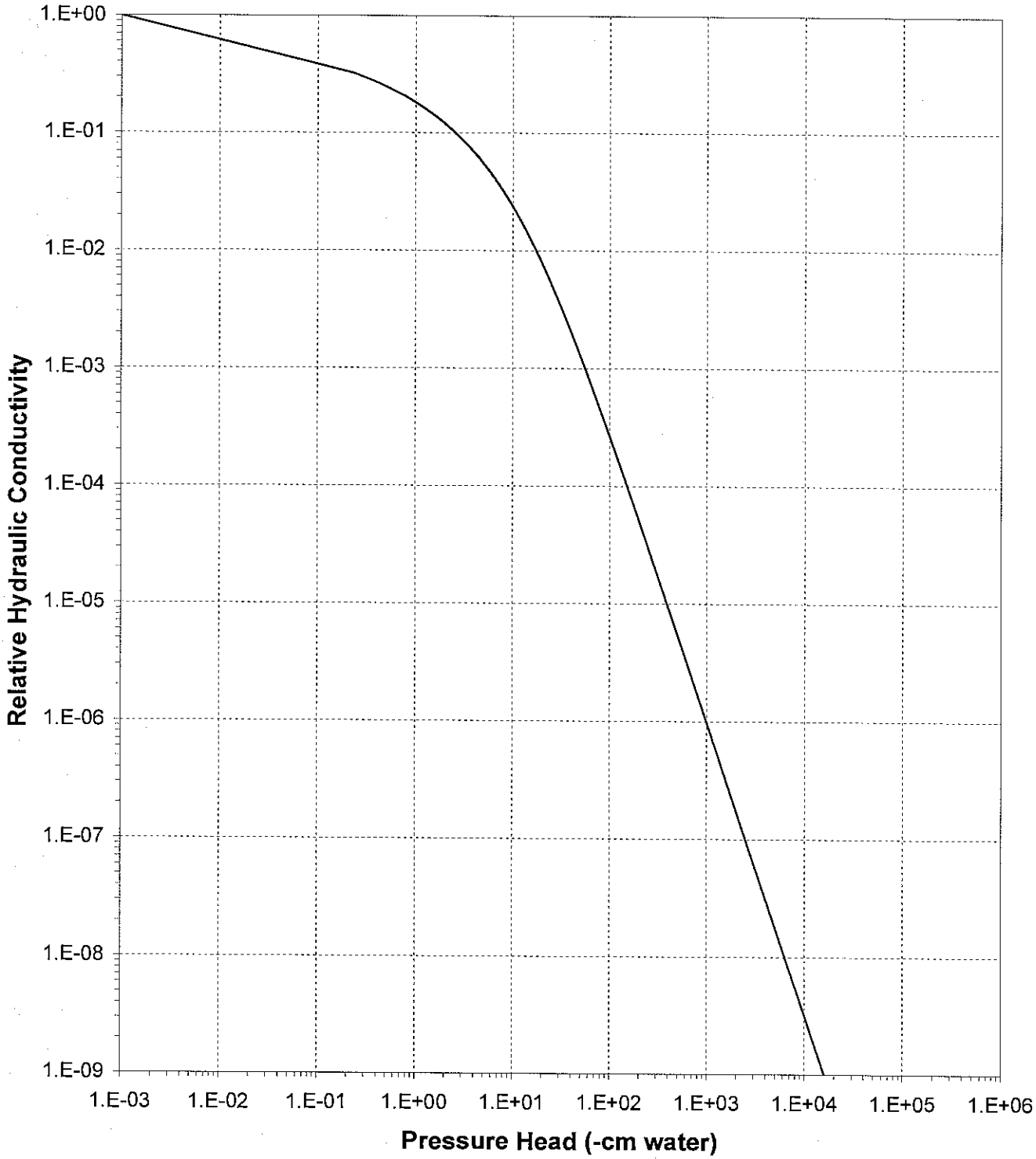
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: Test Plot 5A (3-4')(Gravel Corrected)



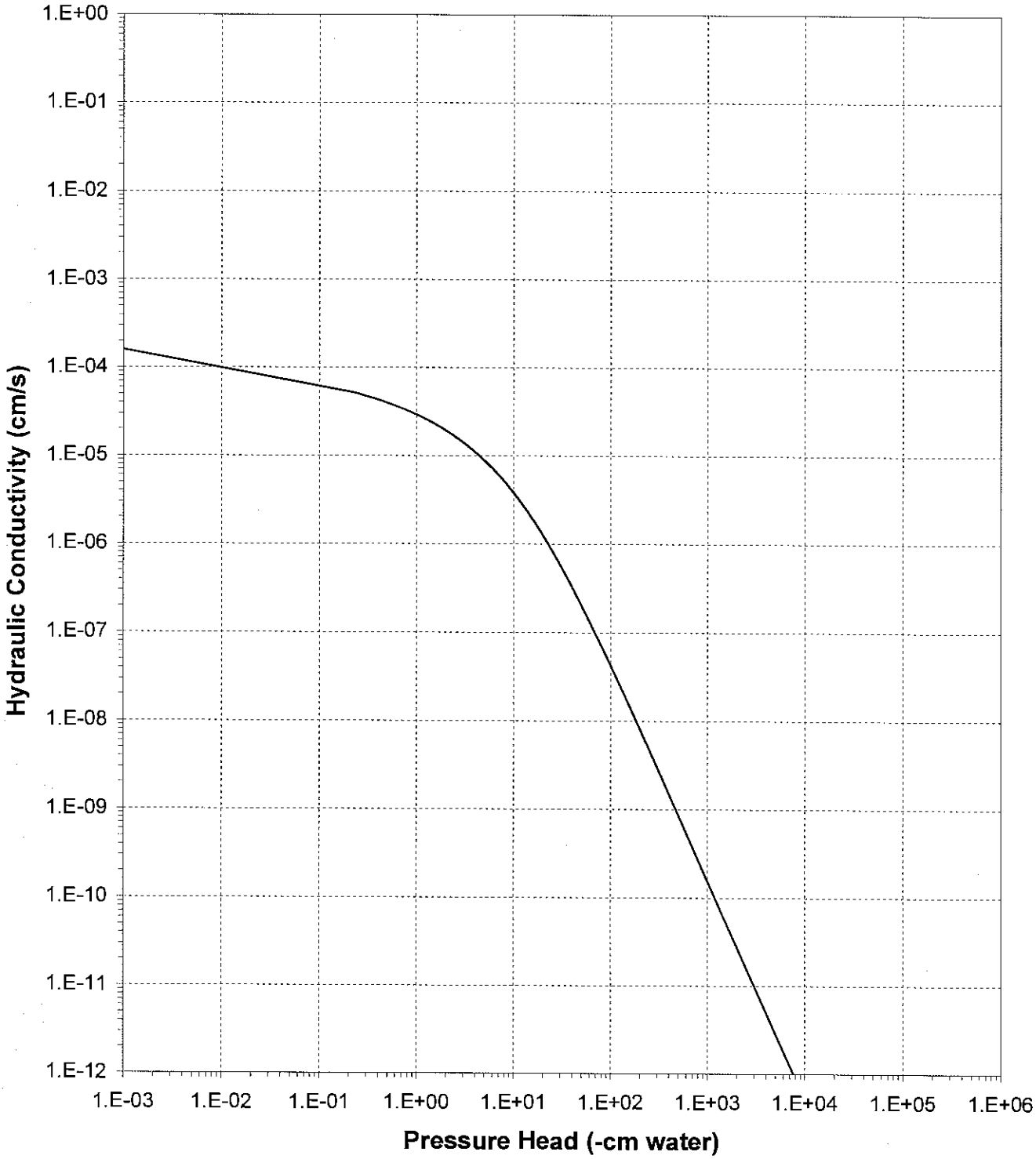
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: Test Plot 5A (3-4')(Gravel Corrected)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: Test Plot 5A (3-4')(Gravel Corrected)



Daniel B. Stephens & Associates, Inc.

Gravel Correction Data Sheet

Job name: Golder
Job number: LB05.0119.00
Sample Name/Number: Test Plot 7A (0-2)
Split: #10

Uncorrected input values		Corrected Values	
Mass (coarse)(g):	8100		
Mass (fines)(g):	2546		
Dry bulk density (fines)(g/cm^3):	1.40	Density (composite)(g/cm^3):	2.18
**Density (coarse)(g/cm^3):	2.64		
Ksat value (fines)(cm/sec):	1.9E-04	Ksat composite(cm/sec):	7.1E-05
Theta initial (fines):	0.1690	Theta initial composite:	0.0629
Theta saturated (fines):	0.4523	Theta saturated composite:	0.1683
Theta residual (fines):	0.0000	Theta residual composite:	0.0000
*Theta initial (coarse):	0		
*Theta saturated (coarse):	0		
*Theta residual (coarse):	0		
*Volume (coarse voids)(cm^3):	0		

Volumetric fraction of fines in composite: 0.372
Volumetric fraction of coarse in composite: 0.628
Volumetric fraction of voids in composite: 0.000
Volume (fines)(cm^3): 1818.57
Volume (coarse)(cm^3): 3068.18
Volume (composite)(cm^3): 4886.75

*Comments: *Values will be zero if the coarse fraction is assumed to hold no water in pores. **Density based upon specific gravity tests which assumes the coarse and fine fractions are the same material.*

Date: 18-Jul-05
Data entered by: D. O'Dowd
Checked by: J. Hines

Moisture Retention Data

Hanging Column/Pressure Plate/Thermocouple

(Main Drainage Curve)

Job Name:	Golder	*Dry wt. of sample* (g):	196.76
Job Number:	LB05.0119.00	*Tare wt., screen & clamp* (g):	24.78
Sample Number:	Test Plot 7A (0-2')(Gravel Corrected)	*Tare wt., ring* (g):	116.03
Ring Number:	NA	*Tare wt., epoxy* (g):	0.00
Depth:	NA	*Sample volume* (cm^3):	140.71

Saturated weight at 0 cm tension* (g): 401.75
Volume of water[1] in saturated sample (cm^3): 64.18
Saturated moisture content (% vol): 45.61
Sample bulk density (g/cm^3): 1.40

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content[1] (% vol)
Hanging column:	13-Jun-05 / 14:36	401.75	0.00	45.61
	20-Jun-05 / 13:15	393.98	22.20	40.09
	27-Jun-05 / 13:45	387.04	51.00	35.16
	03-Jul-05 / 10:50	381.46	124.00	31.19
Pressure plate:	09-Jul-05 / 11:45	374.93	509.90	26.55

Comments:

* Weight including tares
[1] Assumed density of water is 1.0 g/cm^3

Laboratory analysis by: M. Carrillo
Data entered by: D. O'Dowd
Checked by: J. Hines

Moisture Retention Data

Water Activity Meter/Relative Humidity Box

(Main Drainage Curve)

Job Name: Golder
Job Number: LB05.0119.00
Sample Number: Test Plot 7A (0-2')(Gravel Corrected)
Ring Number: NA
Depth: NA

Dry weight of water activity meter sample* (g): 136.72
Tare weight, jar (g): 113.20
Sample bulk density (g/cm^3): 1.40

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content^T (% vol)
Water Activity Meter:	22-Jun-05 / 11:37	139.12	9076.2	14.27

Dry weight of relative humidity box sample* (g): 69.80
Tare weight (g): 39.93
Sample bulk density (g/cm^3): 1.40

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content^T (% vol)
Relative humidity box:	20-Jun-05 / 14:20	70.47	851293	3.11

Comments:

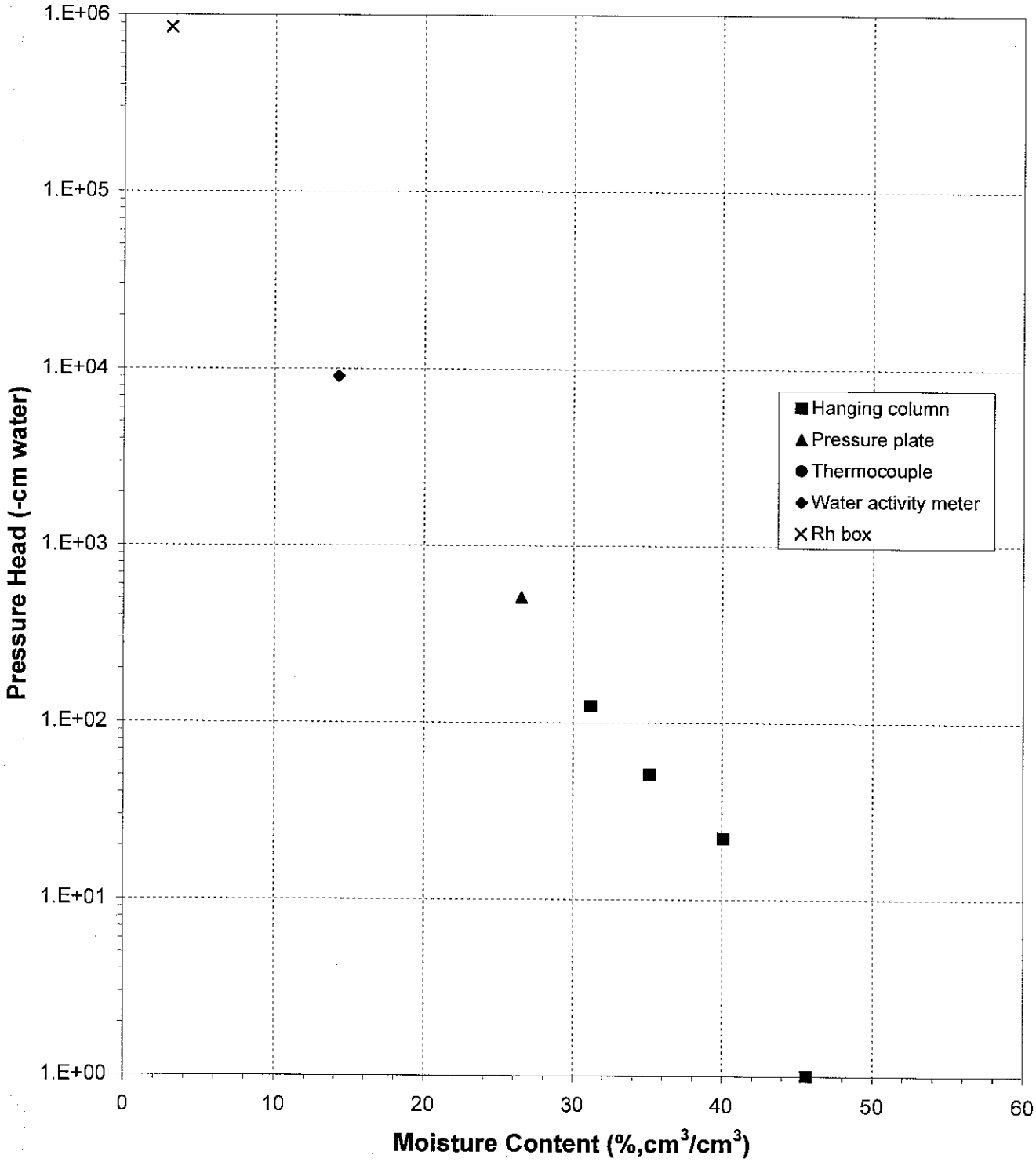
* Weight including tares

^{T} Assumed density of water is 1.0 g/cm^3

Laboratory analysis by: M. Devine/S. Shannon
Data entered by: D. O'Dowd
Checked by: J. Hines

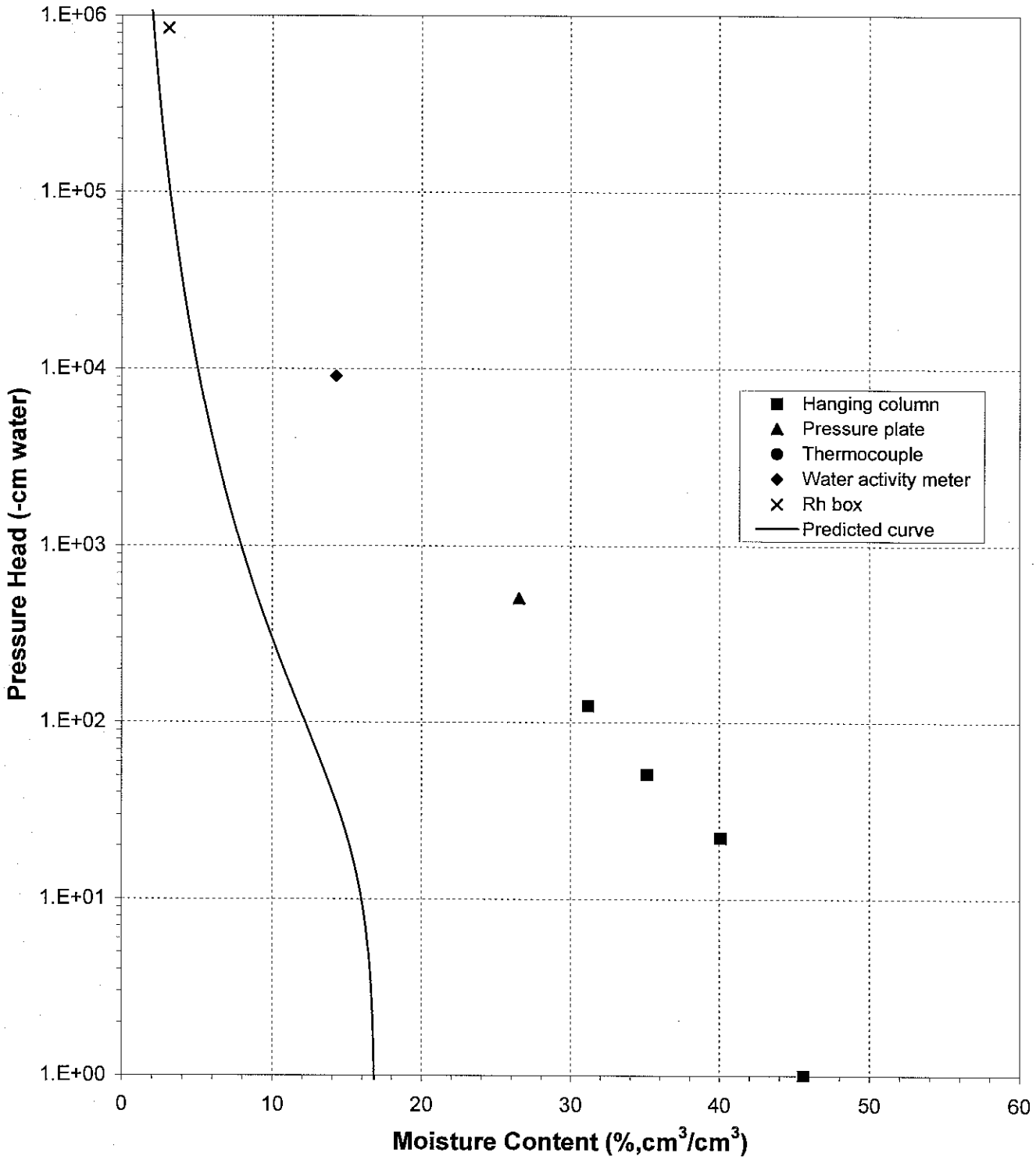
Water Retention Data Points

Sample Number: Test Plot 7A (0-2')(Gravel Corrected)



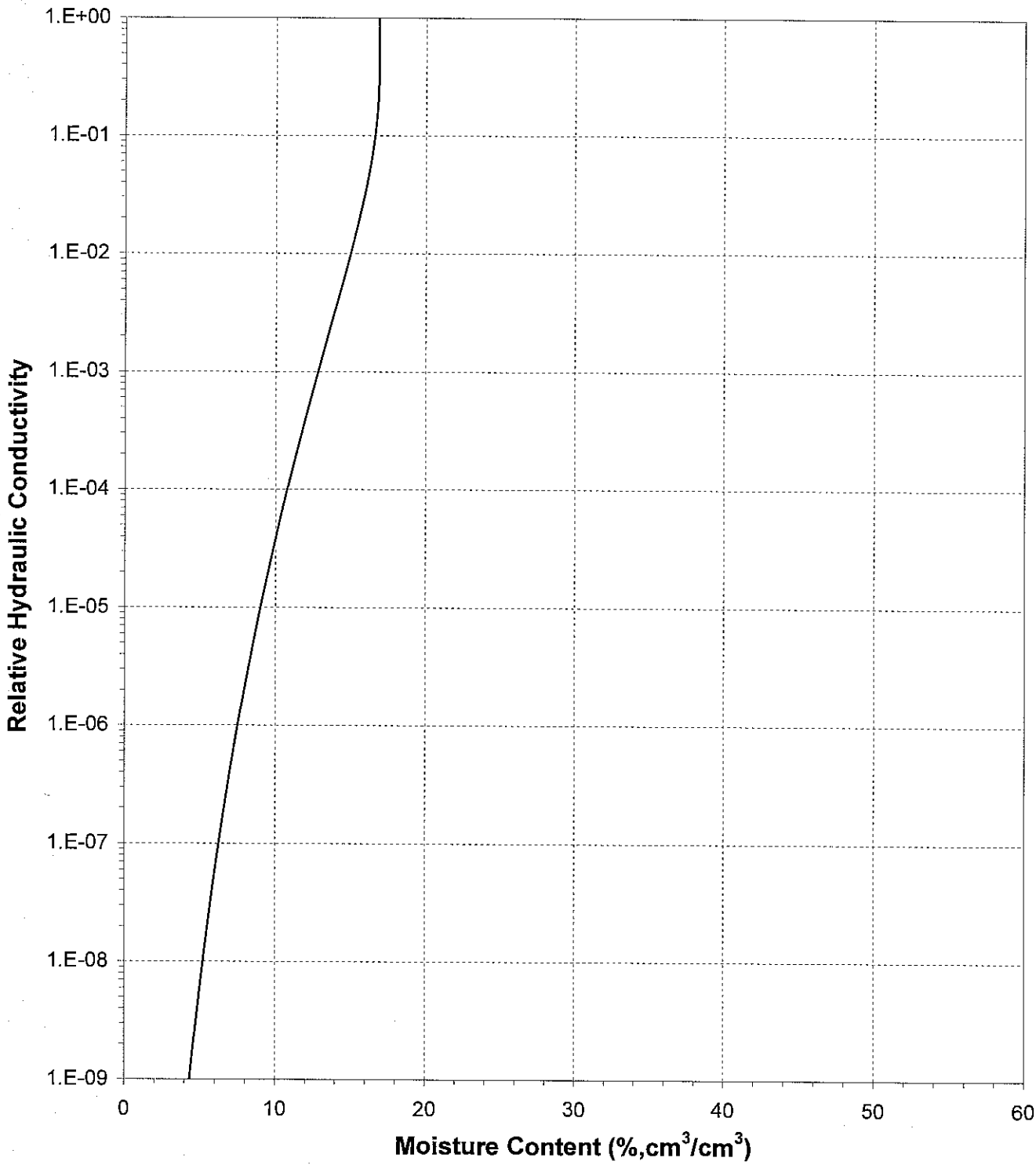
Predicted Water Retention Curve and Data Points

Sample Number: Test Plot 7A (0-2')(Gravel Corrected)



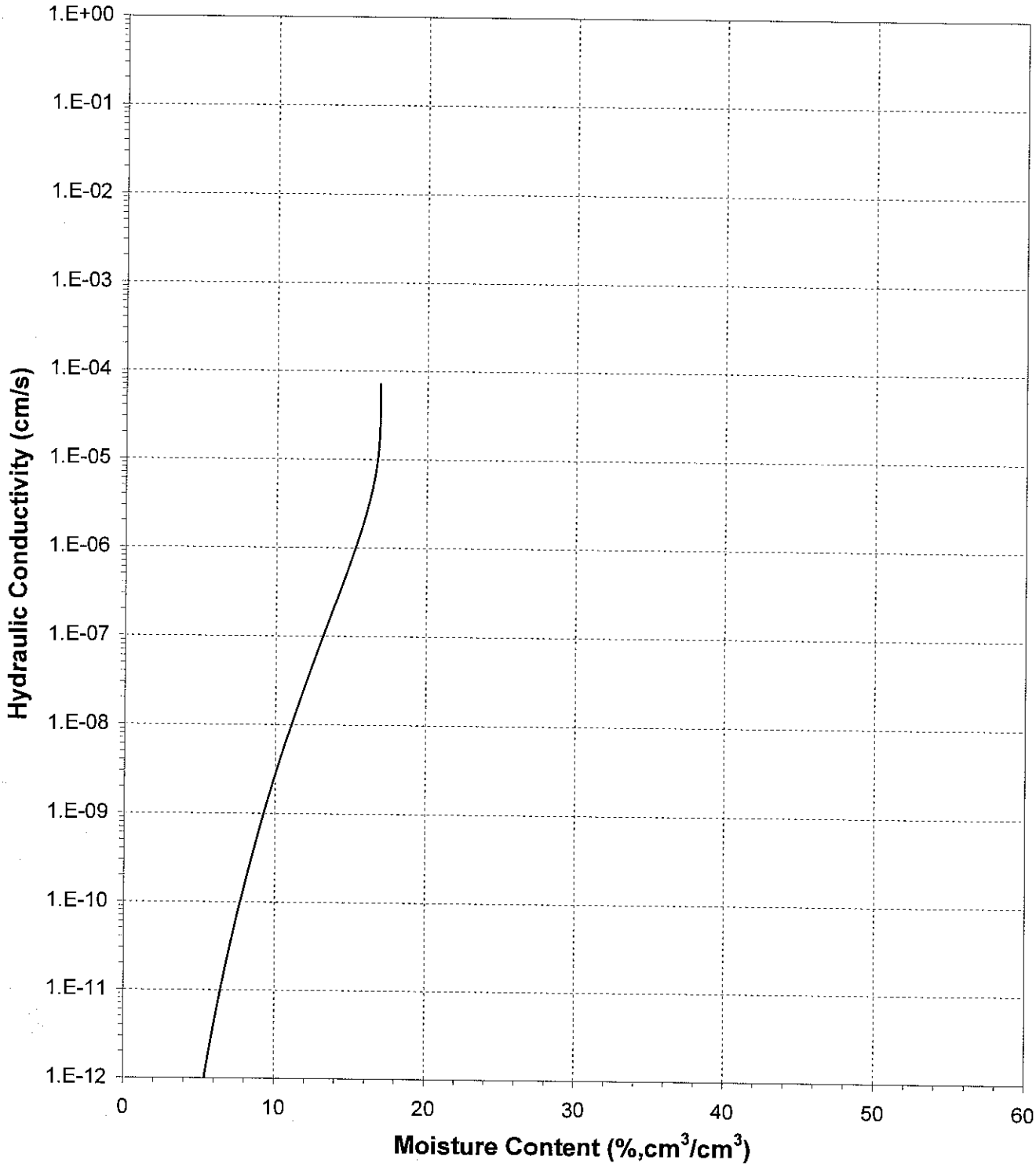
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: Test Plot 7A (0-2')(Gravel Corrected)



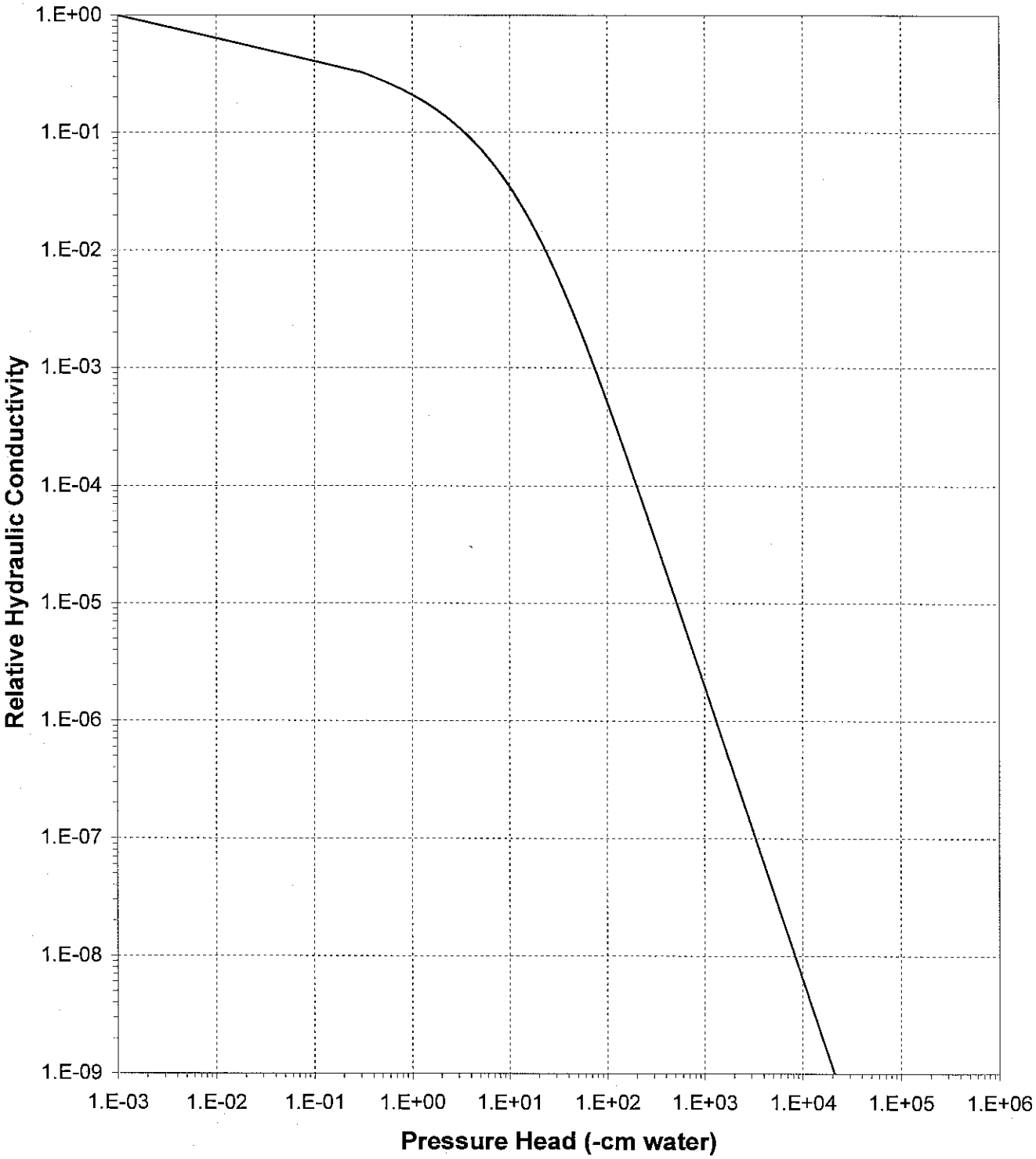
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: Test Plot 7A (0-2')(Gravel Corrected)



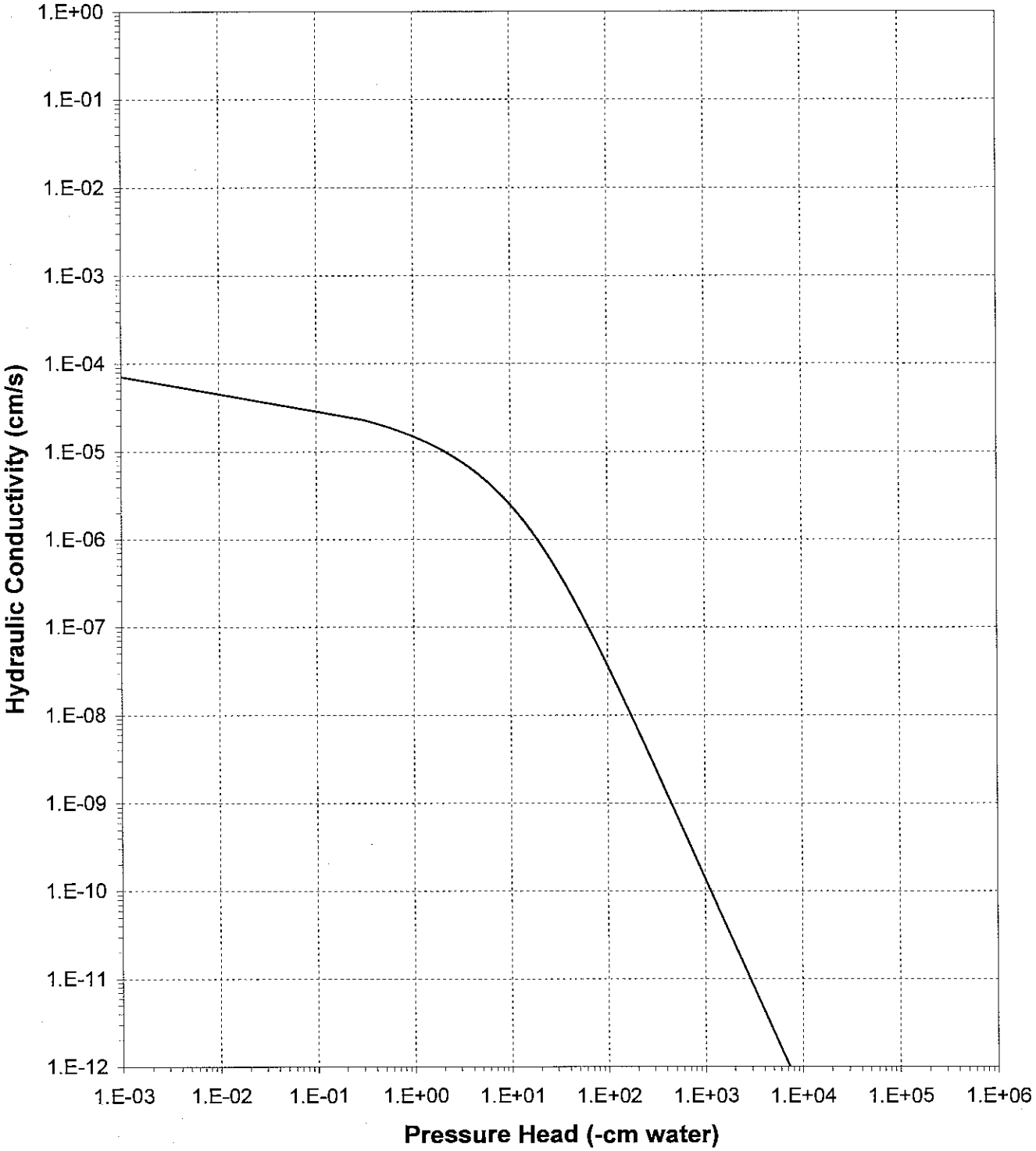
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: Test Plot 7A (0-2')(Gravel Corrected)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: Test Plot 7A (0-2')(Gravel Corrected)



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Gravel Correction Data Sheet

Job name: Golder
Job number: LB05.0119.00
Sample Name/Number: Test Plot 10A (6-7)
Split: #10

Uncorrected input values		Corrected Values	
Mass (coarse)(g):	8405		
Mass (fines)(g):	3282		
Dry bulk density (fines)(g/cm^3):	1.41	Density (composite)(g/cm^3):	2.12
**Density (coarse)(g/cm^3):	2.64		
Ksat value (fines)(cm/sec):	2.0E-04	Ksat composite(cm/sec):	8.4E-05
Theta initial (fines):	0.1590	Theta initial composite:	0.0672
Theta saturated (fines):	0.4288	Theta saturated composite:	0.1811
Theta residual (fines):	0.0000	Theta residual composite:	0.0000
*Theta initial (coarse):	0		
*Theta saturated (coarse):	0		
*Theta residual (coarse):	0		
*Volume (coarse voids)(cm^3):	0		

Volumetric fraction of fines in composite: 0.422
Volumetric fraction of coarse in composite: 0.578
Volumetric fraction of voids in composite: 0.000
Volume (fines)(cm^3): 2327.66
Volume (coarse)(cm^3): 3183.71
Volume (composite)(cm^3): 5511.37

*Comments: *Values will be zero if the coarse fraction is assumed to hold no water in pores. **Density based upon specific gravity tests which assumes the coarse and fine fractions are the same material.*

Date: 18-Jul-05
Data entered by: D. O'Dowd
Checked by: J. Hines

Moisture Retention Data

Hanging Column/Pressure Plate/Thermocouple

(Main Drainage Curve)

Job Name:	Golder	*Dry wt. of sample* (g):	198.51
Job Number:	LB05.0119.00	*Tare wt., screen & clamp* (g):	26.02
Sample Number:	Test Plot 10A (6-7')(Gravel Corrected)	*Tare wt., ring* (g):	117.48
Ring Number:	NA	*Tare wt., epoxy* (g):	0.00
Depth:	NA	*Sample volume* (cm^3):	140.90

Saturated weight at 0 cm tension* (g):	402.80
Volume of water[T] in saturated sample (cm^3):	60.79
Saturated moisture content (% vol):	43.14
Sample bulk density (g/cm^3):	1.41

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content[T] (% vol)
Hanging column:	10-Jun-05 / 09:25	402.80	0.00	43.14
	17-Jun-05 / 09:50	393.25	25.00	36.37
	23-Jun-05 / 09:50	387.07	52.00	31.98
	30-Jun-05 / 13:10	381.26	144.30	27.86
Pressure plate:	06-Jul-05 / 09:20	376.55	509.90	24.51

Comments:

* Weight including tares

[T] Assumed density of water is 1.0 g/cm^3

Laboratory analysis by: T. Bowekaty
Data entered by: M. Devine
Checked by: J. Hines

Moisture Retention Data

Water Activity Meter/Relative Humidity Box

(Main Drainage Curve)

Job Name: Golder
Job Number: LB05.0119.00
Sample Number: Test Plot 10A (6-7')(Gravel Corrected)
Ring Number: NA
Depth: NA

Dry weight of water activity meter sample* (g): 141.31
Tare weight, jar (g): 112.79
Sample bulk density (g/cm^3): 1.41

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content^T (% vol)
Water Activity Meter:	21-Jun-05 / 15:55	143.85	17030.7	12.55

Dry weight of relative humidity box sample* (g): 77.52
Tare weight (g): 41.62
Sample bulk density (g/cm^3): 1.41

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content^T (% vol)
Relative humidity box:	20-Jun-05 / 14:20	78.18	851293	2.61

Comments:

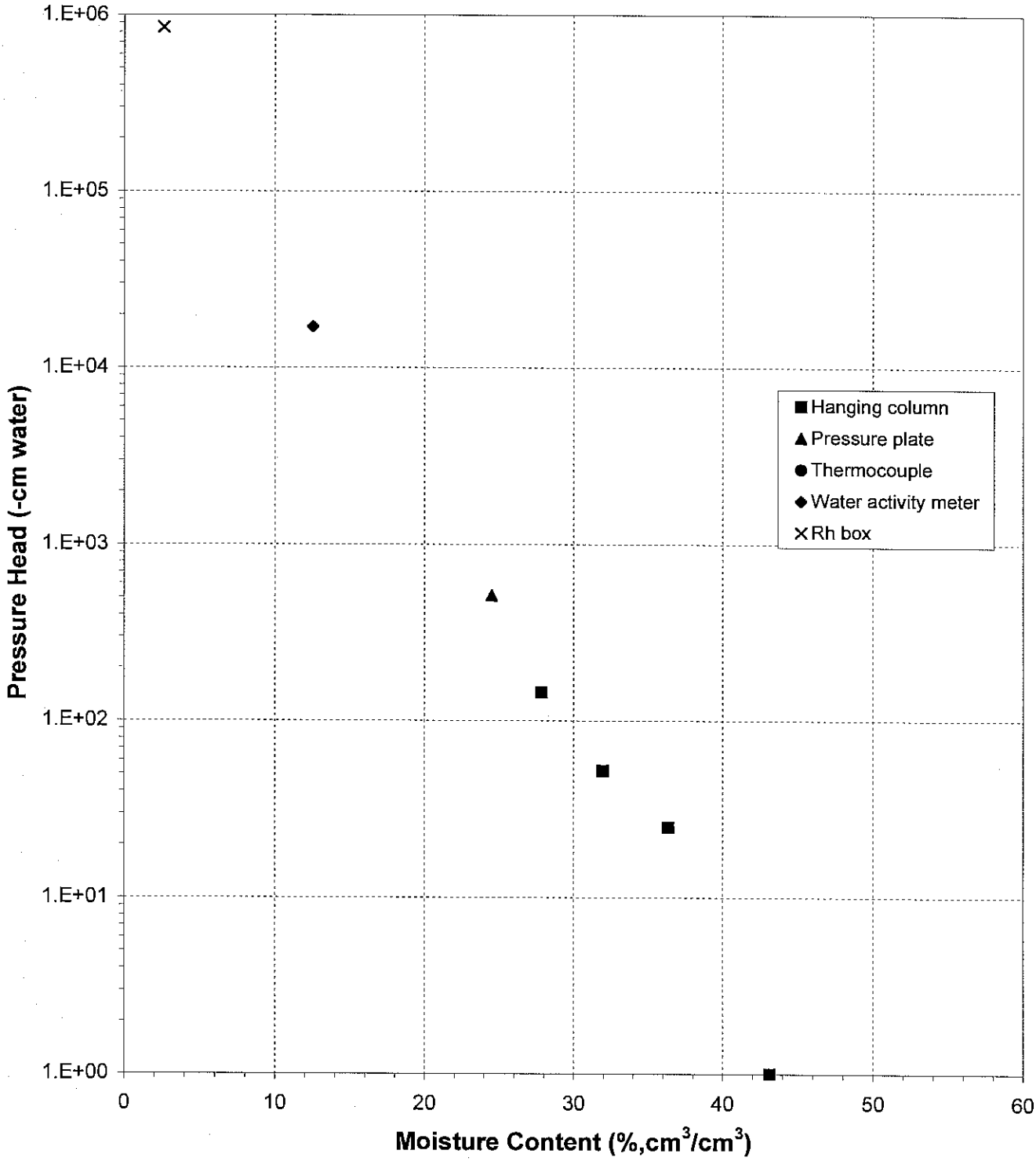
* Weight including tares

^{T} Assumed density of water is 1.0 g/cm^3

Laboratory analysis by: M. Carrillo/S. Shannon
Data entered by: M. Devine
Checked by: J. Hines

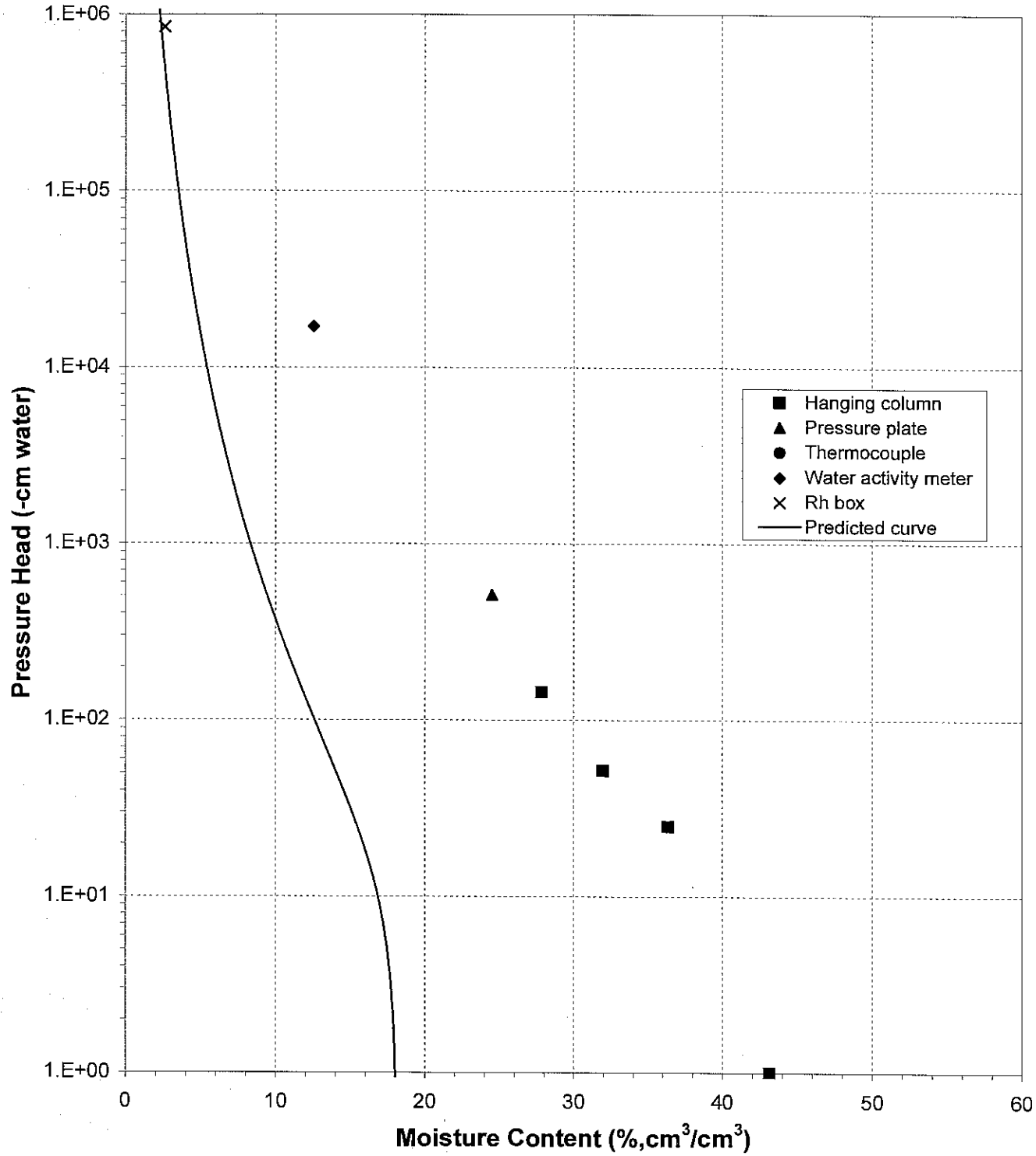
Water Retention Data Points

Sample Number: Test Plot 10A (6-7')(Gravel Corrected)



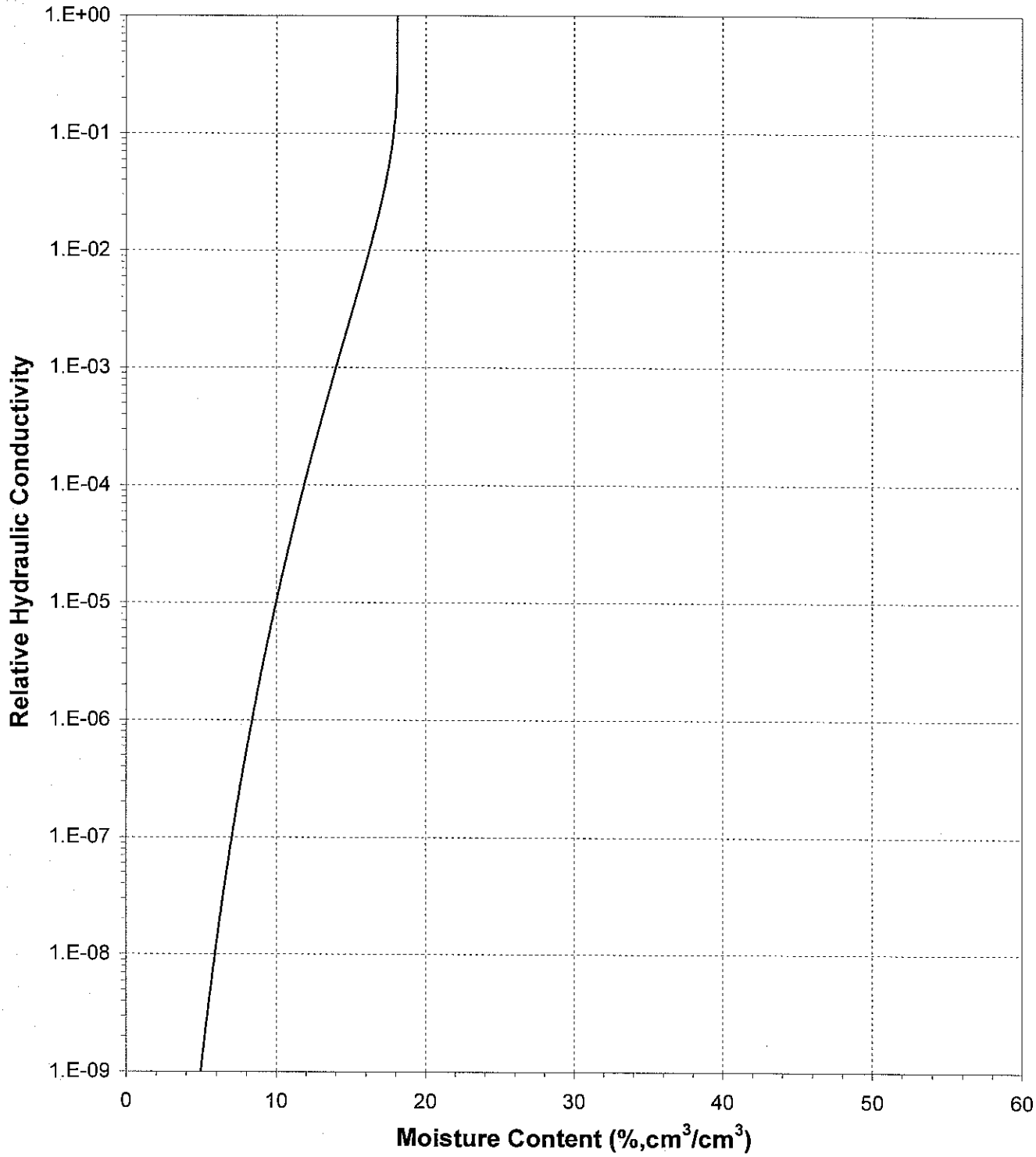
Predicted Water Retention Curve and Data Points

Sample Number: Test Plot 10A (6-7')(Gravel Corrected)



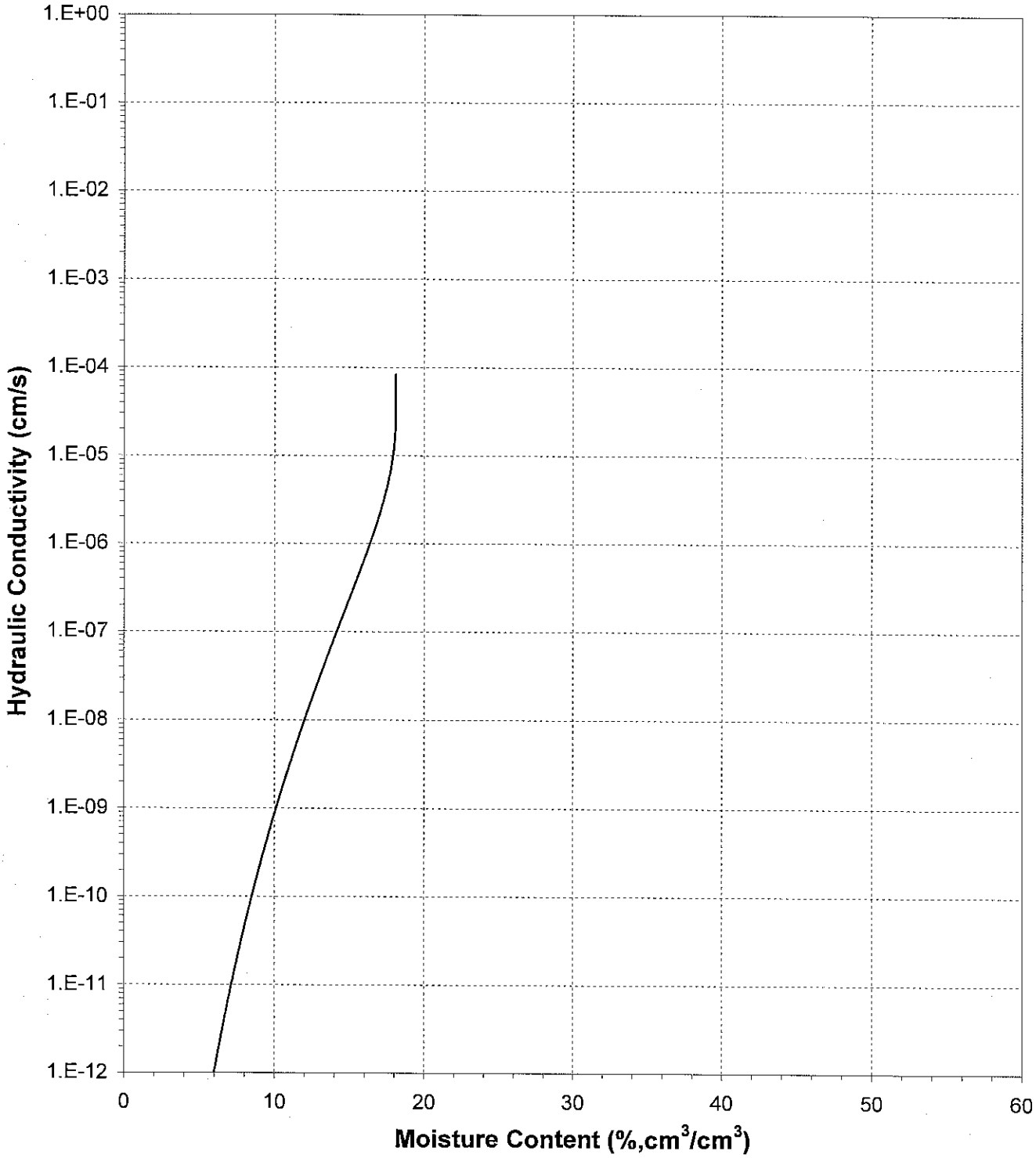
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: Test Plot 10A (6-7')(Gravel Corrected)



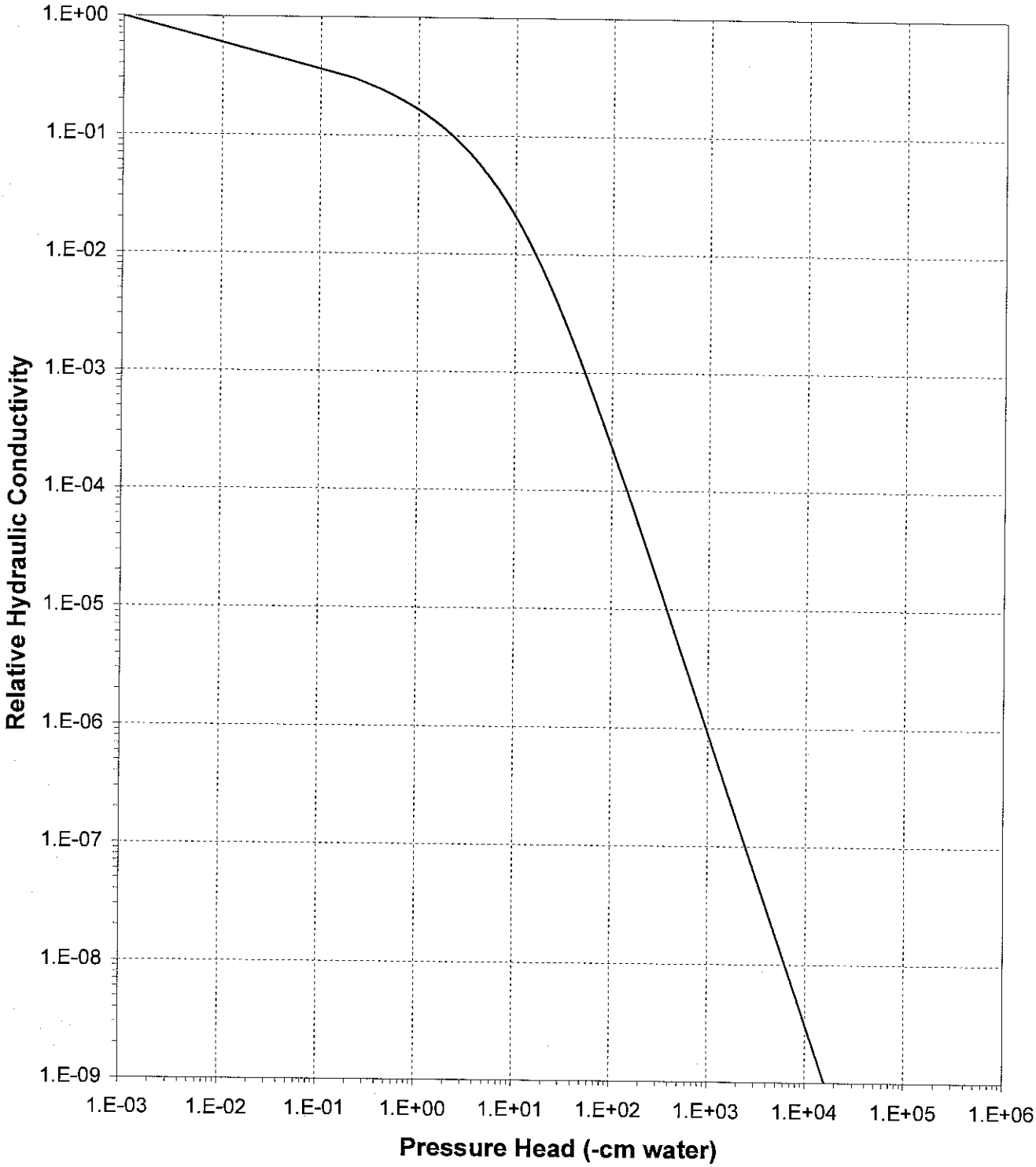
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: Test Plot 10A (6-7')(Gravel Corrected)



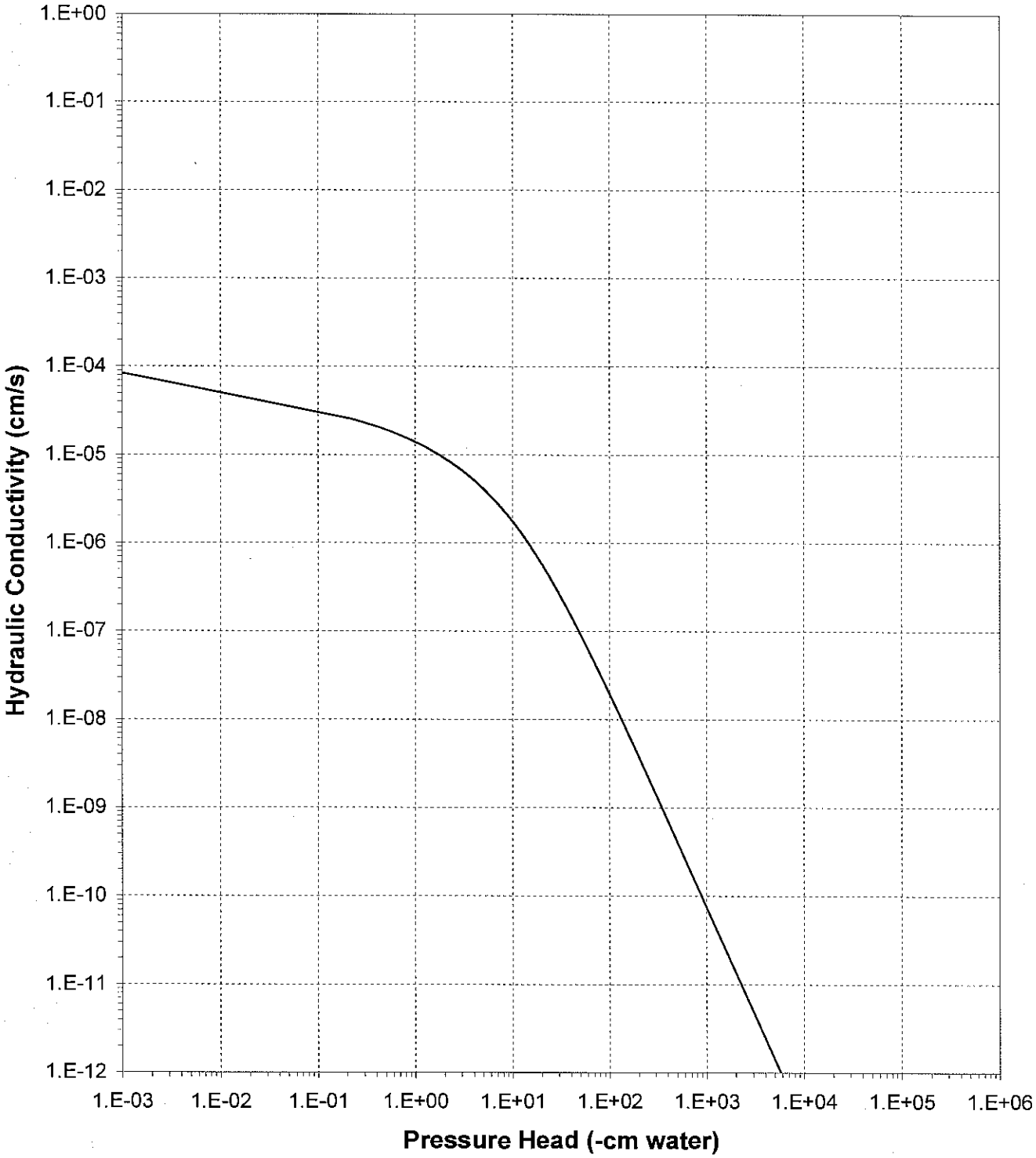
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: Test Plot 10A (6-7')(Gravel Corrected)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: Test Plot 10A (6-7')(Gravel Corrected)



Specific Gravity

Summary of Particle Density Tests

Sample Number	Particle Density (g/cm^3)
Test Plot 1B (0-2')	2.67
Test Plot 1B (2-3')	2.58
Test Plot 1B (4-5')	2.58
Test Plot 3C (0-2')	2.66
Test Plot 3C (2-3')	2.61
Test Plot 5A (3-4')	2.59
Test Plot 7A (0-2')	2.64
Test Plot 10A (6-7')	2.64

Particle Density

Job Name: Golder
Job Number: LB05.0119.00
Sample Number: Test Plot 1B (0-2')
Ring Number: NA
Depth: NA
Test Date: 2-Jun-05

Trial 1

Weight of pycnometer filled w/air (g):	102.02
Weight of pycnometer filled w/soil (g):	152.70
Weight of pycnometer filled w/soil & water (g):	383.01
Weight of pycnometer filled w/water (g):	351.28
Observed temperature (°C):	21.20
Density of water at observed temperature (g/cm^3):	0.9980
Particle Density (g/cm^3):	2.67
Correction factor, K:	0.9997
Particle Density at 20°C (g/cm^3):	2.67

Trial 2

Weight of pycnometer filled w/air (g):	91.48
Weight of pycnometer filled w/soil (g):	142.30
Weight of pycnometer filled w/soil & water (g):	372.44
Weight of pycnometer filled w/water (g):	340.64
Observed temperature (°C):	21.00
Density of water at observed temperature (g/cm^3):	0.9980
Particle Density (g/cm^3):	2.67
Correction factor, K:	0.9998
Particle Density at 20°C (g/cm^3):	2.67

Average Particle Density **(g/cm^3):** **2.67**

Comments:

Laboratory analysis by: M. Carrillo
Data entered by: M. Carrillo
Checked by: J. Hines

Particle Density

Job Name: Golder
Job Number: LB05.0119.00
Sample Number: Test Plot 1B (2-3')
Ring Number: NA
Depth: NA
Test Date: 2-Jun-05

Trial 1

Weight of pycnometer filled w/air (g):	91.75
Weight of pycnometer filled w/soil (g):	142.45
Weight of pycnometer filled w/soil & water (g):	372.05
Weight of pycnometer filled w/water (g):	340.93
Observed temperature (°C):	21.20
Density of water at observed temperature (g/cm^3):	0.9980
Particle Density (g/cm^3):	2.58
Correction factor, K:	0.9997
Particle Density at 20°C (g/cm^3):	2.59

Trial 2

Weight of pycnometer filled w/air (g):	100.59
Weight of pycnometer filled w/soil (g):	151.03
Weight of pycnometer filled w/soil & water (g):	380.74
Weight of pycnometer filled w/water (g):	349.79
Observed temperature (°C):	21.40
Density of water at observed temperature (g/cm^3):	0.9979
Particle Density (g/cm^3):	2.58
Correction factor, K:	0.9997
Particle Density at 20°C (g/cm^3):	2.58

Average Particle Density **(g/cm^3)*:*** **2.58**

Comments:

Laboratory analysis by: M. Carrillo
Data entered by: M. Carrillo
Checked by: J. Hines

Particle Density

Job Name: Golder
Job Number: LB05.0119.00
Sample Number: Test Plot 1B (4-5')
Ring Number: NA
Depth: NA
Test Date: 2-Jun-05

Trial 1

Weight of pycnometer filled w/air (g):	93.32
Weight of pycnometer filled w/soil (g):	143.69
Weight of pycnometer filled w/soil & water (g):	373.39
Weight of pycnometer filled w/water (g):	342.44
Observed temperature (°C):	21.30
Density of water at observed temperature (g/cm^3):	0.9979
Particle Density (g/cm^3):	2.59
Correction factor, K:	0.9997
Particle Density at 20°C (g/cm^3):	2.59

Trial 2

Weight of pycnometer filled w/air (g):	85.92
Weight of pycnometer filled w/soil (g):	136.44
Weight of pycnometer filled w/soil & water (g):	366.08
Weight of pycnometer filled w/water (g):	335.20
Observed temperature (°C):	21.00
Density of water at observed temperature (g/cm^3):	0.9980
Particle Density (g/cm^3):	2.57
Correction factor, K:	0.9998
Particle Density at 20°C (g/cm^3):	2.57

***Average Particle Density* (g/cm^3):** **2.58**

Comments:

Laboratory analysis by: M. Carrillo
Data entered by: M. Carrillo
Checked by: J. Hines

Particle Density

Job Name: Golder
Job Number: LB05.0119.00
Sample Number: Test Plot 3C (0-2')
Ring Number: NA
Depth: NA
Test Date: 2-Jun-05

Trial 1

Weight of pycnometer filled w/air (g):	99.26
Weight of pycnometer filled w/soil (g):	149.86
Weight of pycnometer filled w/soil & water (g):	380.10
Weight of pycnometer filled w/water (g):	348.53
Observed temperature (°C):	21.20
Density of water at observed temperature (g/cm^3):	0.9980
Particle Density (g/cm^3):	2.65
Correction factor, K:	0.9997
Particle Density at 20°C (g/cm^3):	2.65

Trial 2

Weight of pycnometer filled w/air (g):	99.30
Weight of pycnometer filled w/soil (g):	151.55
Weight of pycnometer filled w/soil & water (g):	381.14
Weight of pycnometer filled w/water (g):	348.46
Observed temperature (°C):	21.40
Density of water at observed temperature (g/cm^3):	0.9979
Particle Density (g/cm^3):	2.66
Correction factor, K:	0.9997
Particle Density at 20°C (g/cm^3):	2.66

***Average Particle Density* (g/cm^3):** **2.66**

Comments:

Laboratory analysis by: M. Carrillo
Data entered by: M. Carrillo
Checked by: J. Hines

Particle Density

Job Name: Golder
Job Number: LB05.0119.00
Sample Number: Test Plot 3C (2-3')
Ring Number: NA
Depth: NA
Test Date: 2-Jun-05

Trial 1

Weight of pycnometer filled w/air (g):	90.97
Weight of pycnometer filled w/soil (g):	141.67
Weight of pycnometer filled w/soil & water (g):	371.51
Weight of pycnometer filled w/water (g):	340.31
Observed temperature (°C):	20.30
Density of water at observed temperature (g/cm^3):	0.9981
Particle Density (g/cm^3):	2.60
Correction factor, K:	0.9999
Particle Density at 20°C (g/cm^3):	2.60

Trial 2

Weight of pycnometer filled w/air (g):	91.23
Weight of pycnometer filled w/soil (g):	143.14
Weight of pycnometer filled w/soil & water (g):	372.46
Weight of pycnometer filled w/water (g):	340.34
Observed temperature (°C):	20.50
Density of water at observed temperature (g/cm^3):	0.9981
Particle Density (g/cm^3):	2.62
Correction factor, K:	0.9999
Particle Density at 20°C (g/cm^3):	2.62

***Average Particle Density* (g/cm^3):** **2.61**

Comments:

Laboratory analysis by: M. Carrillo
Data entered by: M. Carrillo
Checked by: J. Hines

Particle Density

Job Name: Golder
Job Number: LB05.0119.00
Sample Number: Test Plot 5A (3-4')
Ring Number: NA
Depth: NA
Test Date: 2-Jun-05

Trial 1

Weight of pycnometer filled w/air (g):	90.94
Weight of pycnometer filled w/soil (g):	141.42
Weight of pycnometer filled w/soil & water (g):	371.13
Weight of pycnometer filled w/water (g):	340.14
Observed temperature (°C):	21.50
Density of water at observed temperature (g/cm^3):	0.9979
Particle Density (g/cm^3):	2.58
Correction factor, K:	0.9997
Particle Density at 20°C (g/cm^3):	2.58

Trial 2

Weight of pycnometer filled w/air (g):	91.51
Weight of pycnometer filled w/soil (g):	141.85
Weight of pycnometer filled w/soil & water (g):	371.61
Weight of pycnometer filled w/water (g):	340.64
Observed temperature (°C):	21.40
Density of water at observed temperature (g/cm^3):	0.9979
Particle Density (g/cm^3):	2.59
Correction factor, K:	0.9997
Particle Density at 20°C (g/cm^3):	2.59

***Average Particle Density* (g/cm^3):** **2.59**

Comments:

Laboratory analysis by: M. Carrillo
Data entered by: M. Carrillo
Checked by: J. Hines

Particle Density

Job Name: Golder
Job Number: LB05.0119.00
Sample Number: Test Plot 7A (0-2')
Ring Number: NA
Depth: NA
Test Date: 2-Jun-05

Trial 1

Weight of pycnometer filled w/air (g):	100.37
Weight of pycnometer filled w/soil (g):	150.65
Weight of pycnometer filled w/soil & water (g):	380.95
Weight of pycnometer filled w/water (g):	349.62
Observed temperature (°C):	21.50
Density of water at observed temperature (g/cm^3):	0.9979
Particle Density (g/cm^3):	2.65
Correction factor, K:	0.9997
Particle Density at 20°C (g/cm^3):	2.65

Trial 2

Weight of pycnometer filled w/air (g):	91.07
Weight of pycnometer filled w/soil (g):	142.14
Weight of pycnometer filled w/soil & water (g):	371.96
Weight of pycnometer filled w/water (g):	340.29
Observed temperature (°C):	21.20
Density of water at observed temperature (g/cm^3):	0.9980
Particle Density (g/cm^3):	2.63
Correction factor, K:	0.9997
Particle Density at 20°C (g/cm^3):	2.63

***Average Particle Density* (g/cm^3):** **2.64**

Comments:

Laboratory analysis by: M. Carrillo
Data entered by: M. Carrillo
Checked by: J. Hines

Particle Density

Job Name: Golder
Job Number: LB05.0119.00
Sample Number: Test Plot 10A (6-7')
Ring Number: NA
Depth: NA
Test Date: 2-Jun-05

Trial 1

Weight of pycnometer filled w/air (g):	85.79
Weight of pycnometer filled w/soil (g):	136.13
Weight of pycnometer filled w/soil & water (g):	366.27
Weight of pycnometer filled w/water (g):	335.07
Observed temperature (°C):	20.40
Density of water at observed temperature (g/cm^3):	0.9981
Particle Density (g/cm^3):	2.63
Correction factor, K:	0.9999
Particle Density at 20°C (g/cm^3):	2.63

Trial 2

Weight of pycnometer filled w/air (g):	90.81
Weight of pycnometer filled w/soil (g):	141.03
Weight of pycnometer filled w/soil & water (g):	371.27
Weight of pycnometer filled w/water (g):	339.94
Observed temperature (°C):	20.80
Density of water at observed temperature (g/cm^3):	0.9980
Particle Density (g/cm^3):	2.65
Correction factor, K:	0.9998
Particle Density at 20°C (g/cm^3):	2.65

***Average Particle Density* (g/cm^3):** **2.64**

Comments:

Laboratory analysis by: M. Carrillo
Data entered by: M. Carrillo
Checked by: J. Hines

Percent Sand, Silt & Clay

Summary of Percent Sand, Silt & Clay Tests

Sample Number	% Sand	% Silt	% Clay
Test Plot 1B (0-2')	56.2	25.4	18.4
Test Plot 1B (2-3')	57.2	24.4	18.4
Test Plot 1B (4-5')	58.0	24.0	18.0
Test Plot 3C (0-2')	60.0	22.7	17.3
Test Plot 3C (2-3')	60.3	22.8	16.9
Test Plot 5A (3-4')	55.5	25.7	18.8
Test Plot 7A (0-2')	56.6	24.9	18.4
Test Plot 10A (6-7')	58.7	23.4	17.9

Particle Size Analysis
Hydrometer Data

Job Name: Golder (5-05)
Job Number: LB05.0119.00
Sample Number: Test Plot 1B (0-2')
Ring Number: NA
Depth: NA

Test Date: 6-Jun-05
Start Time: 8:31

Type of Water Used: DISTILLED
Alkaline Buffer: Na_2CO_3
Dispersant:* $(NaPO_3)_6$
Assumed particle density: 2.65

Initial Wt. (g): 100.53

Date	Time	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)
17-Jun-05	8:31:40	23.7	50.0	6.0	44.0
	16:31:00	18.9	25.5	7.0	18.5

% Clay 18.4
% Silt 25.4
% Sand 56.2

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Particle Size Analysis
Hydrometer Data

Job Name: Golder (5-05)
Job Number: LB05.0119.00
Sample Number: Test Plot 1B (2-3')
Ring Number: NA
Depth: NA

Test Date: 6-Jun-05
Start Time: 8:10

Type of Water Used: DISTILLED
Alkaline Buffer: Na_2CO_3
Dispersant:* $(NaPO_3)_6$
Assumed particle density: 2.65

Initial Wt. (g): 100.51

Date	Time	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)
17-Jun-05	8:10:40	23.7	49.0	6.0	43.0
	16:10:00	18.9	25.5	7.0	18.5

% Clay 18.4
% Silt 24.4
% Sand 57.2

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Particle Size Analysis
Hydrometer Data

Job Name: Golder (5-05)
Job Number: LB05.0119.00
Sample Number: Test Plot 1B (4-5')
Ring Number: NA
Depth: NA

Test Date: 6-Jun-05
Start Time: 8:28

Type of Water Used: DISTILLED
Alkaline Buffer: Na_2CO_3
Dispersant:* $(NaPO_3)_6$
Assumed particle density: 2.65

Initial Wt. (g): 100.02

Date	Time	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)
17-Jun-05	8:28:40	23.7	48.0	6.0	42.0
	16:28:00	18.9	25.0	7.0	18.0

% Clay 18.0
% Silt 24.0
% Sand 58.0

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Golder (5-05)
Job Number: LB05.0119.00
Sample Number: Test Plot 3C (0-2')
Ring Number: NA
Depth: NA

Test Date: 6-Jun-05
Start Time: 8:25

Type of Water Used: DISTILLED
Alkaline Buffer: Na_2CO_3
Dispersant:* $(NaPO_3)_6$
Assumed particle density: 2.65

Initial Wt. (g): 101.37

Date	Time	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)
17-Jun-05	8:25:40	23.7	46.5	6.0	40.5
	16:25:00	18.9	24.5	7.0	17.5

% Clay 17.3
% Silt 22.7
% Sand 60.0

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Particle Size Analysis
Hydrometer Data

Job Name: Golder (5-05)
Job Number: LB05.0119.00
Sample Number: Test Plot 3C (2-3')
Ring Number: NA
Depth: NA

Test Date: 6-Jun-05
Start Time: 8:22

Type of Water Used: DISTILLED
Alkaline Buffer: Na_2CO_3
Dispersant:* $(NaPO_3)_6$
Assumed particle density: 2.65

Initial Wt. (g): 100.68

Date	Time	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)
17-Jun-05	8:22:40	23.7	46.0	6.0	40.0
	16:22:00	18.9	24.0	7.0	17.0

% Clay 16.9
% Silt 22.8
% Sand 60.3

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Particle Size Analysis
Hydrometer Data

Job Name: Golder (5-05)
Job Number: LB05.0119.00
Sample Number: Test Plot 5A (3-4')
Ring Number: NA
Depth: NA

Test Date: 6-Jun-05
Start Time: 8:16

Type of Water Used: DISTILLED
Alkaline Buffer: Na_2CO_3
Dispersant:* $(NaPO_3)_6$
Assumed particle density: 2.65
Initial Wt. (g): 101.07

Date	Time	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)
17-Jun-05	8:16:40	23.7	51.0	6.0	45.0
	16:16:00	18.9	26.0	7.0	19.0

% Clay 18.8
% Silt 25.7
% Sand 55.5

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Golder (5-05)
Job Number: LB05.0119.00
Sample Number: Test Plot 7A (0-2')
Ring Number: NA
Depth: NA

Test Date: 6-Jun-05
Start Time: 8:13

Type of Water Used: DISTILLED
Alkaline Buffer: Na_2CO_3
Dispersant:* $(NaPO_3)_6$
Assumed particle density: 2.65
Initial Wt. (g): 100.30

Date	Time	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)
17-Jun-05	8:13:40	23.7	49.5	6.0	43.5
	16:13:00	18.9	25.5	7.0	18.5

% Clay 18.4
% Silt 24.9
% Sand 56.6

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Particle Size Analysis
Hydrometer Data

Job Name: Golder (5-05)
Job Number: LB05.0119.00
Sample Number: Test Plot 10A (6-7')
Ring Number: NA
Depth: NA

Test Date: 6-Jun-05
Start Time: 8:19

Type of Water Used: DISTILLED
Alkaline Buffer: Na_2CO_3
Dispersant:* $(NaPO_3)_6$
Assumed particle density: 2.65

Initial Wt. (g): 100.43

Date	Time	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)
17-Jun-05	8:19:40	23.7	47.5	6.0	41.5
	16:19:00	18.9	25.0	7.0	18.0

% Clay 17.9
% Silt 23.4
% Sand 58.7

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Laboratory Tests and Methods

Tests and Methods

Dry Bulk Density:	ASTM D4531; ASTM D6836
Moisture Content:	ASTM D2216; ASTM D6836
Calculated Porosity:	Klute, A. 1986. Porosity. Chp.18-2.1, pp. 444-445, in A. Klute (ed.), Methods of Soil Analysis, American Society of Agronomy, Madison, WI
Saturated K: Constant Head:	ASTM D 2434 (modified apparatus)
Hanging Column Method:	ASTM D6836; Klute, A. 1986. Porosity. Chp.26, in A. Klute (ed.), Methods of Soil Analysis, American Society of Agronomy, Madison, WI
Pressure Plate Method:	ASTM D6836; ASTM D2325
Water Potential Method:	ASTM D6836; Rawlins, S.L. and G.S. Campbell, 1986. Water Potential: Thermocouple Psychrometry. Chp. 24, pp. 597-619, in A. Klute (ed.), Methods of Soil Analysis, Part 1. American Society of Agronomy, Madison, WI.
Relative Humidity Box:	Karathanasis & Hajek. 1982. Quantitative Evaluation of Water Adsorption on Soil Clays.SSA Journal 46:1321-1325
Calc. Kunsat:	ASTM D6836; Soil Sci. Soc. Am. J. 1980 44:892-898
Particle Density	ASTM D854
Percent Sand, Silt, Clay:	Bureau of Reclamation, Series 510, Part 514 (modified per L. Munk)

APPENDIX E

HDS CALIBRATION DATA

Celebrating
20 Years

September 29, 2005

Todd Stein
Golder Associates, Inc.
4910 Alameda Boulevard, Suite
Albuquerque, NM 87113

Re: Transmittal of Heat Disspation Sensor Calibration Results

Dear Mr. Stein:

Enclosed are the results of calibrations performed for 221 heat dissipation sensors in the DBS&A soils laboratory.

We appreciate the opportunity to provide these services, and look forward to working with Golder in the future.

If you have any questions regarding the calibrations, please feel free to contact me at (505) 822-9400.

Sincerely,

DANIEL B. STEPHENS & ASSOCIATES, INC.

John Kay
Hydrologist

Daniel B. Stephens & Associates, Inc.
6020 Academy NE, Suite 100 505-822-9400
Albuquerque, NM 87109 FAX 505-822-8877

Calibration Coefficients

Sensor SN:	Alpha	N	deltaT(dry)	deltaT(wet)
10195	0.0036	1.5746	2.795	0.685
10202	0.0043	1.5358	2.795	0.725
10208	0.0033	1.6600	2.709	0.757
10207	0.0036	1.5841	2.644	0.766
10210	0.0034	1.6561	2.677	0.692
10209	0.0078	1.4681	2.794	0.717
10204	0.0042	1.5762	2.875	0.692
10205	0.0037	1.5948	2.745	0.709
10203	0.0036	1.6146	2.932	0.692
10206	0.0034	1.5790	2.504	0.733
10305	0.0039	1.5578	2.58	0.708
10306	0.0039	1.5609	2.726	0.684
10308	0.0036	1.5674	2.755	0.725
10307	0.0040	1.5388	2.789	0.717
10340	0.0037	1.5245	2.588	0.7
10341	0.0032	1.6234	2.761	0.692

Golder

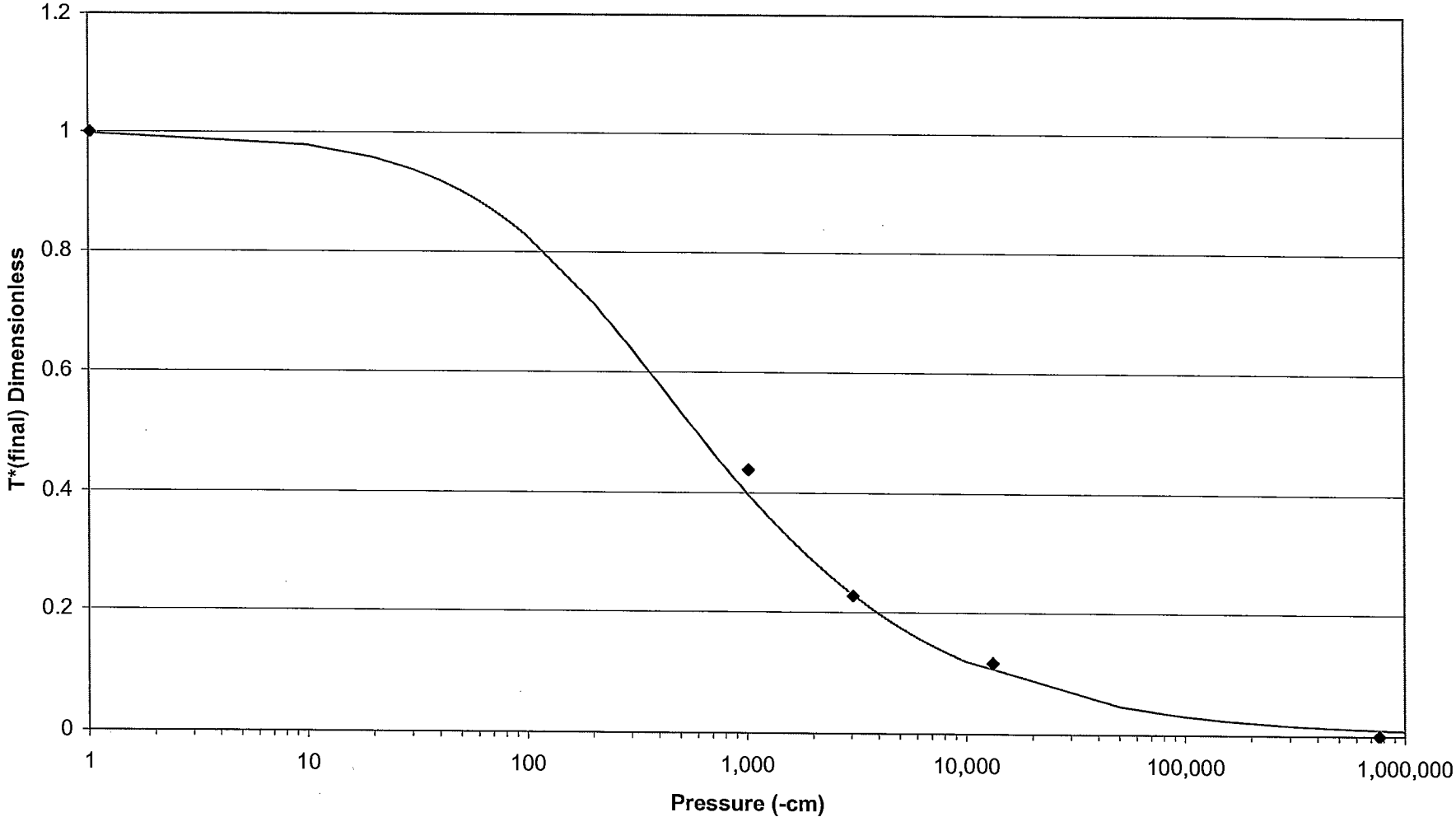
Batch 4.1

Calibration Data Points

	T* by Probe Serial Number															
Pressure (cm)	**10195**	**10202**	**10208**	**10207**	**10210**	**10209**	**10204**	**10205**	**10203**	**10206**	**9646**	**10306**	**10308**	**10307**	**10340**	**10341**
764,850	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1,020	0.439	0.394	0.423	0.385	0.444	0.439	0.411	0.376	0.466	0.433	0.420	0.431	0.442	0.470	0.452	0.475
3,059	0.227	0.194	0.220	0.219	0.239	0.222	0.209	0.157	0.274	0.257	0.231	0.247	0.277	0.258	0.255	0.238
13,257	0.117	0.056	0.097	0.130	0.121	0.125	0.099	0.060	0.113	0.139	0.107	0.123	0.171	0.111	0.108	0.115

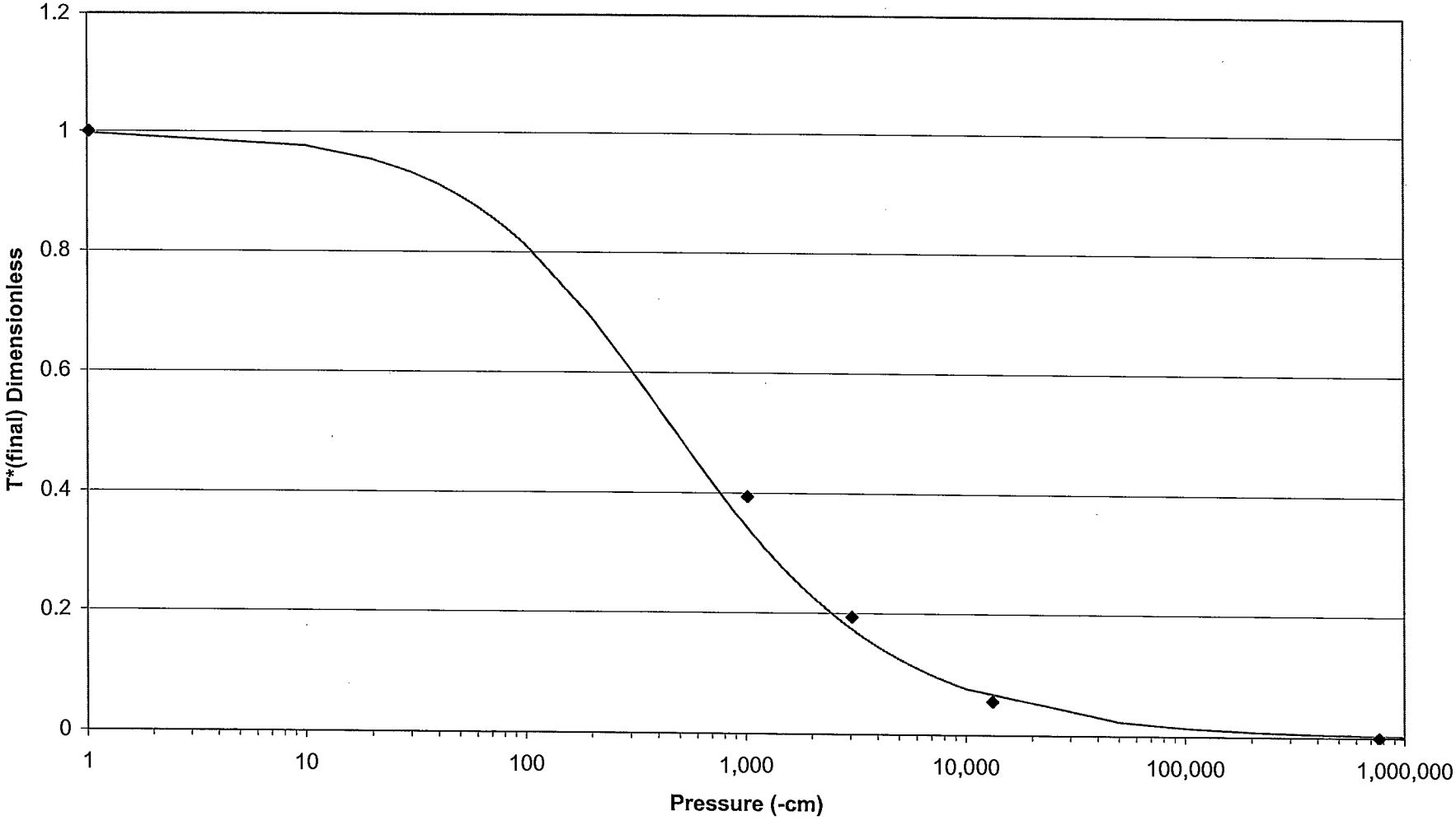
T*(final) vs Pressure

Campbell Scientific 229 Heat Dissipation Sensor SN: 10195



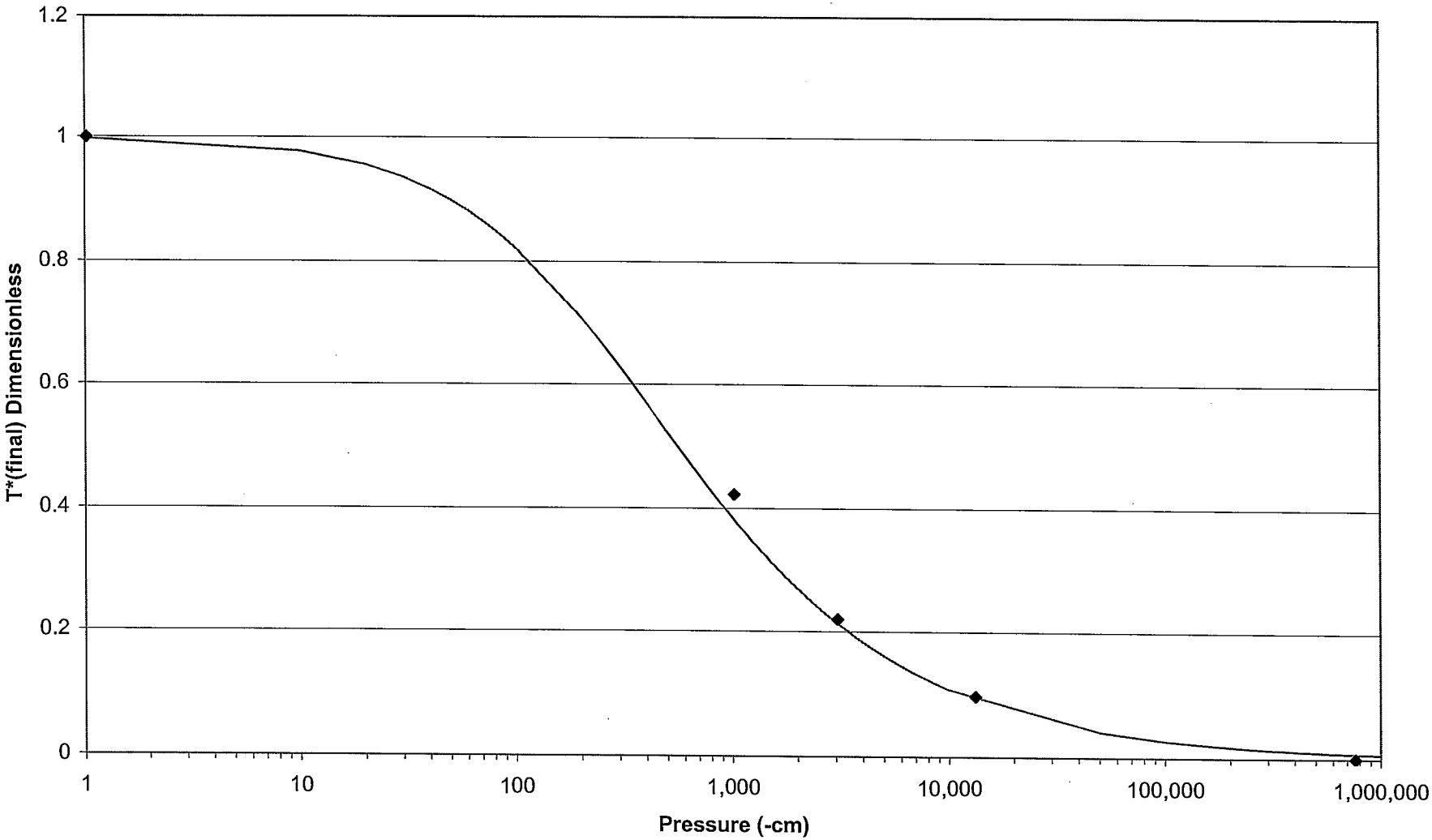
T*(final) vs Pressure

Campbell Scientific 229 Heat Dissipation Sensor SN: 10202



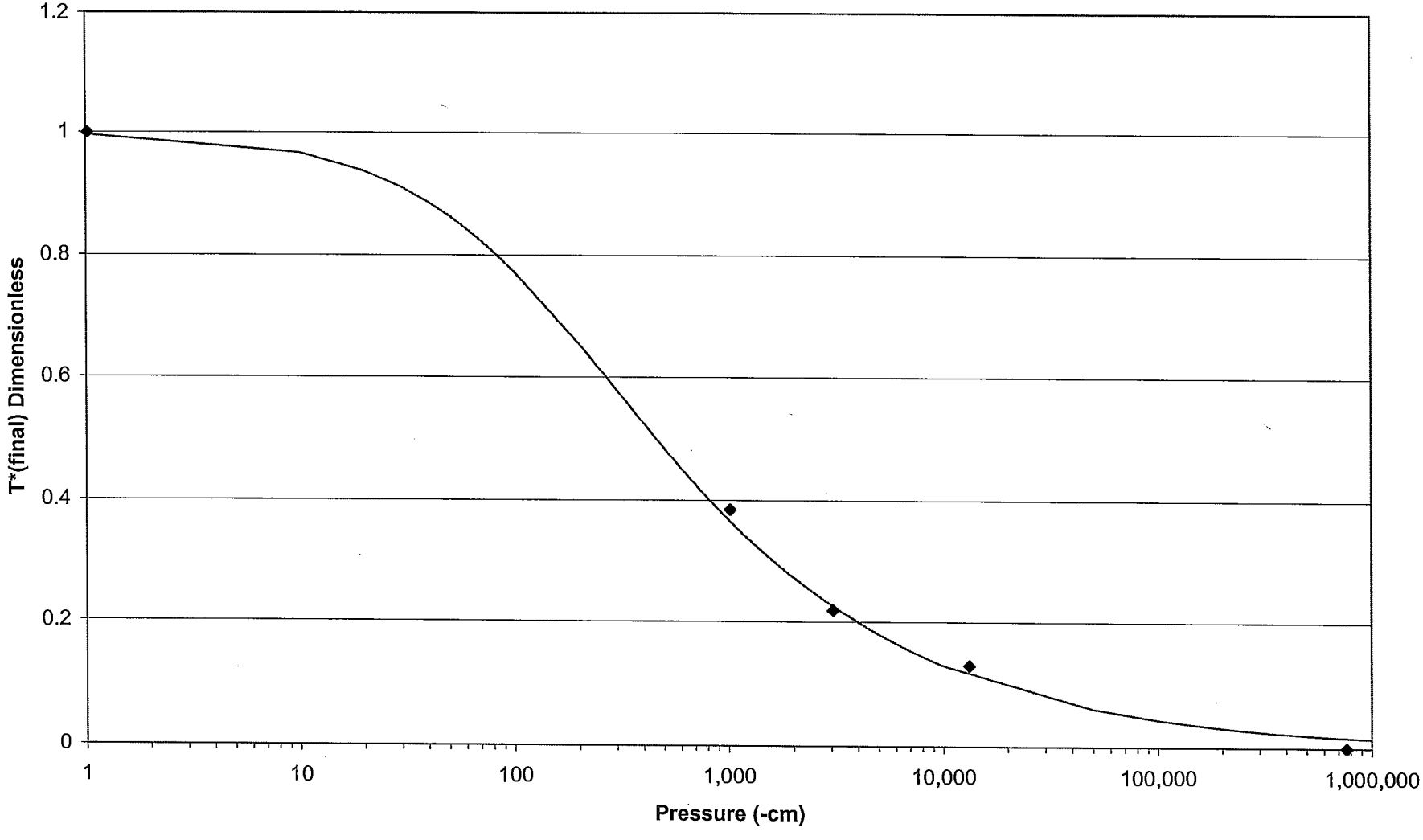
T*(final) vs Pressure

Campbell Scientific 229 Heat Dissipation Sensor SN: 20208



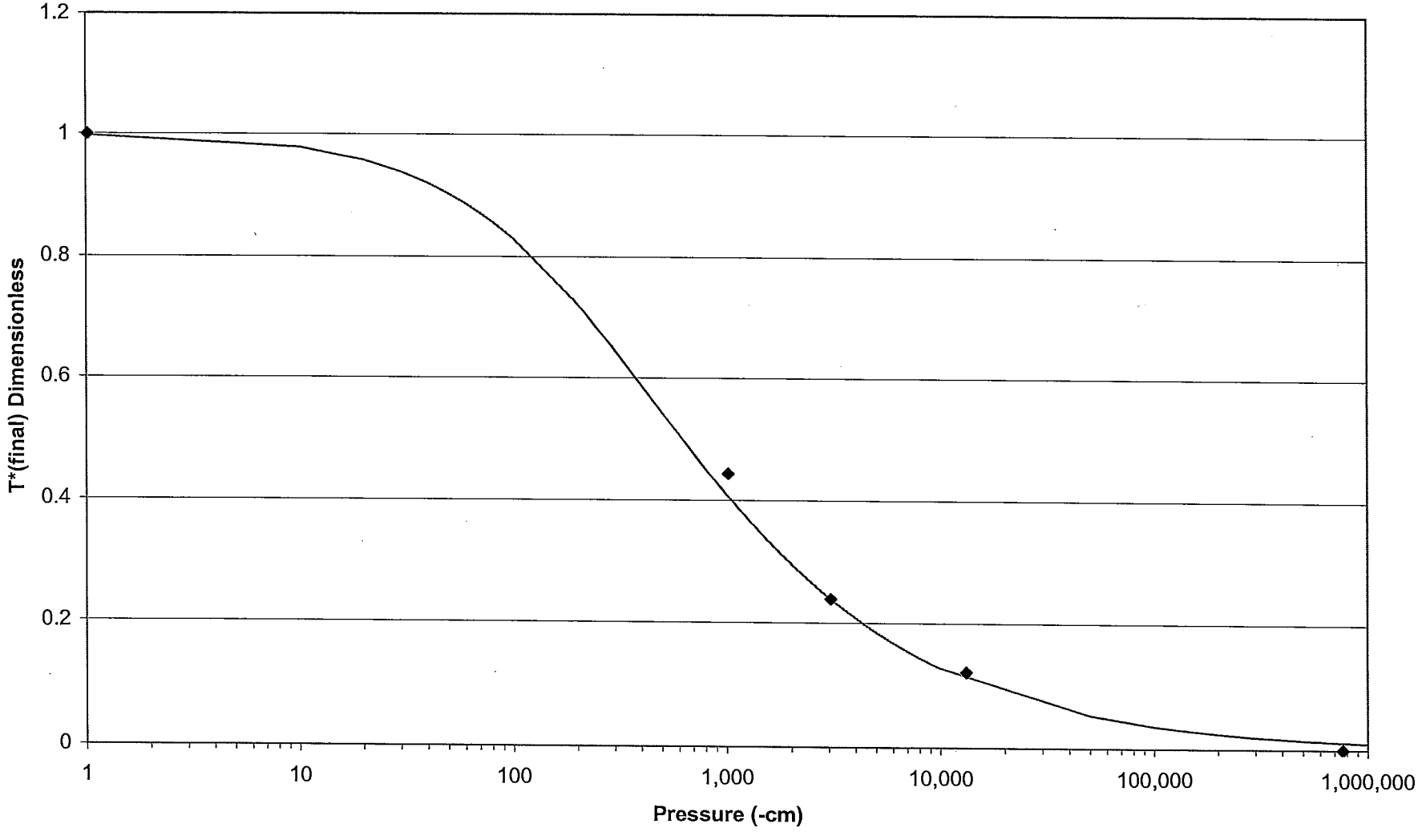
T*(final) vs Pressure

Campbell Scientific 229 Heat Dissipation Sensor SN: 10207



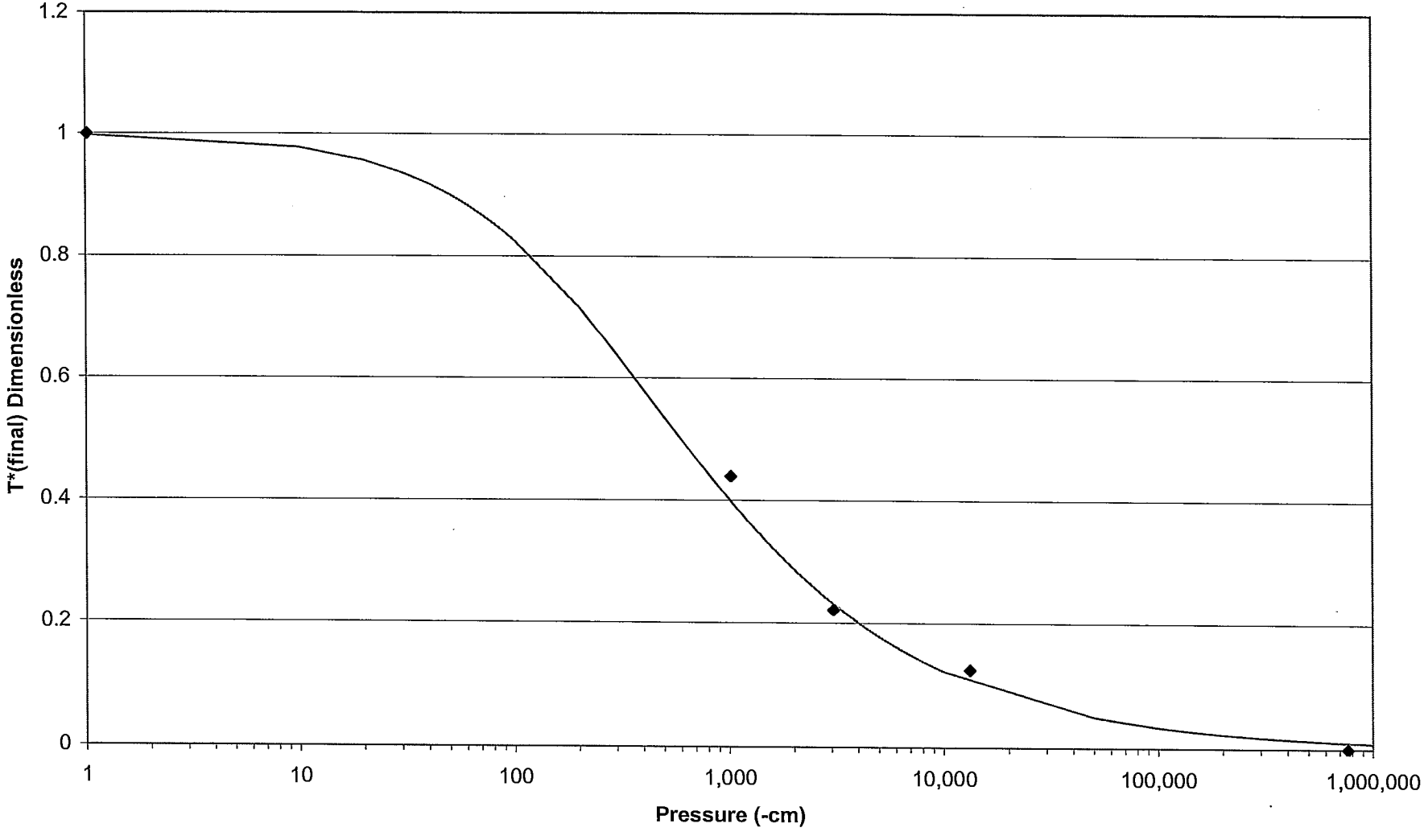
T*(final) vs Pressure

Campbell Scientific 229 Heat Dissipation Sensor SN: 10205



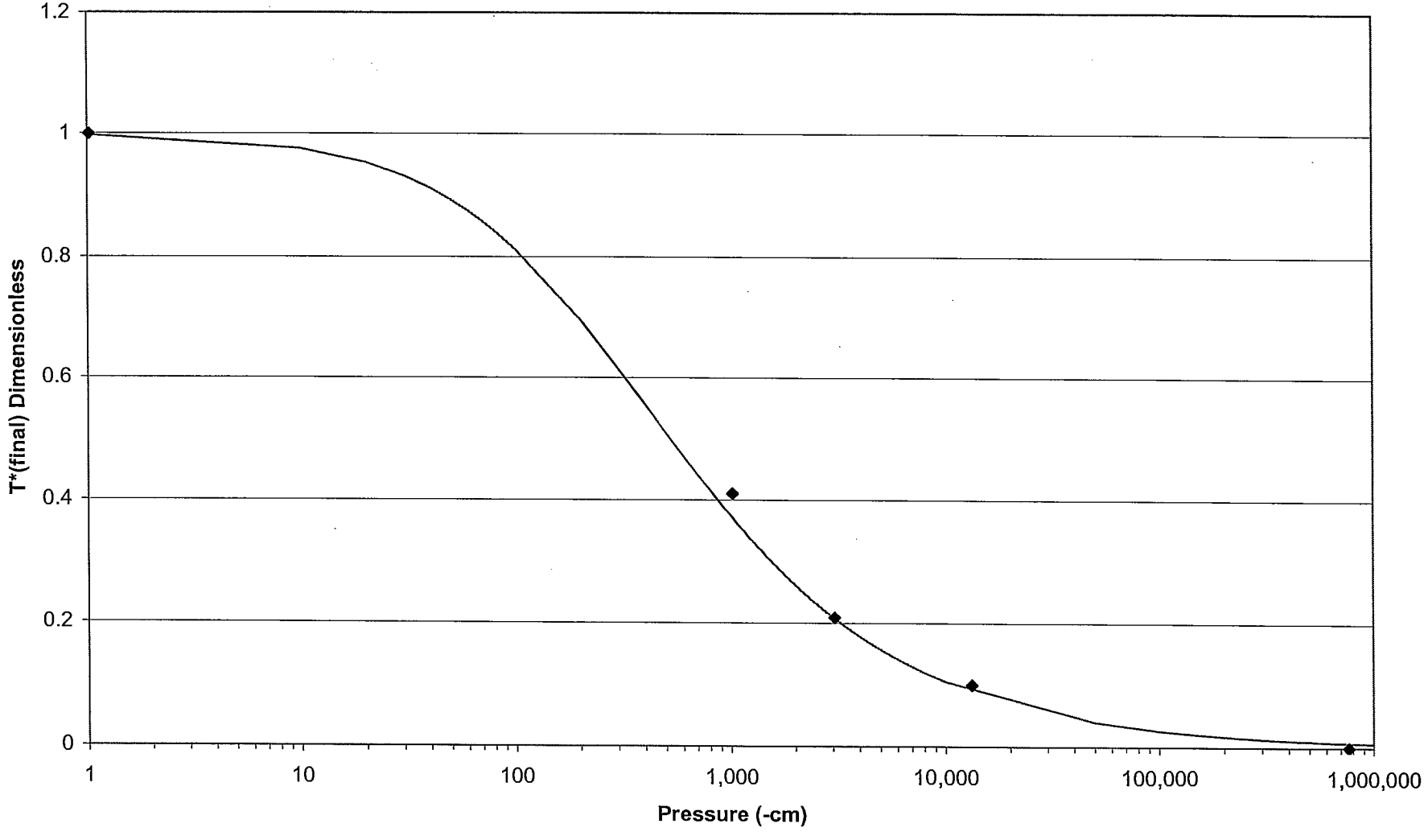
T*(final) vs Pressure

Campbell Scientific 229 Heat Dissipation Sensor SN: 10209



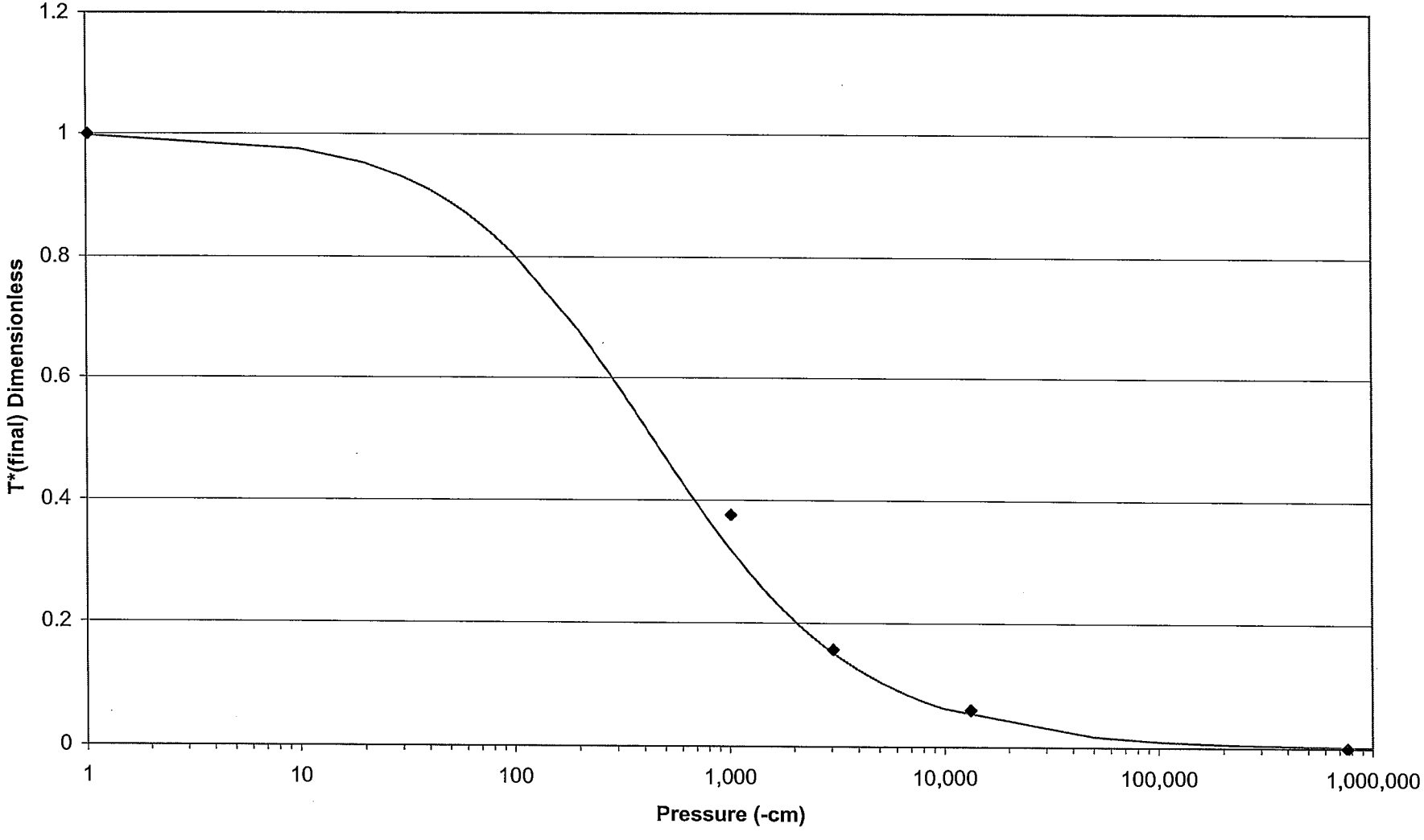
T*(final) vs Pressure

Campbell Scientific 229 Heat Dissipation Sensor SN: 10204



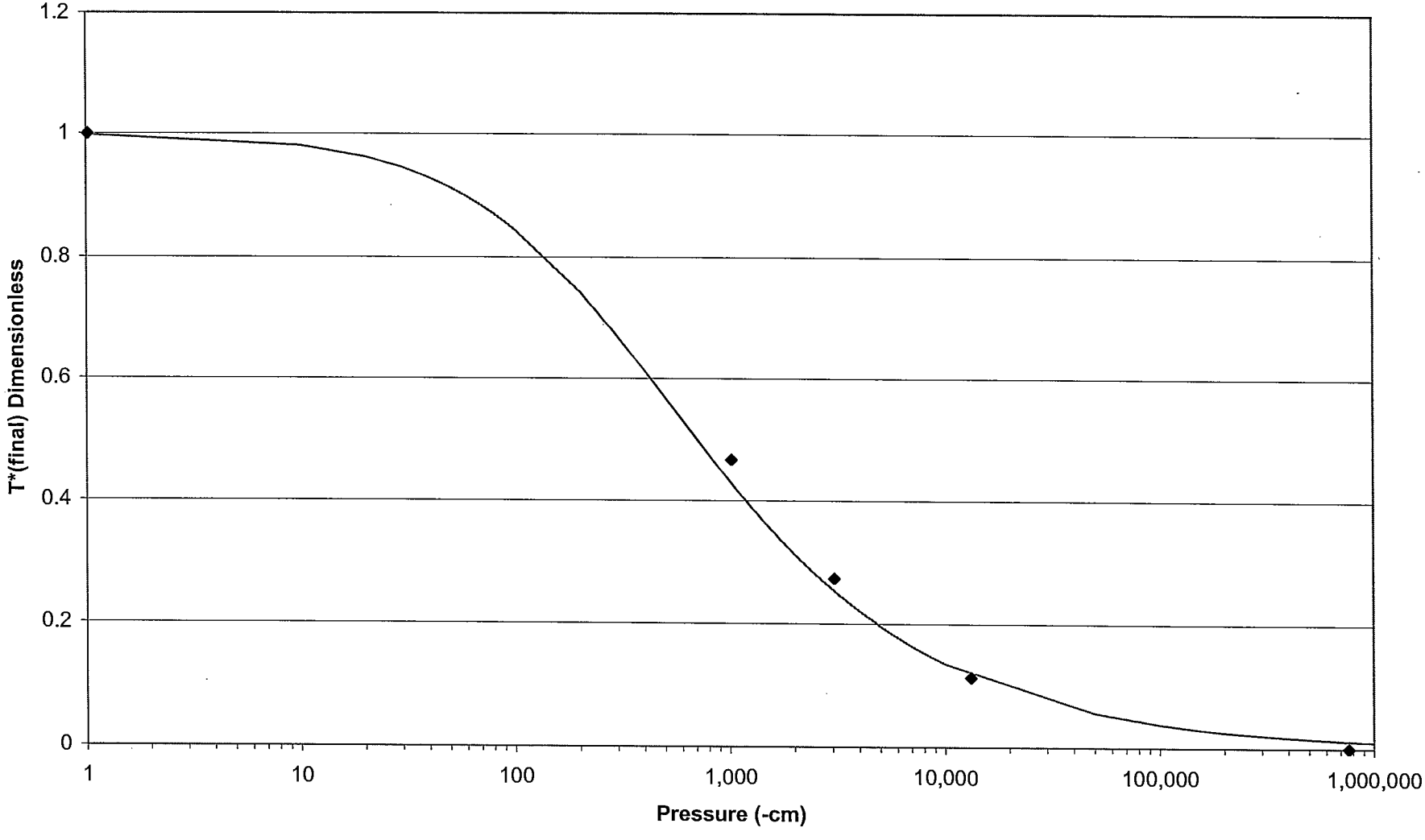
T*(final) vs Pressure

Campbell Scientific 229 Heat Dissipation Sensor SN: 10205



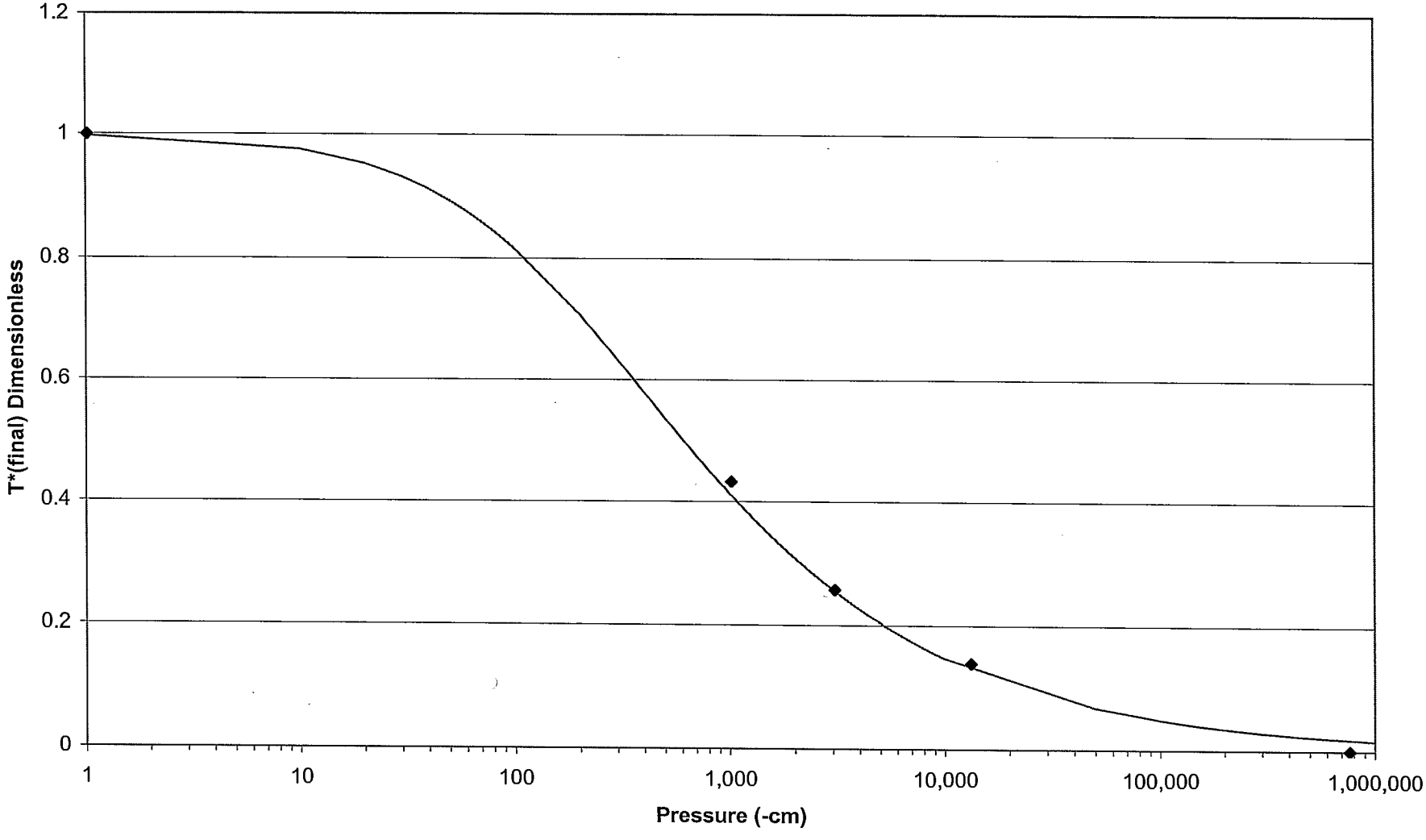
T*(final) vs Pressure

Campbell Scientific 229 Heat Dissipation Sensor SN: 10203



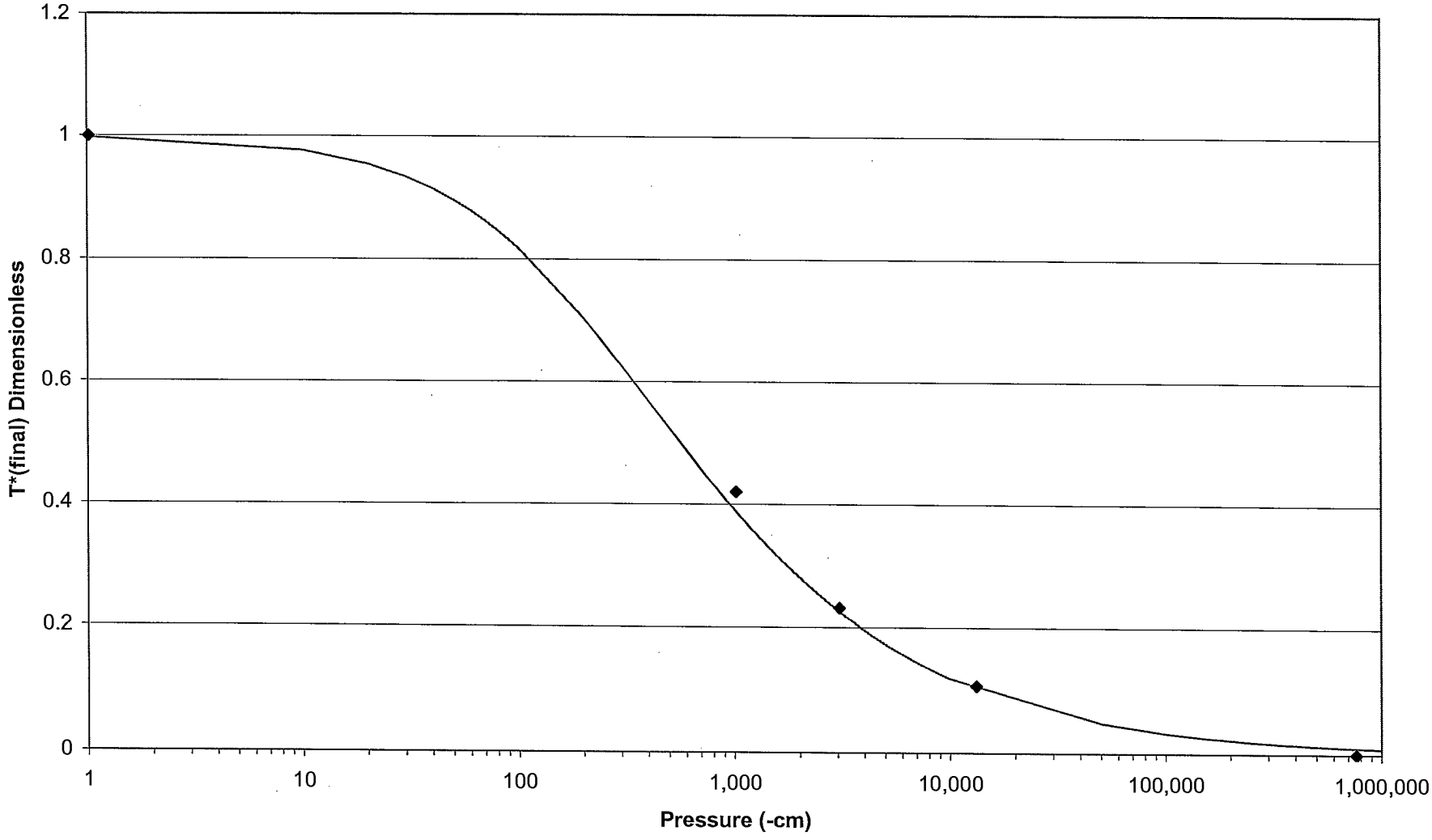
T*(final) vs Pressure

Campbell Scientific 229 Heat Dissipation Sensor SN: 10206



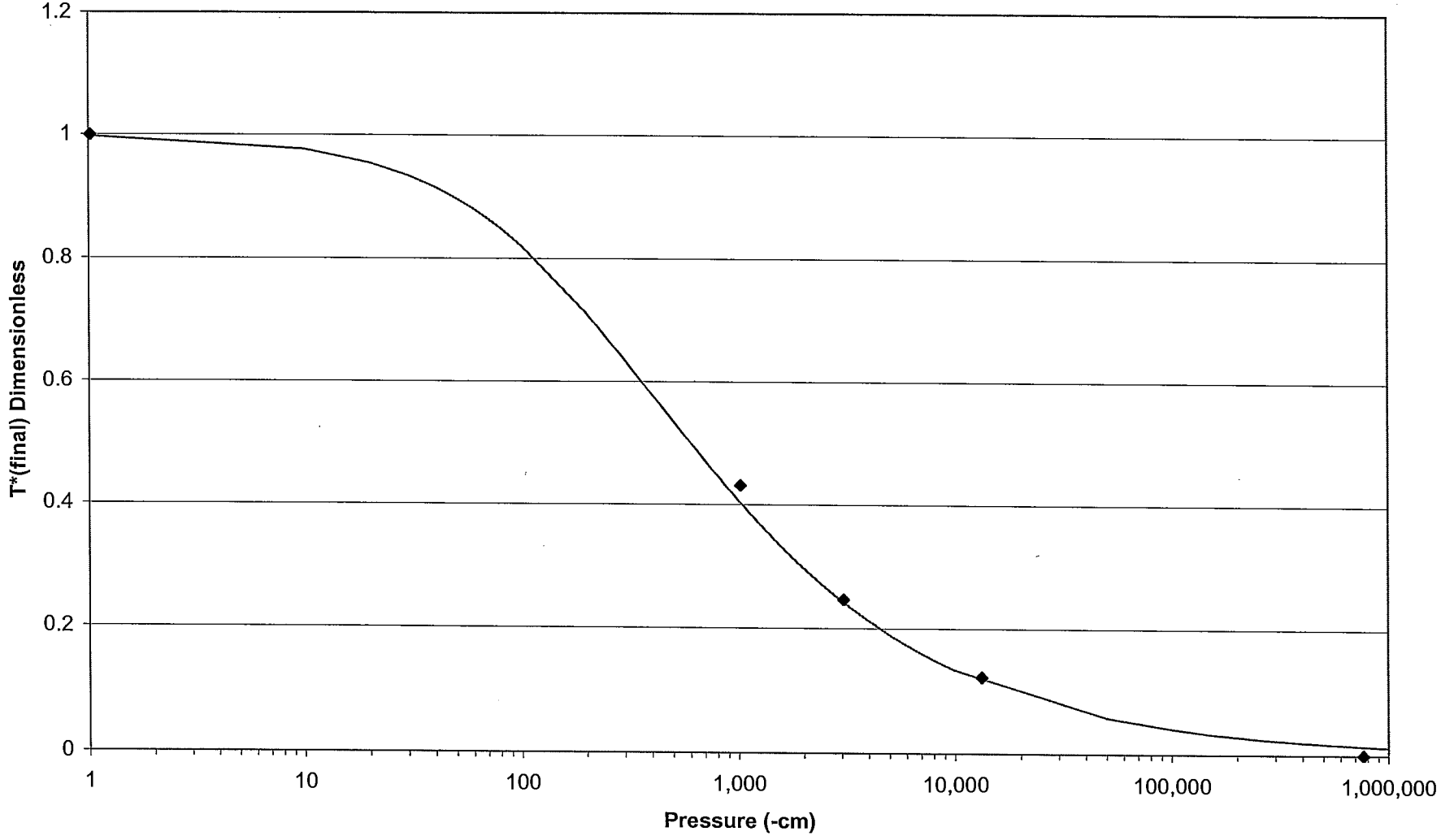
T*(final) vs Pressure

Campbell Scientific 229 Heat Dissipation Sensor SN: 10305



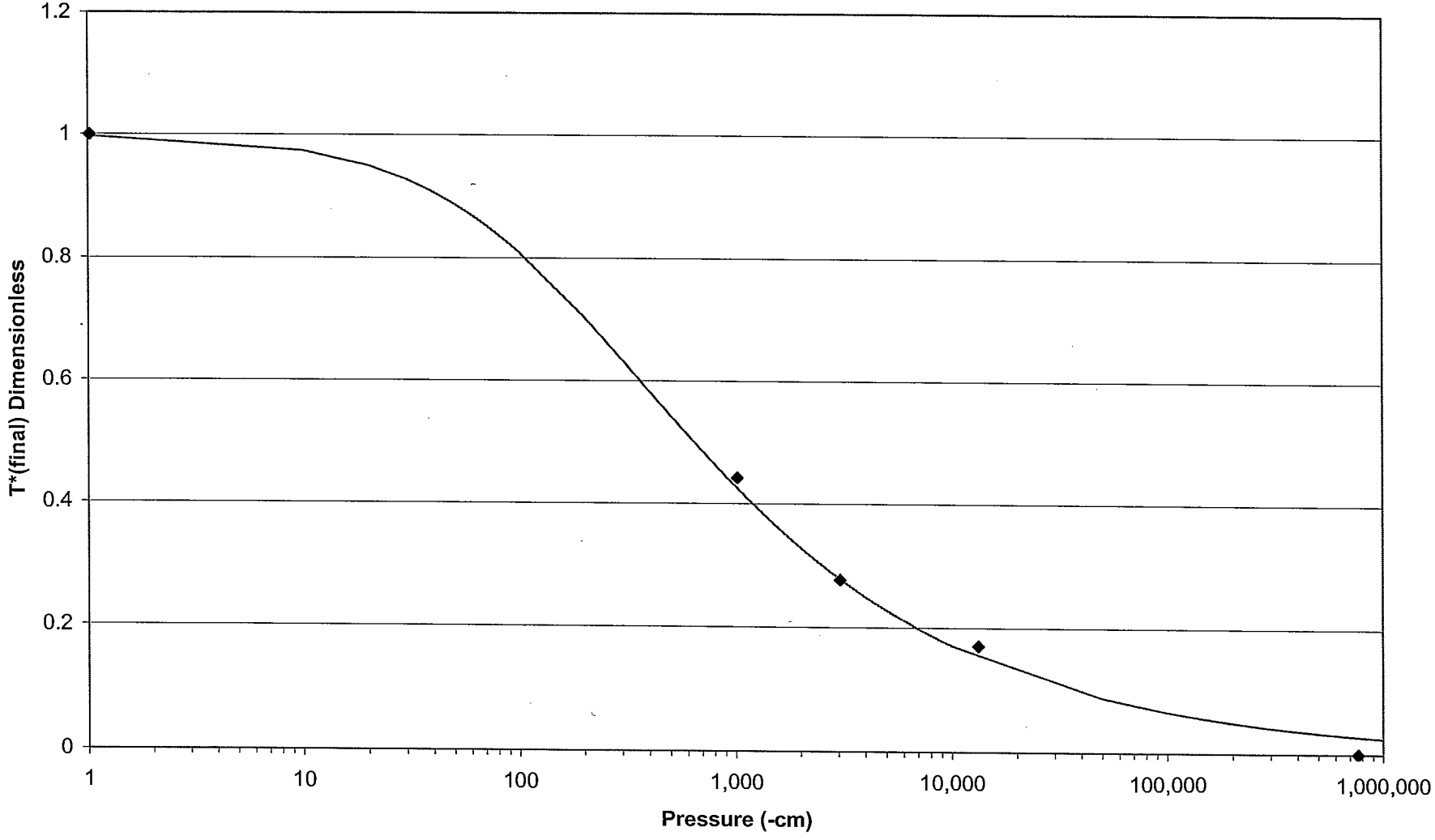
T*(final) vs Pressure

Campbell Scientific 229 Heat Dissipation Sensor SN: 10306



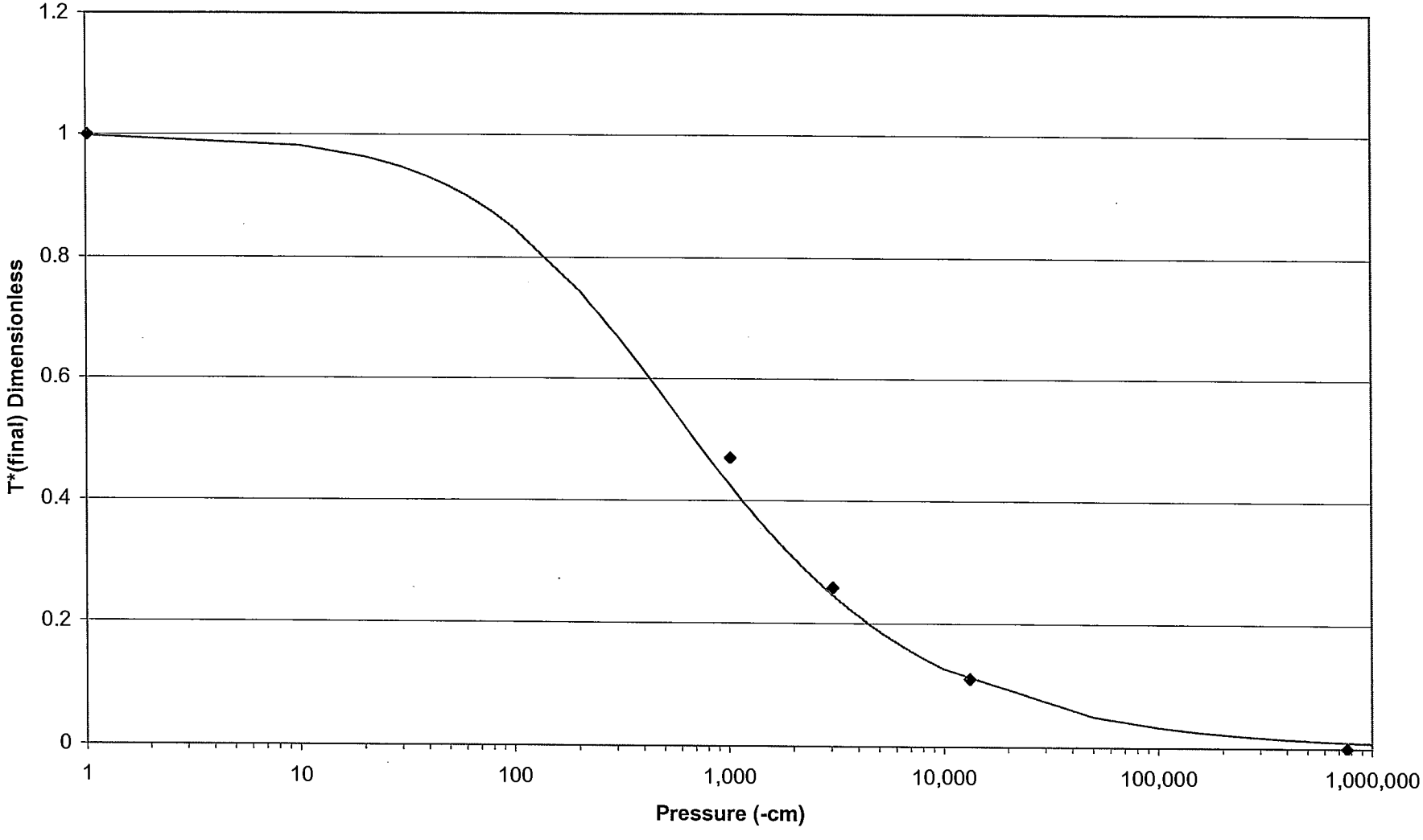
T*(final) vs Pressure

Campbell Scientific 229 Heat Dissipation Sensor SN: 10308



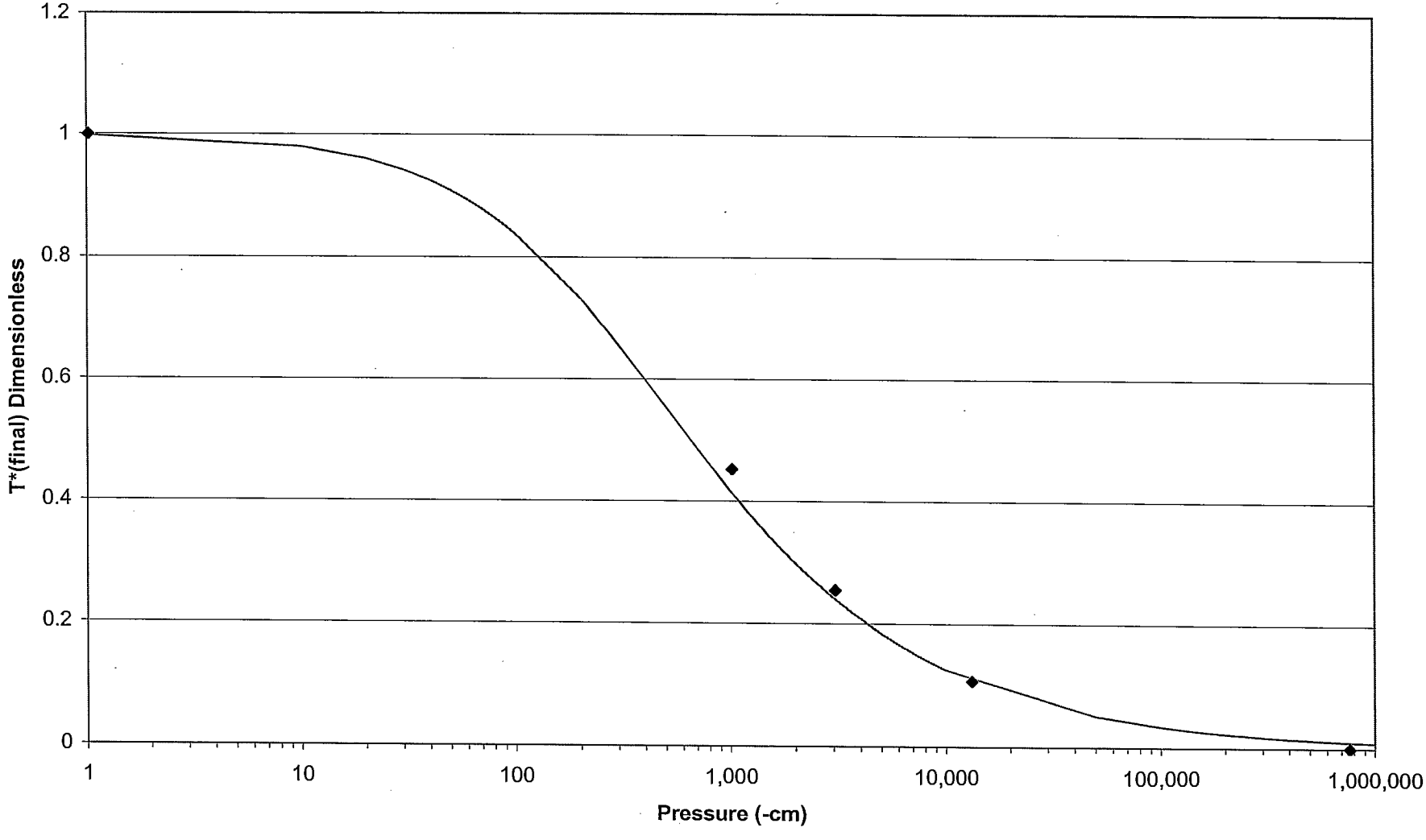
T*(final) vs Pressure

Campbell Scientific 229 Heat Dissipation Sensor SN: 10307



T*(final) vs Pressure

Campbell Scientific 229 Heat Dissipation Sensor SN: 10340



Calibration Coefficients

Sensor SN:	Alpha	N	deltaT(dry)	deltaT(wet)
10167	0.0035	1.6055	2.736	0.741
10168	0.0041	1.5580	2.791	0.742
10169	0.0035	1.6690	2.574	0.725
10170	0.0070	1.4995	2.62	0.717
10161	0.0033	1.6274	2.701	0.75
10162	0.0036	1.6205	2.796	0.717
10163	0.0045	1.5315	2.775	0.701
10164	0.0036	1.6827	2.963	0.709
10165	0.0032	1.5612	2.473	0.741
10166	0.0057	1.4599	2.564	0.7
10200	0.0036	1.6821	2.607	0.685
10201	0.0042	1.5795	2.642	0.693
10199	0.0045	1.6134	2.548	0.701
10198	0.0031	1.6270	2.523	0.692
10197	0.0034	1.6732	2.633	0.619
10196	0.0029	1.6252	2.676	0.692

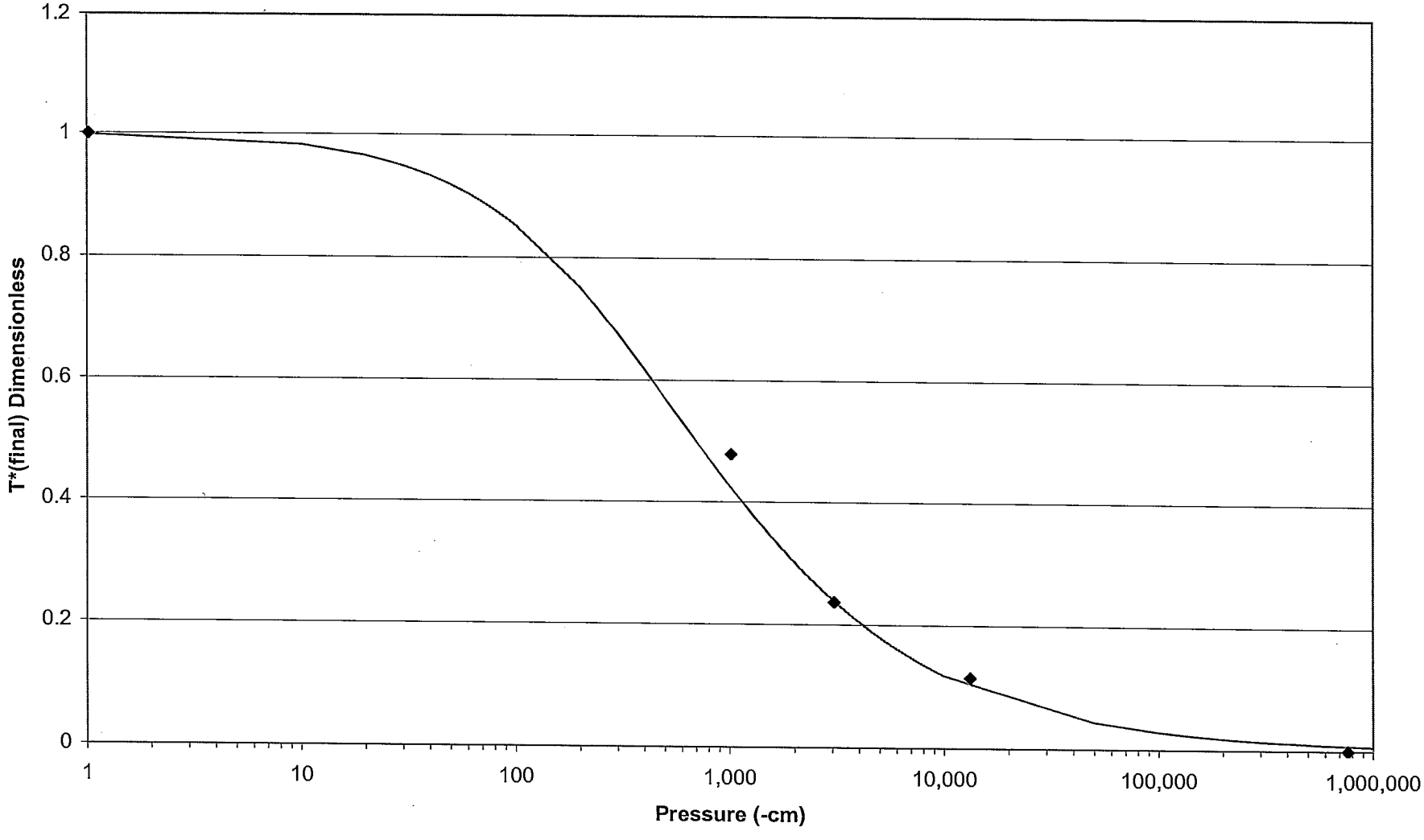
Batch 4.2

Calibration Data Points

	T* by Probe Serial Number															
Pressure (cm)	**10167**	**10168**	**10169**	**10170**	**10161**	**10162**	**10163**	**10164**	**10165**	**10166**	**9646**	**10201**	**10199**	**10198**	**10197**	**10196**
764,850	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1,020	0.450	0.436	0.410	0.372	0.446	0.432	0.435	0.398	0.487	0.436	0.395	0.416	0.380	0.461	0.414	0.479
3,059	0.226	0.242	0.203	0.205	0.226	0.206	0.236	0.182	0.286	0.262	0.196	0.220	0.195	0.244	0.212	0.237
13,257	0.113	0.113	0.079	0.118	0.101	0.110	0.128	0.086	0.118	0.150	0.070	0.105	0.086	0.098	0.072	0.116

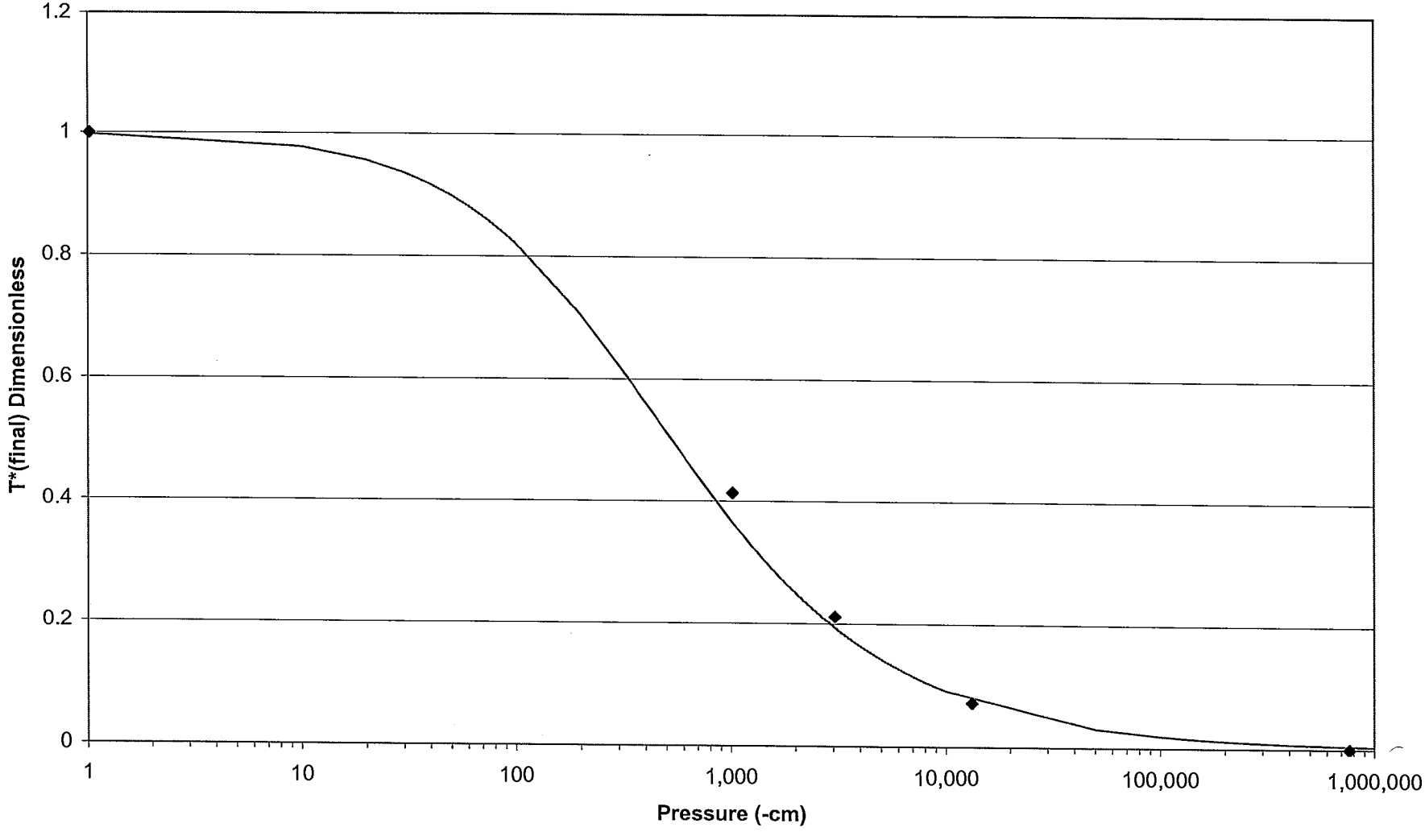
T*(final) vs Pressure

Campbell Scientific 229 Heat Dissipation Sensor SN: 10196



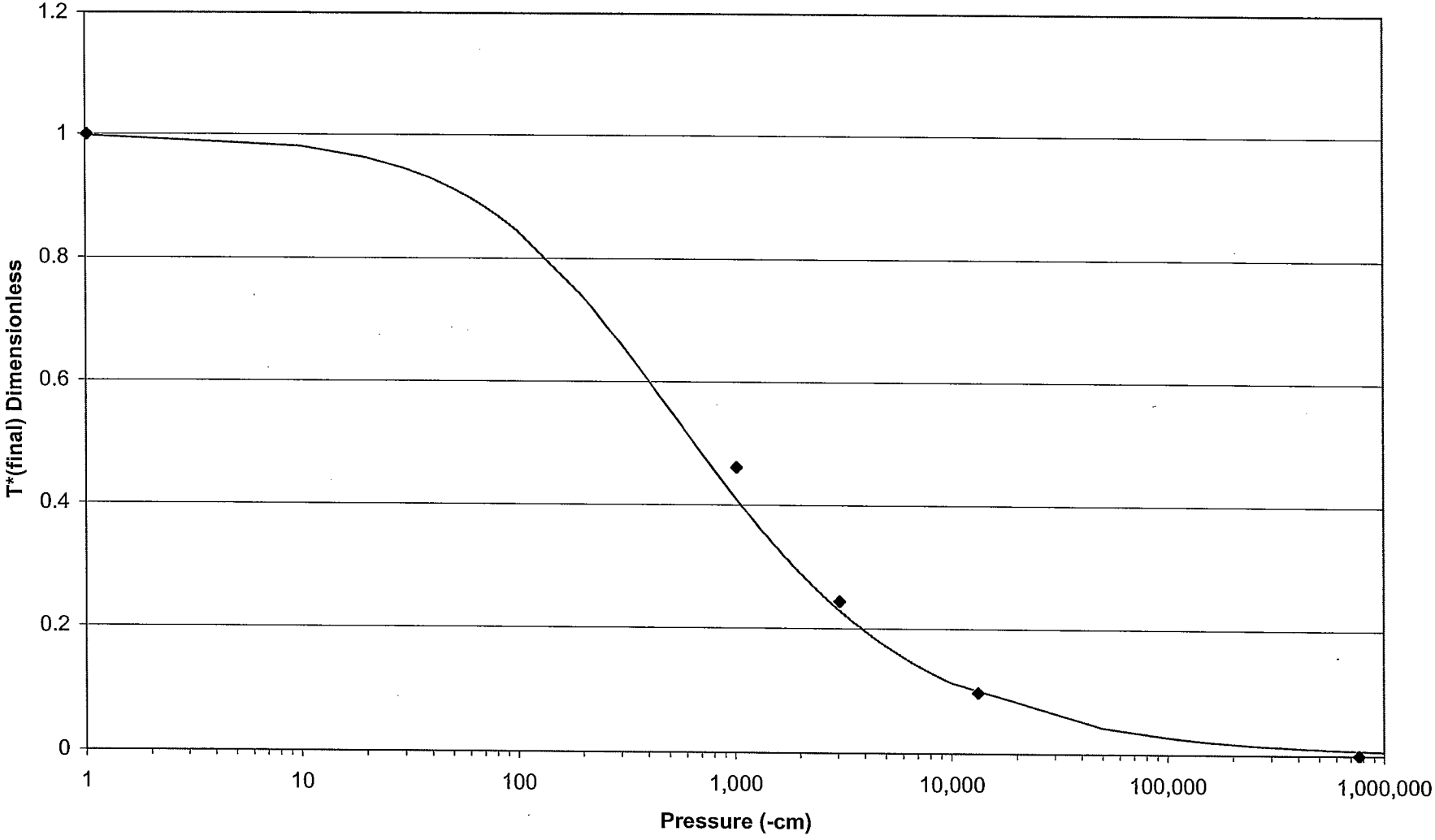
T*(final) vs Pressure

Campbell Scientific 229 Heat Dissipation Sensor SN: 10197



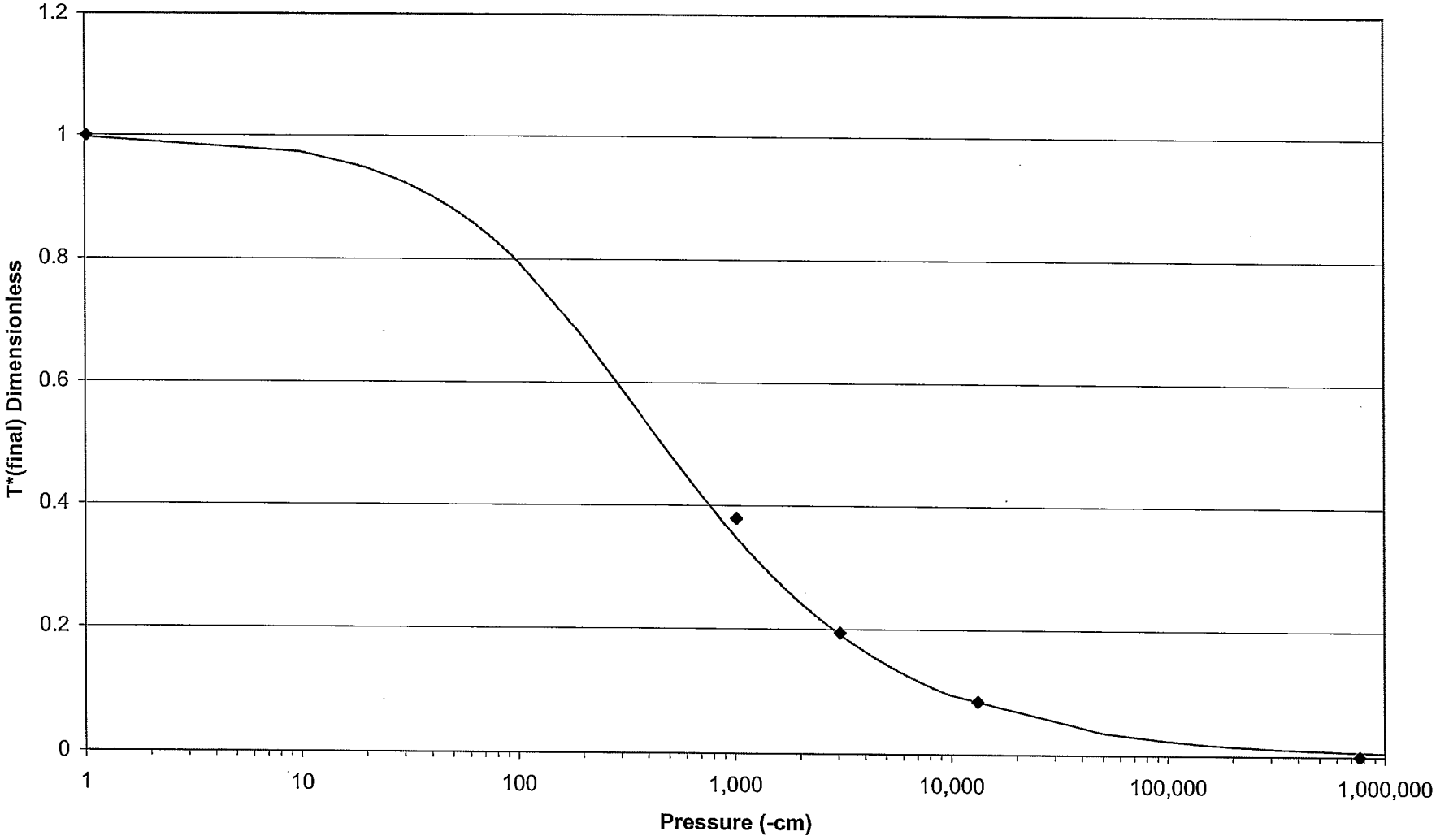
T*(final) vs Pressure

Campbell Scientific 229 Heat Dissipation Sensor SN: 10198



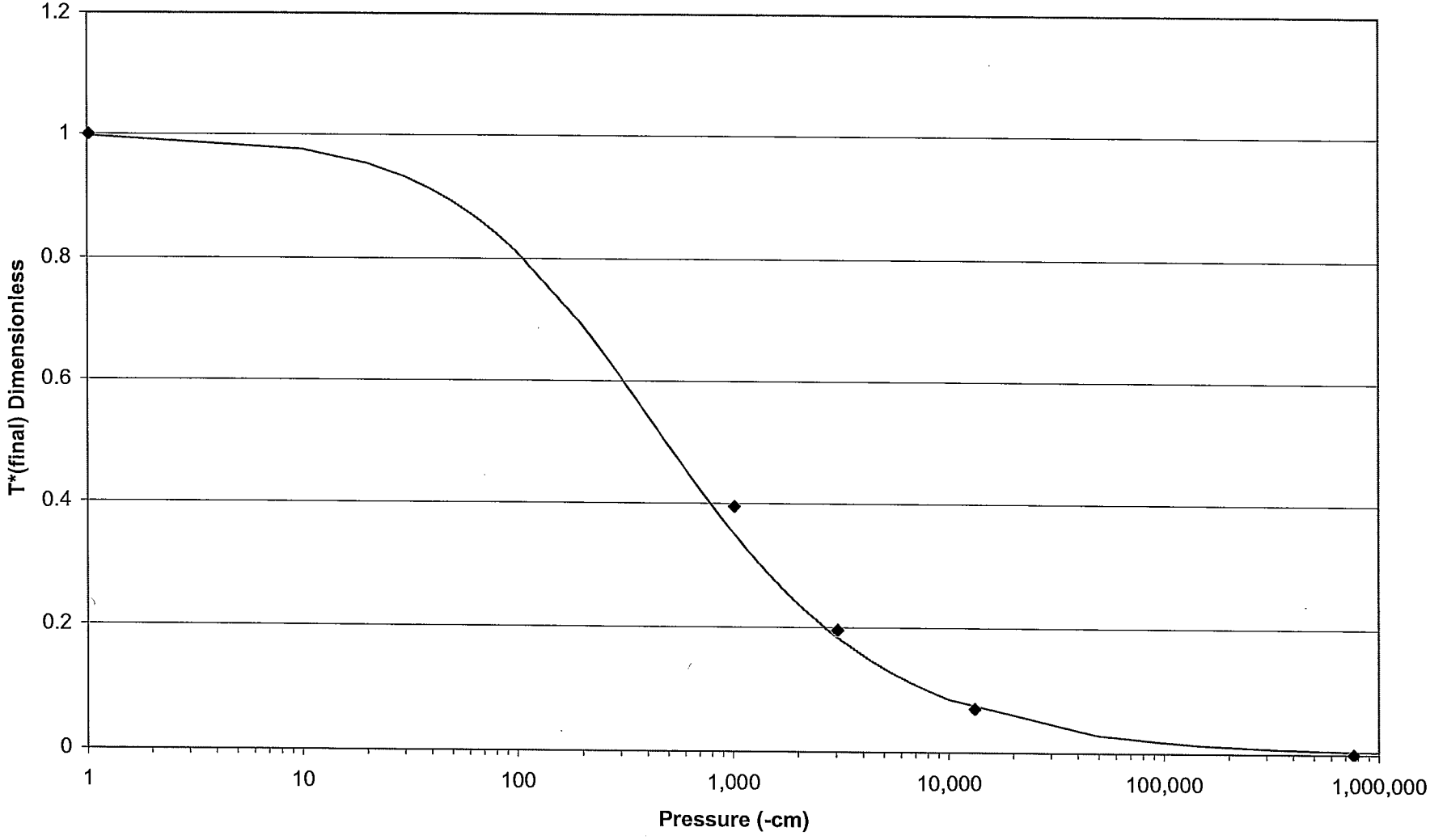
T*(final) vs Pressure

Campbell Scientific 229 Heat Dissipation Sensor SN: 10199



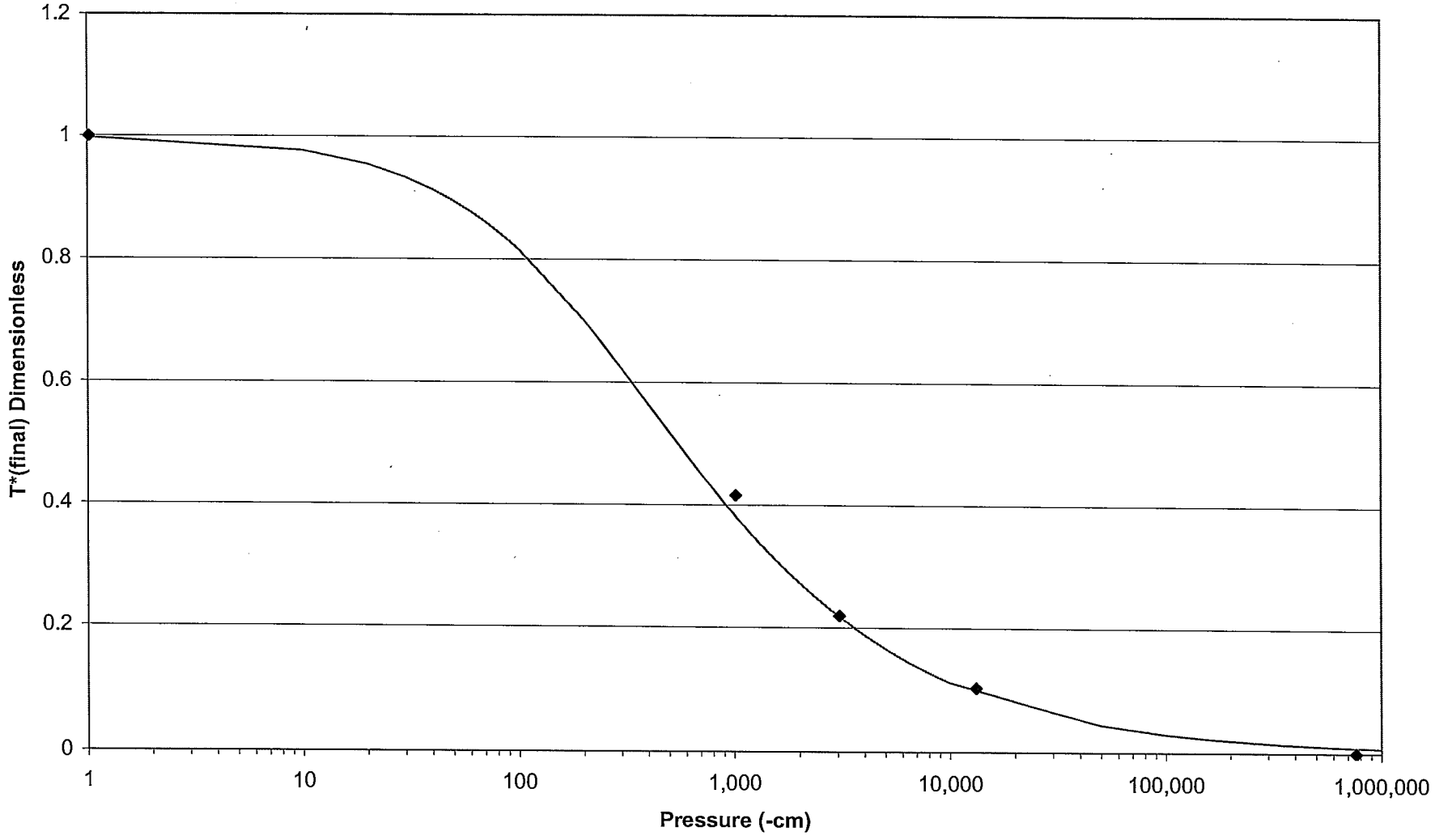
T*(final) vs Pressure

Campbell Scientific 229 Heat Dissipation Sensor SN: 10200



T*(final) vs Pressure

Campbell Scientific 229 Heat Dissipation Sensor SN: 10201



Calibration Coefficients

Sensor SN:	Alpha	N	deltaT(dry)	deltaT(wet)
10338	0.0040	1.5548	2.828	0.717
10339	0.0037	1.6391	2.828	0.749
10325	0.0040	1.5787	2.776	0.757
10326	0.0076	1.4842	2.679	0.716
10327	0.0037	1.5986	2.68	0.717
10328	0.0031	1.7345	2.769	0.733
10329	0.0034	1.7163	2.782	0.709
10317	0.0039	1.6621	2.69	0.684
10318	0.0040	1.4604	3.015	0.7
10319	0.0045	1.5656	2.633	0.748
10320	0.0047	1.5319	2.516	0.692
10323	0.0044	1.5211	2.767	0.748
10324	0.0055	1.4951	2.771	0.757
10322	0.0033	1.5946	2.701	0.7
10321	0.0037	1.5378	2.597	0.733
10337	0.0028	1.6451	2.811	0.749

Golder

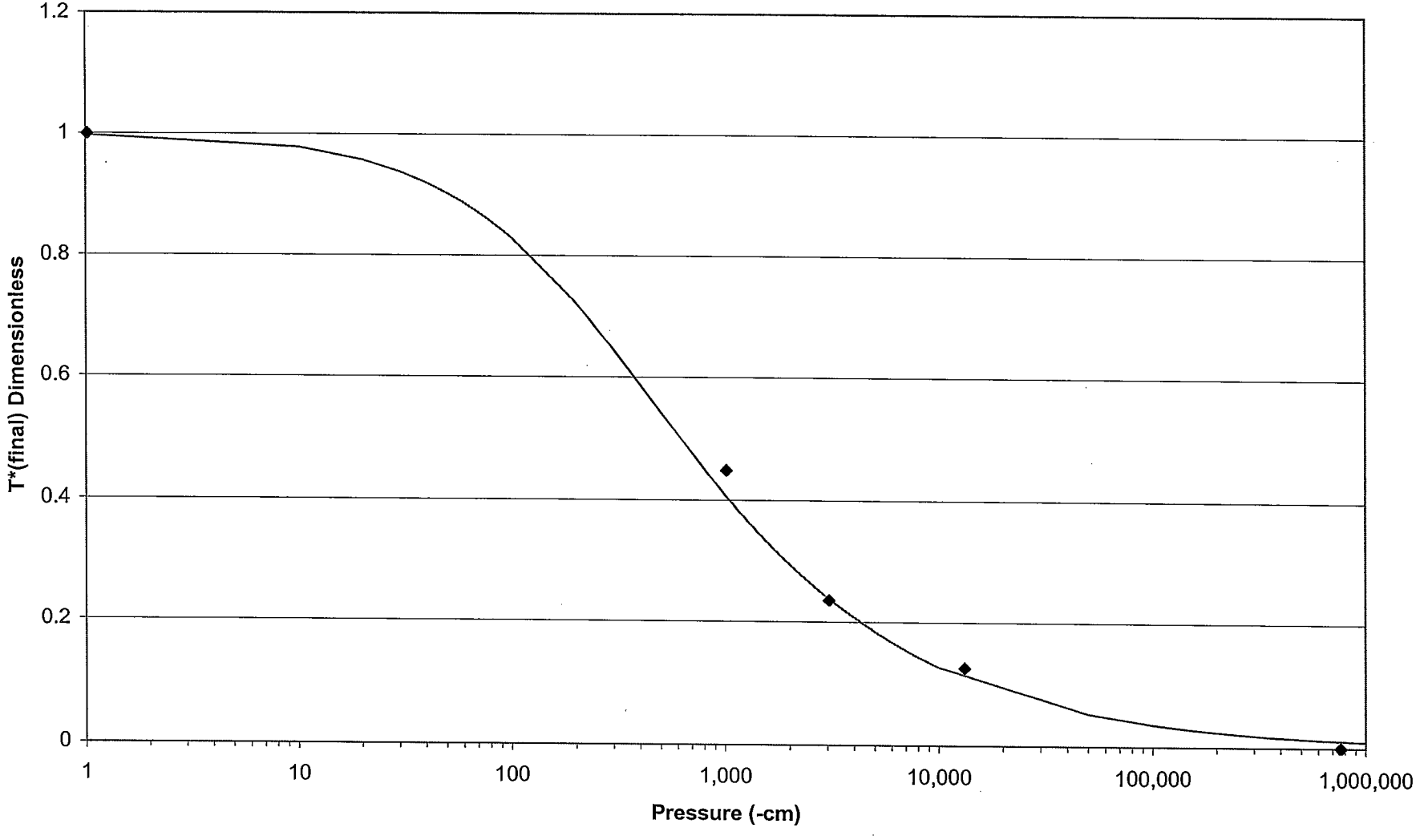
Batch 4.3

Calibration Data Points

	T* by Probe Serial Number															
Pressure (cm)	**10338**	**10339**	**10325**	**10326**	**10327**	**10328**	**10329**	**10317**	**10318**	**10319**	**9646**	**10323**	**10324**	**10322**	**10321**	**10337**
764,850	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1,020	0.448	0.412	0.427	0.369	0.436	0.411	0.391	0.389	0.497	0.408	0.422	0.443	0.417	0.462	0.466	0.480
3,059	0.236	0.216	0.228	0.208	0.227	0.182	0.182	0.180	0.317	0.225	0.238	0.254	0.242	0.252	0.270	0.236
13,257	0.126	0.081	0.107	0.122	0.106	0.080	0.069	0.087	0.166	0.102	0.118	0.127	0.130	0.107	0.125	0.110

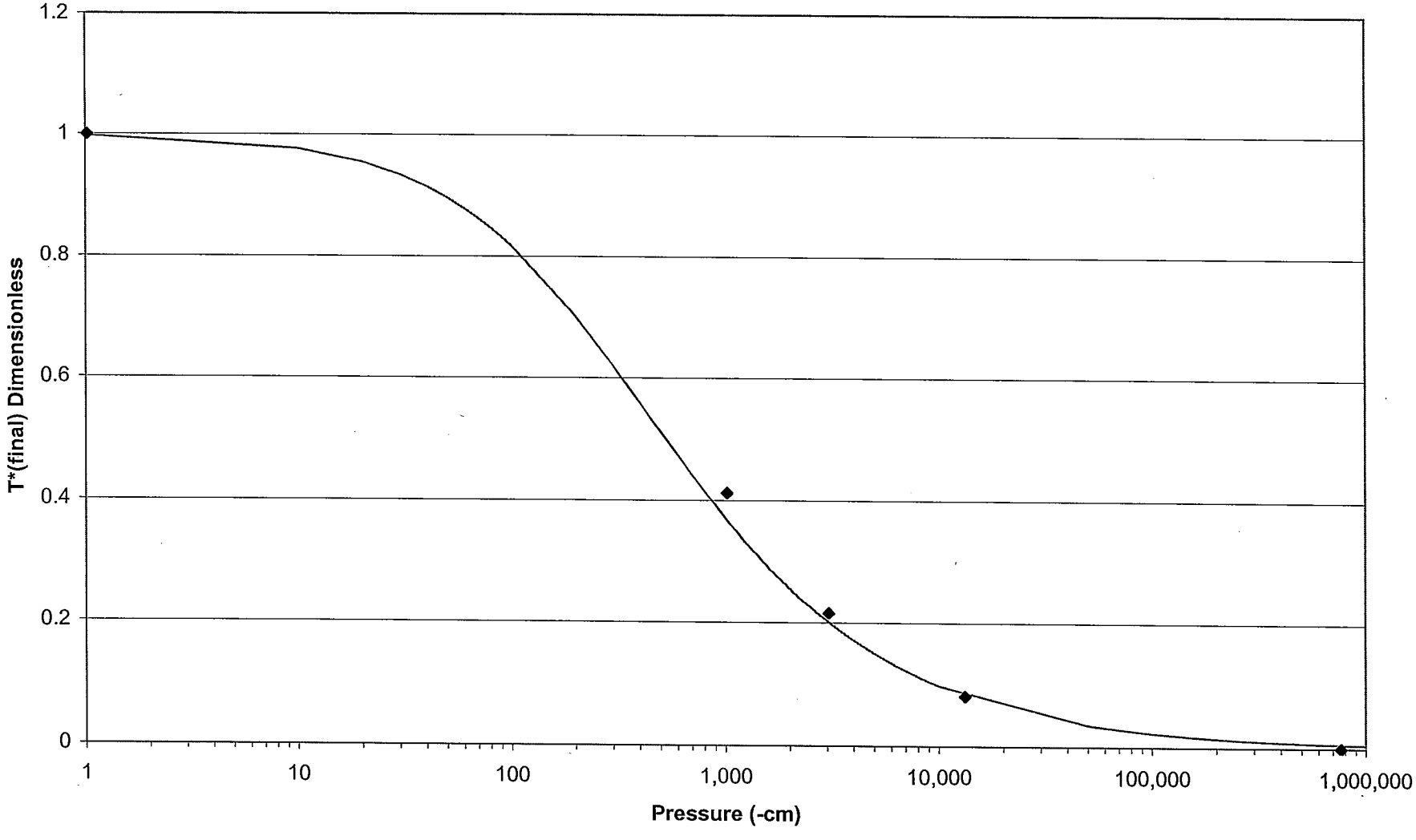
T*(final) vs Pressure

Campbell Scientific 229 Heat Dissipation Sensor SN: 10338



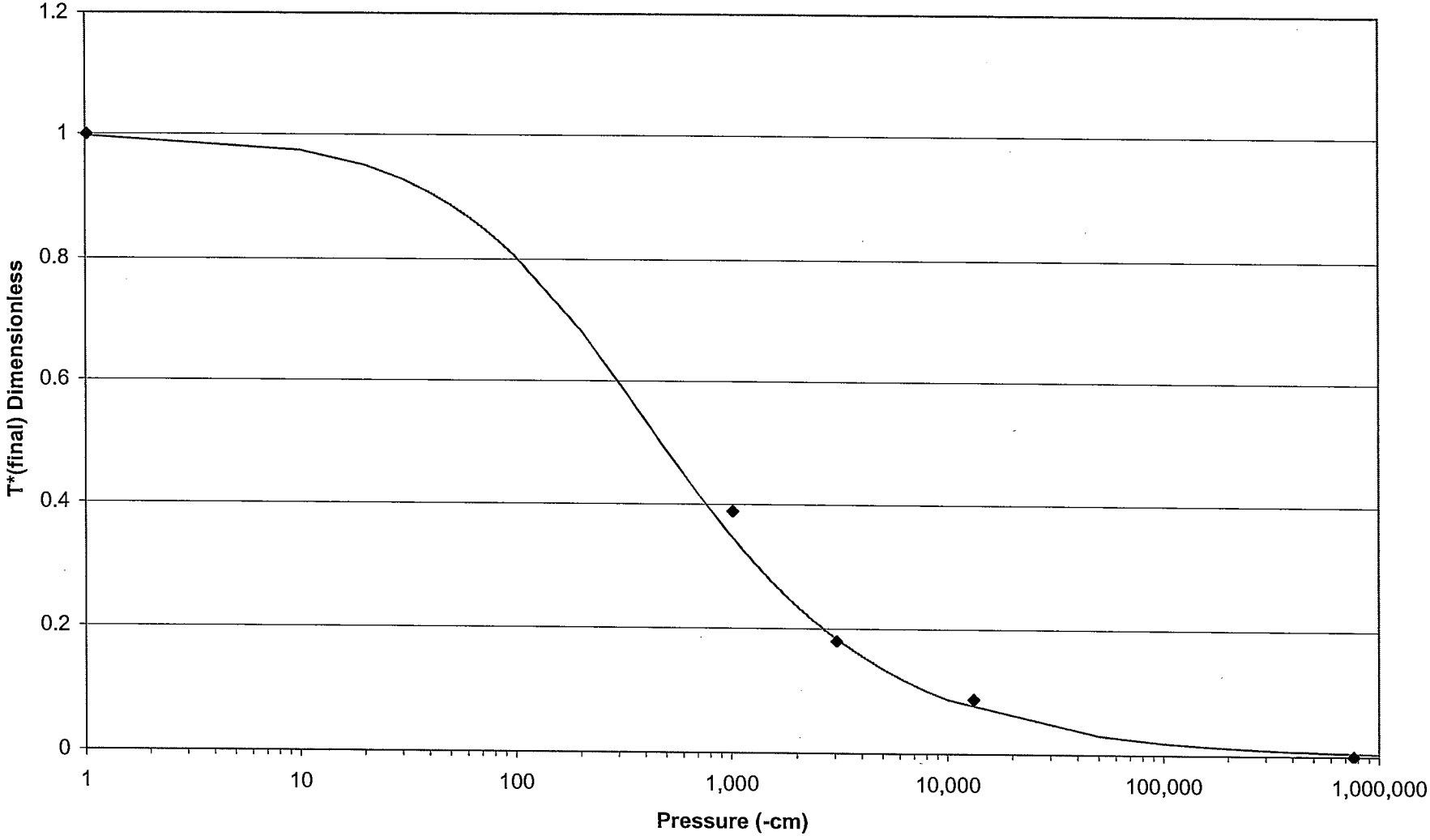
T*(final) vs Pressure

Campbell Scientific 229 Heat Dissipation Sensor SN: 10339



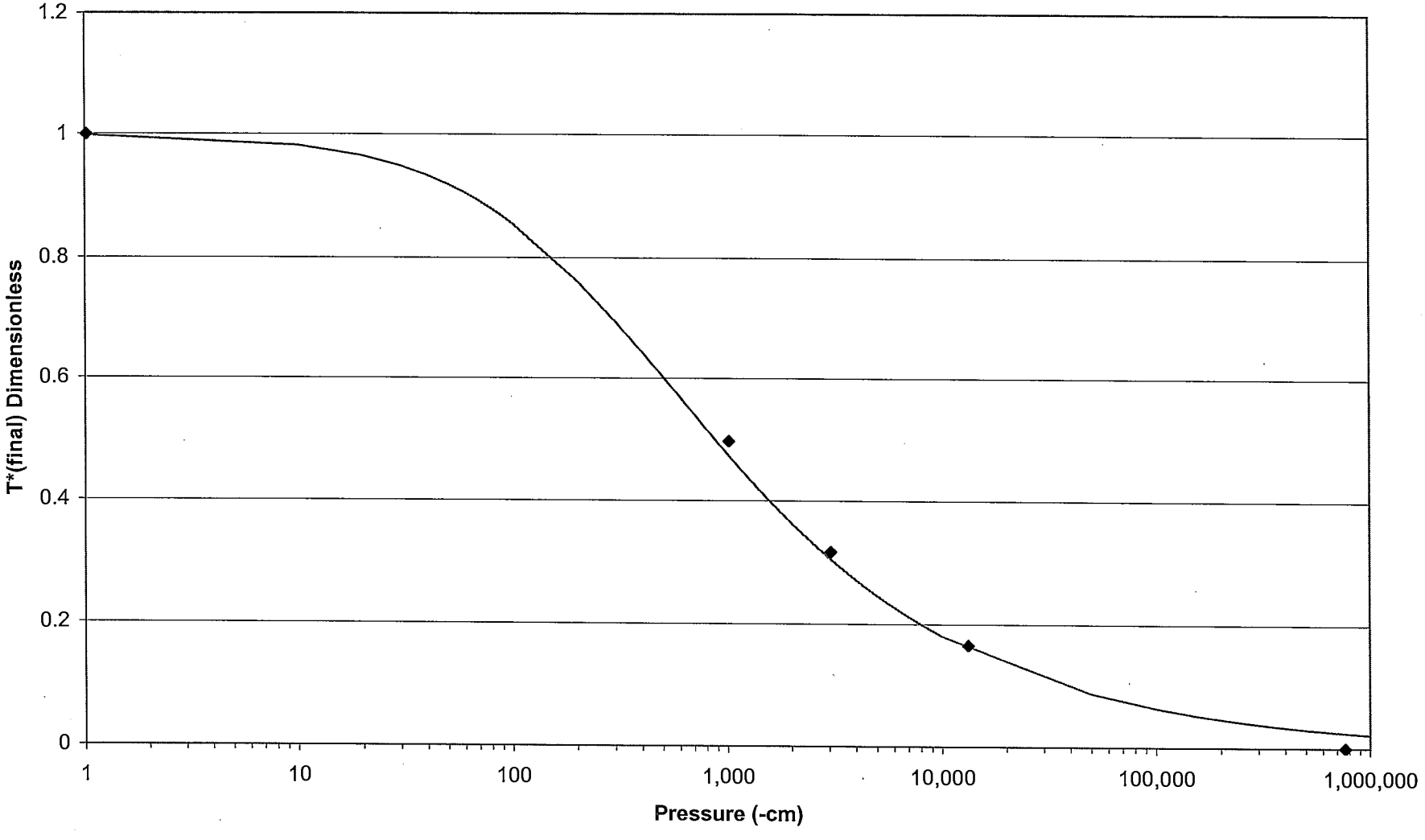
T*(final) vs Pressure

Campbell Scientific 229 Heat Dissipation Sensor SN: 10317



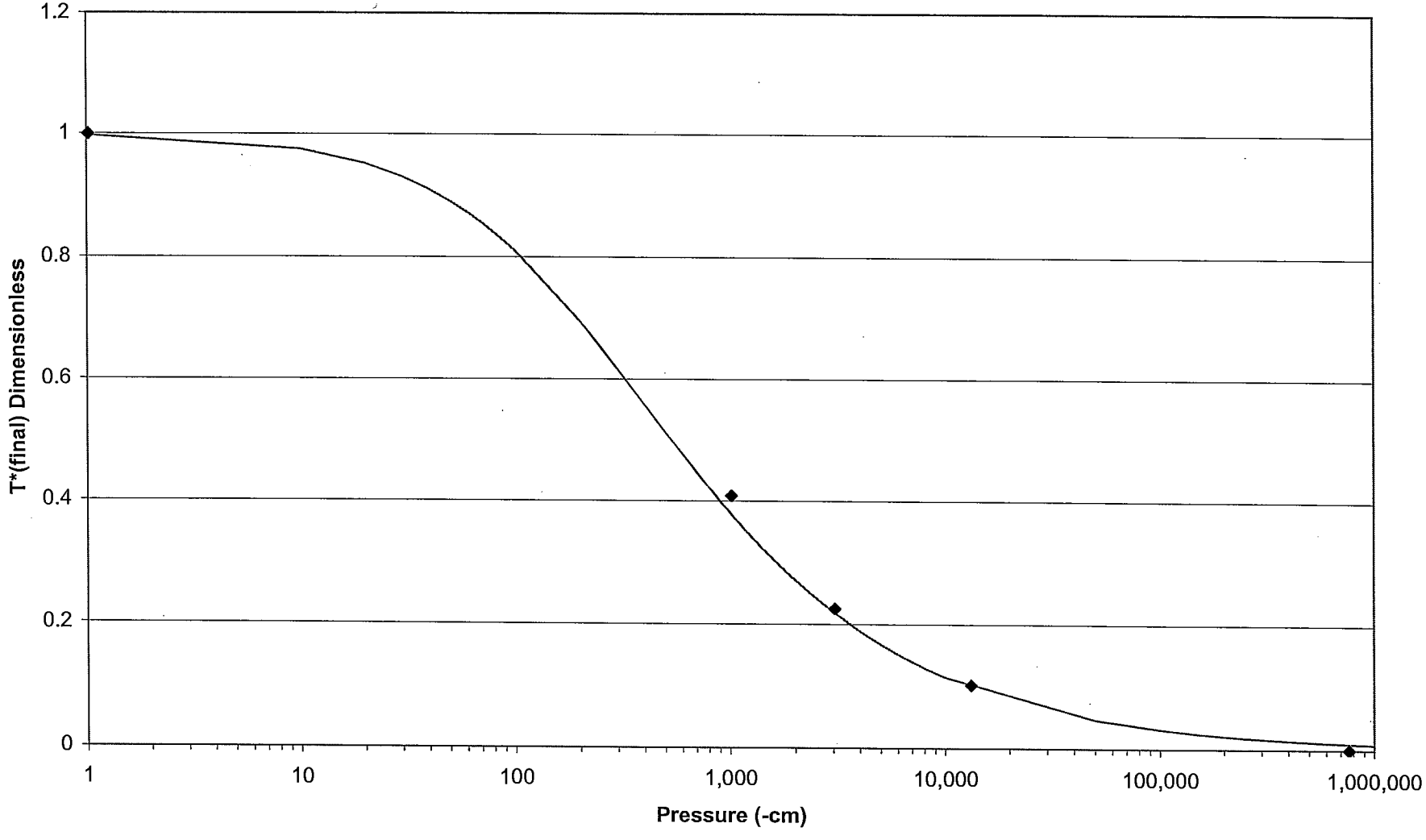
T*(final) vs Pressure

Campbell Scientific 229 Heat Dissipation Sensor SN: 10318



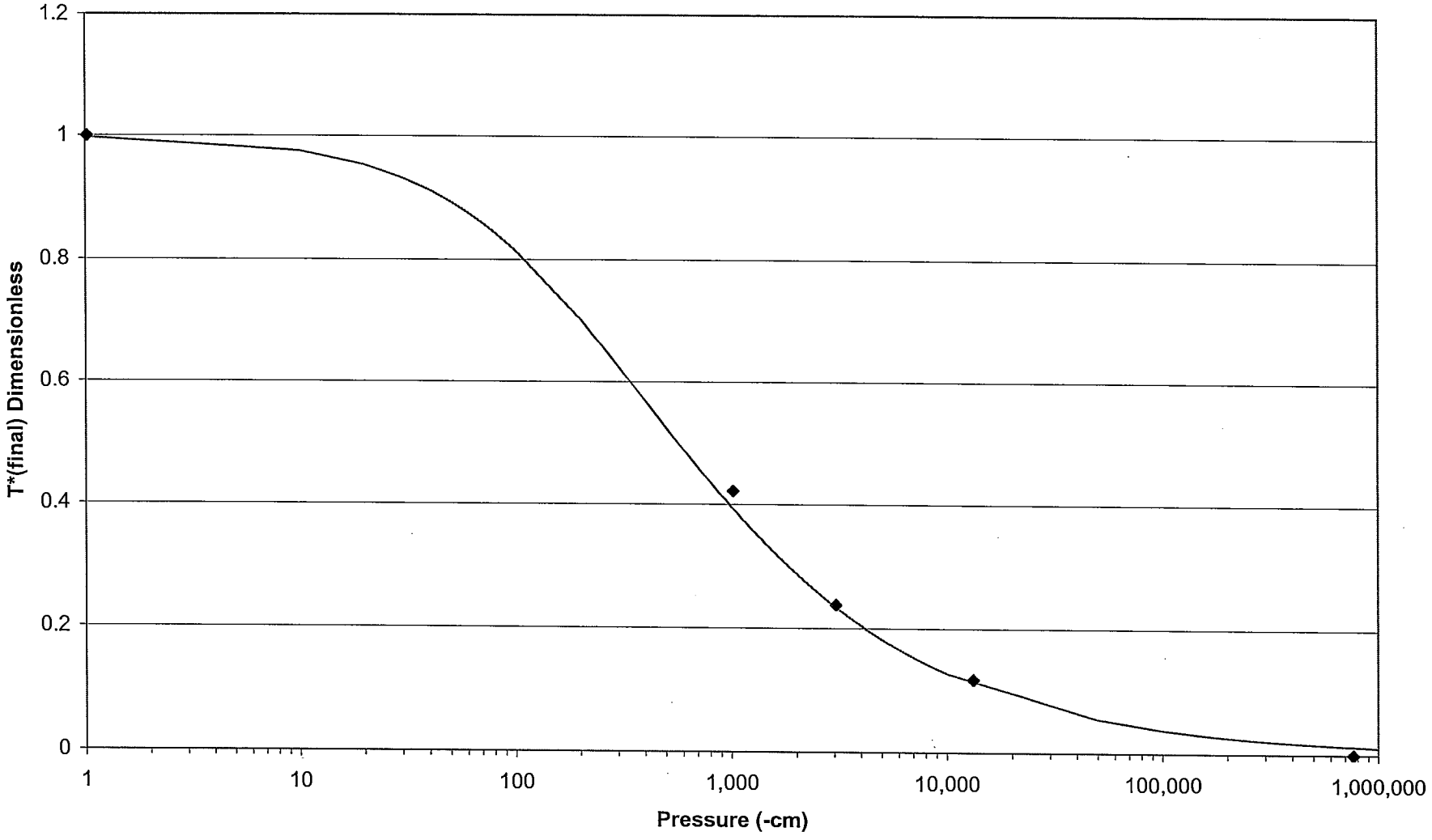
T*(final) vs Pressure

Campbell Scientific 229 Heat Dissipation Sensor SN: 10319



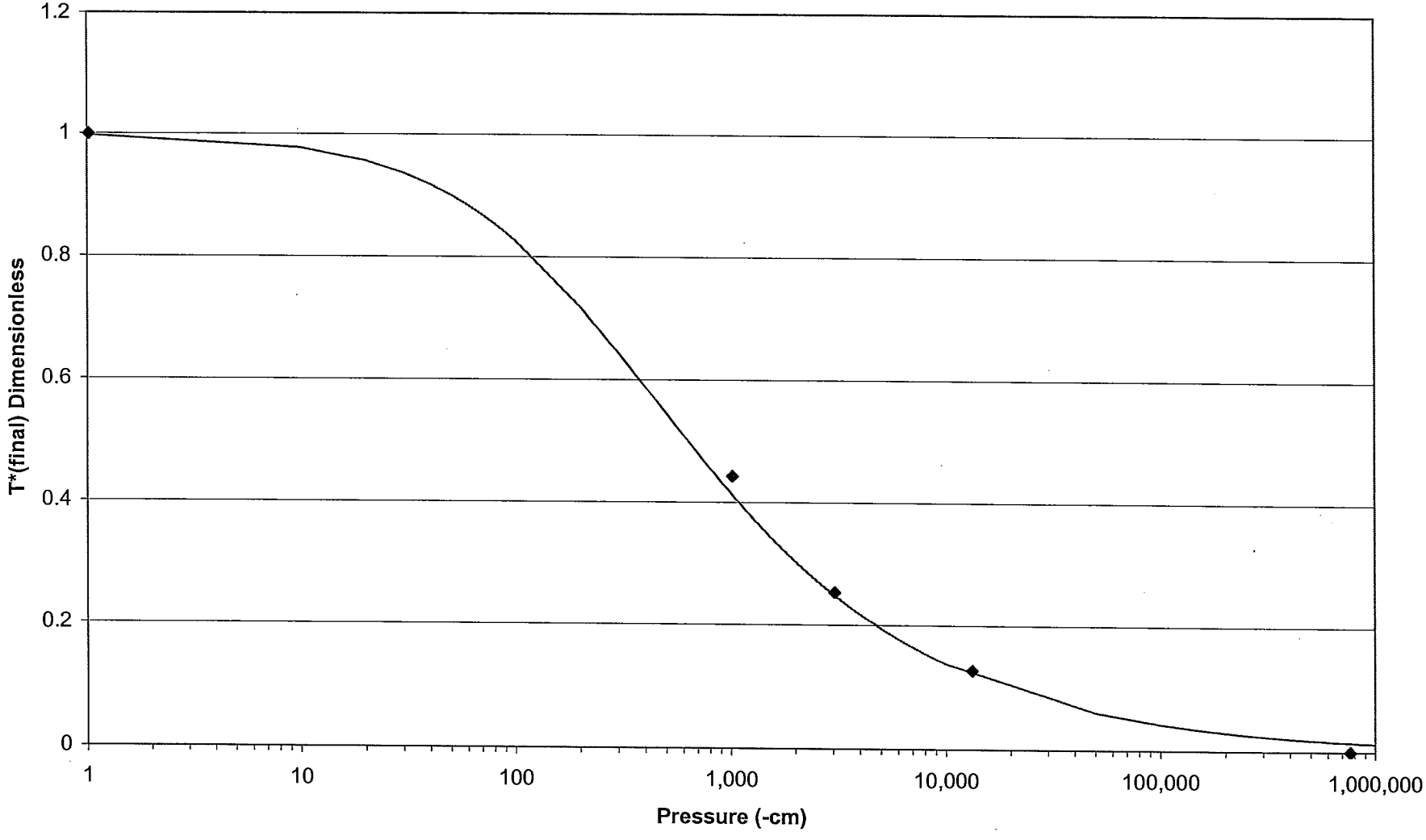
T*(final) vs Pressure

Campbell Scientific 229 Heat Dissipation Sensor SN: 10320



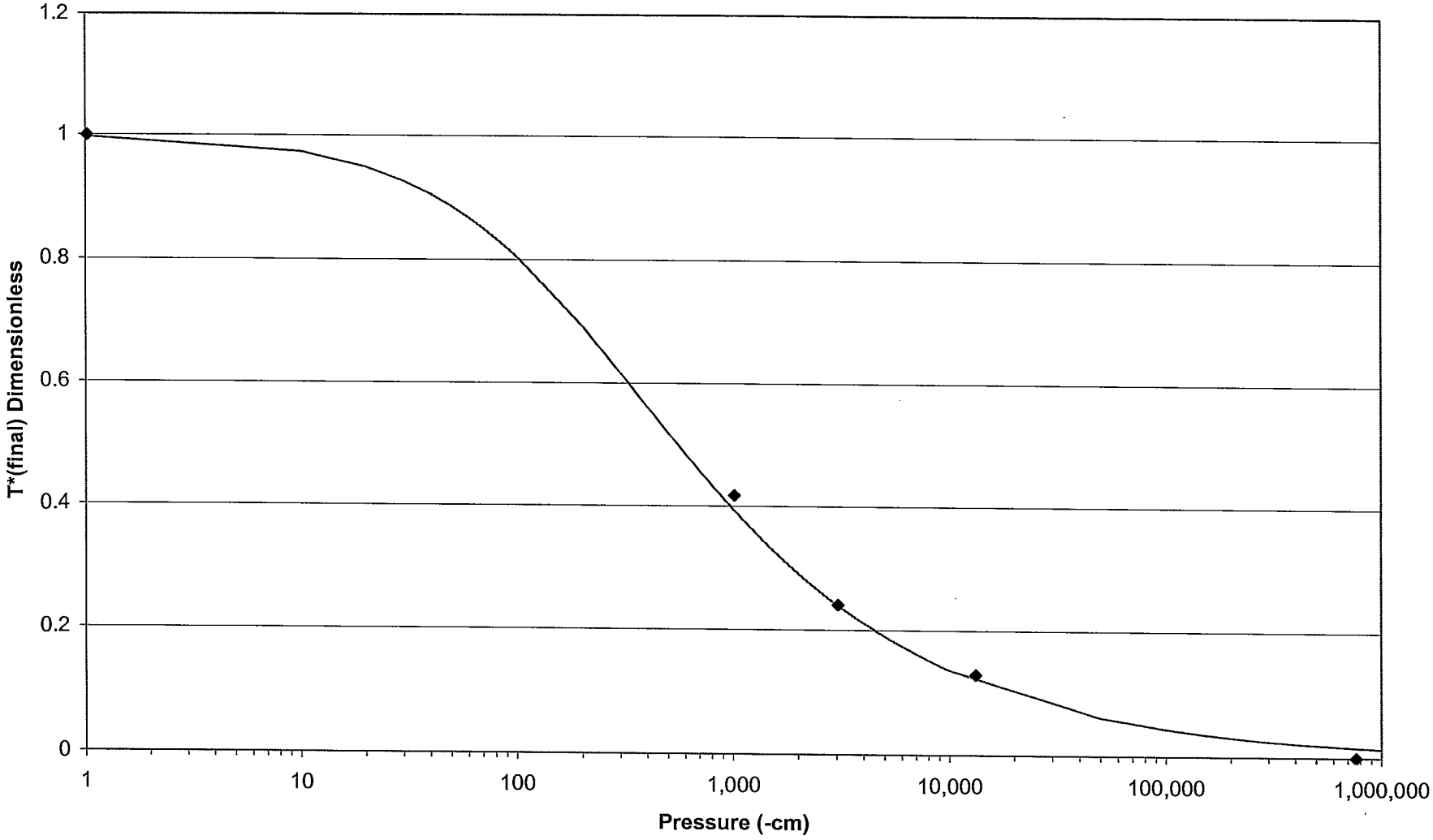
T*(final) vs Pressure

Campbell Scientific 229 Heat Dissipation Sensor SN: 10323



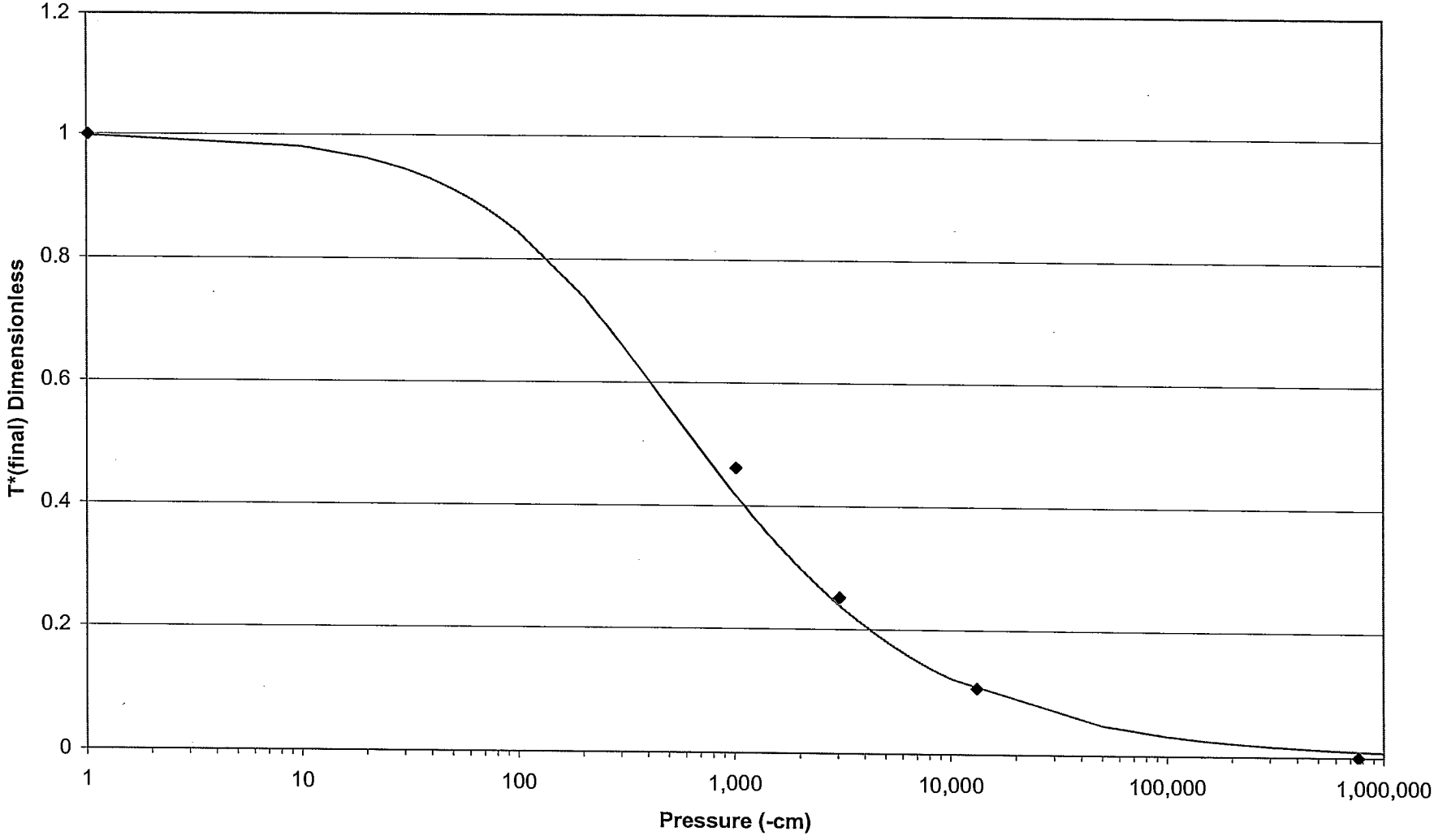
T*(final) vs Pressure

Campbell Scientific 229 Heat Dissipation Sensor SN: 10324



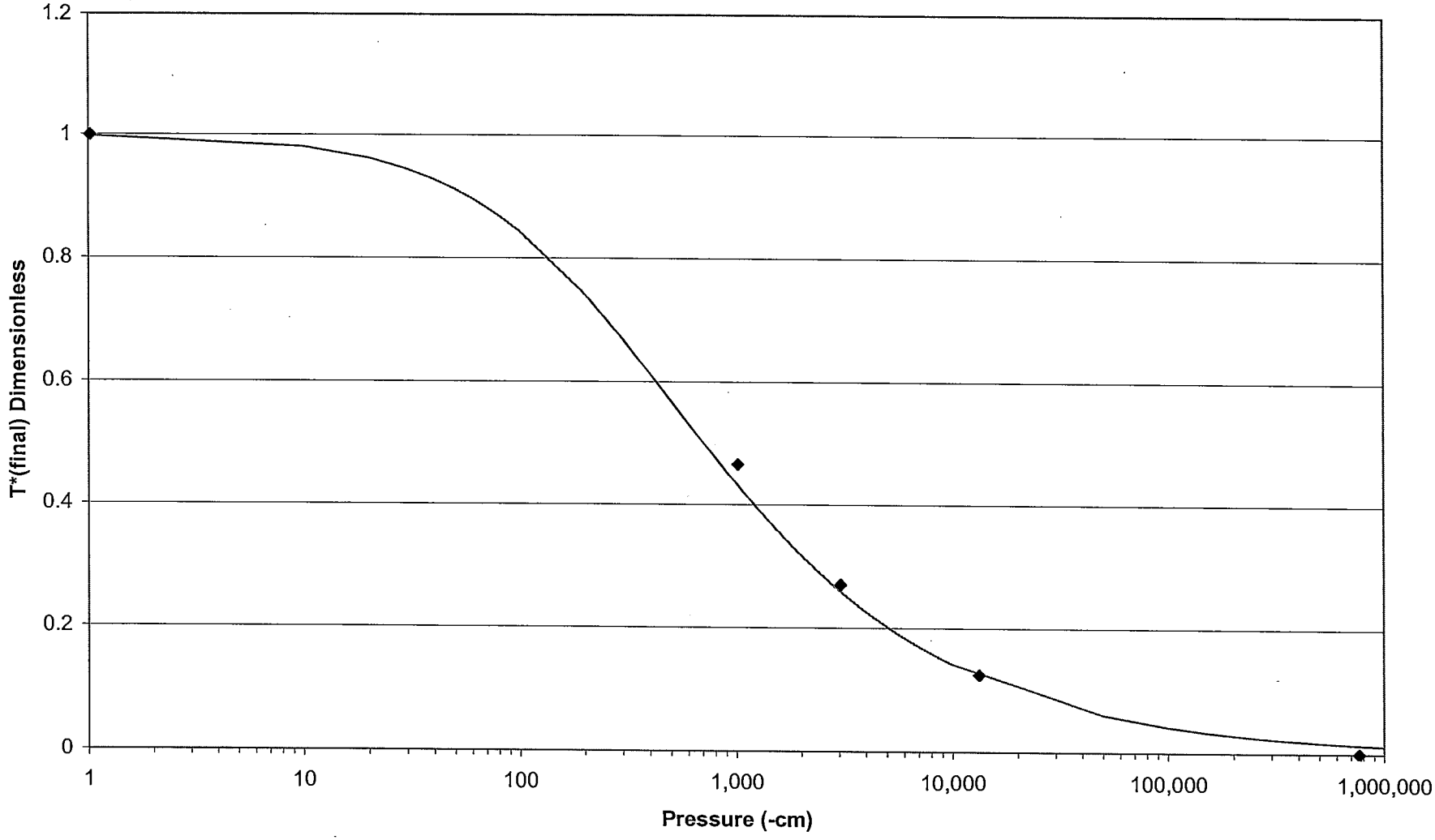
T*(final) vs Pressure

Campbell Scientific 229 Heat Dissipation Sensor SN: 10322



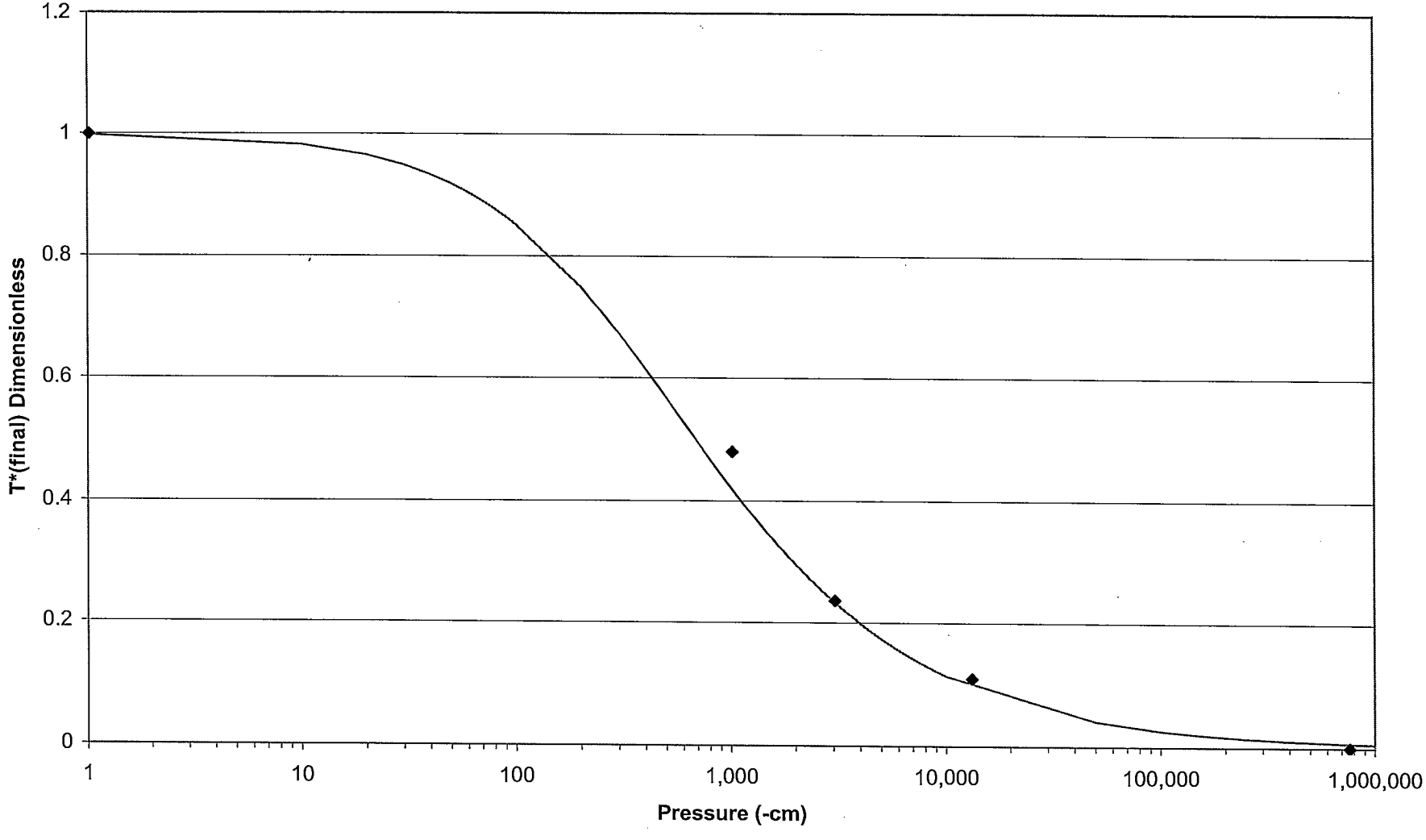
T*(final) vs Pressure

Campbell Scientific 229 Heat Dissipation Sensor SN: 10321



T*(final) vs Pressure

Campbell Scientific 229 Heat Dissipation Sensor SN: 10337



Calibration Coefficients

Sensor SN:	Alpha	N	deltaT(dry)	deltaT(wet)
10336	0.0037	1.6291	2.816	0.716
10335	0.0040	1.5868	2.816	0.806
10334	0.0046	1.5758	2.865	0.691
10330	0.0062	1.5243	2.733	0.871
10331	0.0039	1.6122	2.7	0.692
10332	0.0038	1.6514	2.808	0.691
10333	0.0041	1.6023	2.873	0.749
10345	0.0041	1.6579	2.814	0.692
10344	0.0039	1.5543	3.074	0.676
10343	0.0055	1.5311	2.573	0.7
10342	0.0045	1.5751	2.589	0.724
10310	0.0047	1.5755	2.777	0.684
10311	0.0058	1.5433	2.743	0.7
10312	0.0036	1.5897	2.695	0.683
10313	0.0039	1.5910	2.648	0.692
10314	0.0031	1.6557	2.792	0.692

Golden

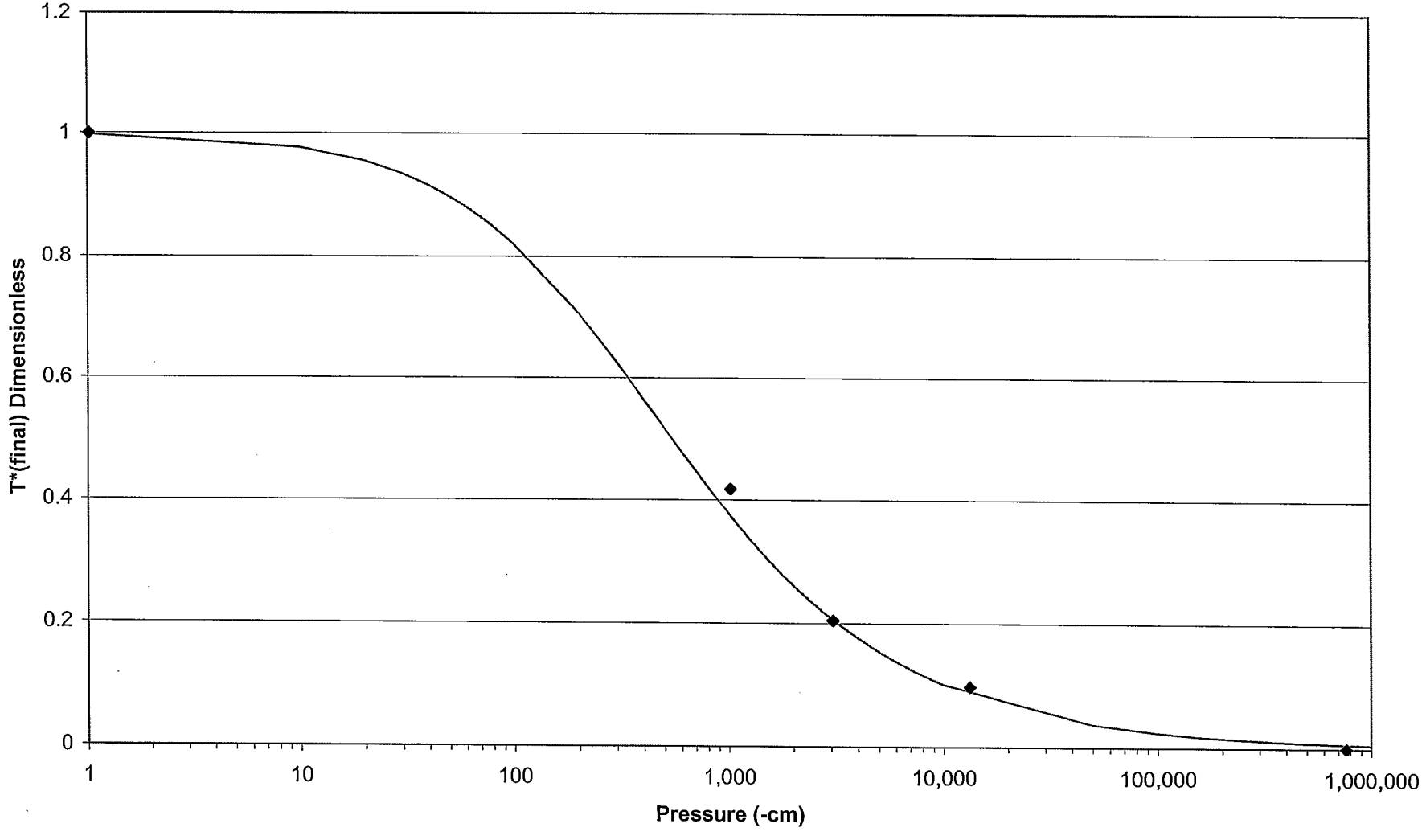
Batch 4.4

Calibration Data Points

	T* by Probe Serial Number															
Pressure (cm)	10336	10335	10334	10330	10331	10332	10333	10345	10344	10343	9646	10310	10311	10312	10313	10314
764,850	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1,020	0.418	0.422	0.400	0.376	0.414	0.401	0.408	0.381	0.445	0.391	0.404	0.394	0.375	0.443	0.425	0.449
3,059	0.205	0.228	0.213	0.203	0.211	0.186	0.207	0.177	0.261	0.219	0.218	0.208	0.204	0.240	0.231	0.217
13,257	0.098	0.100	0.100	0.112	0.097	0.094	0.099	0.086	0.108	0.109	0.100	0.100	0.103	0.104	0.098	0.100

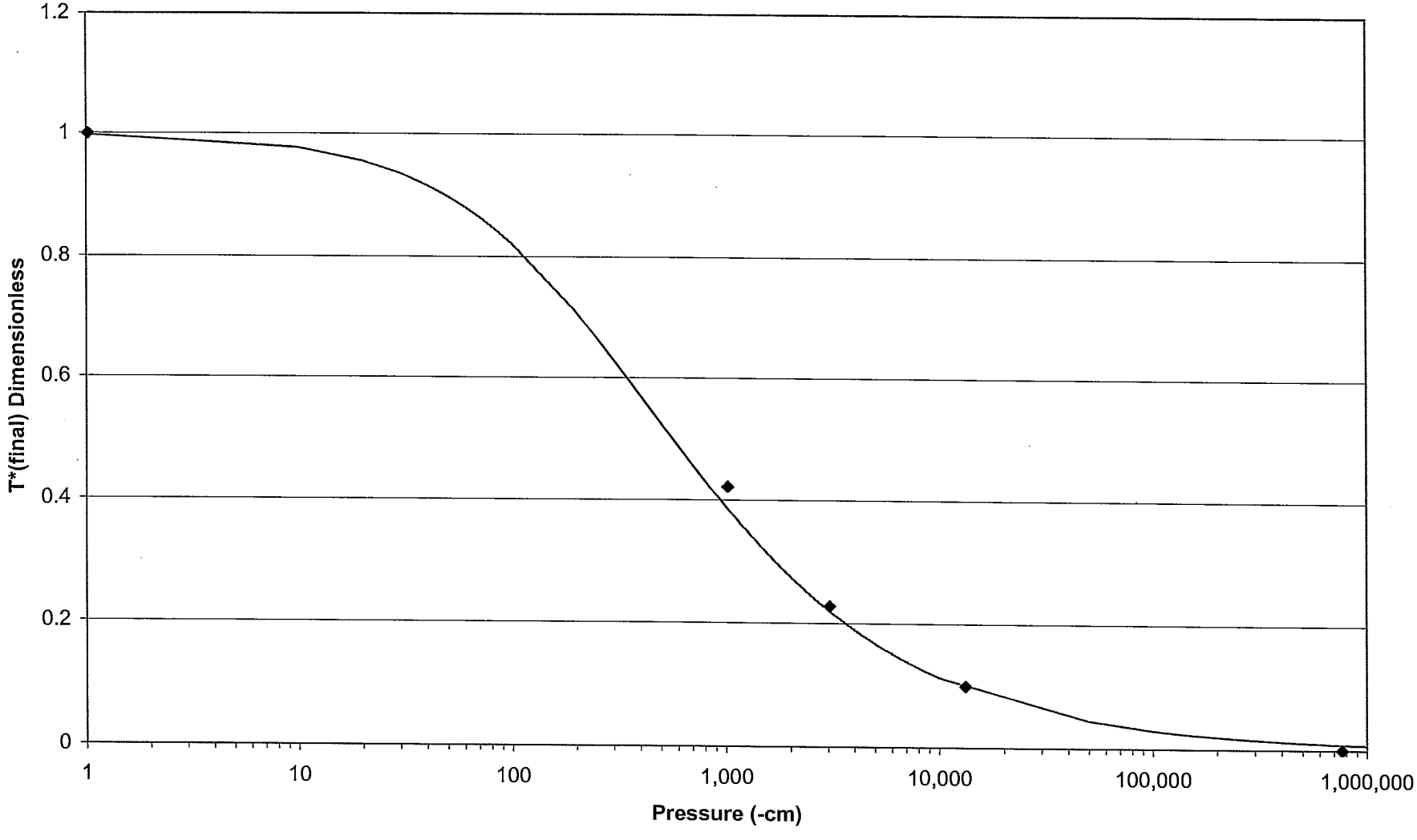
T*(final) vs Pressure

Campbell Scientific 229 Heat Dissipation Sensor SN: 10336



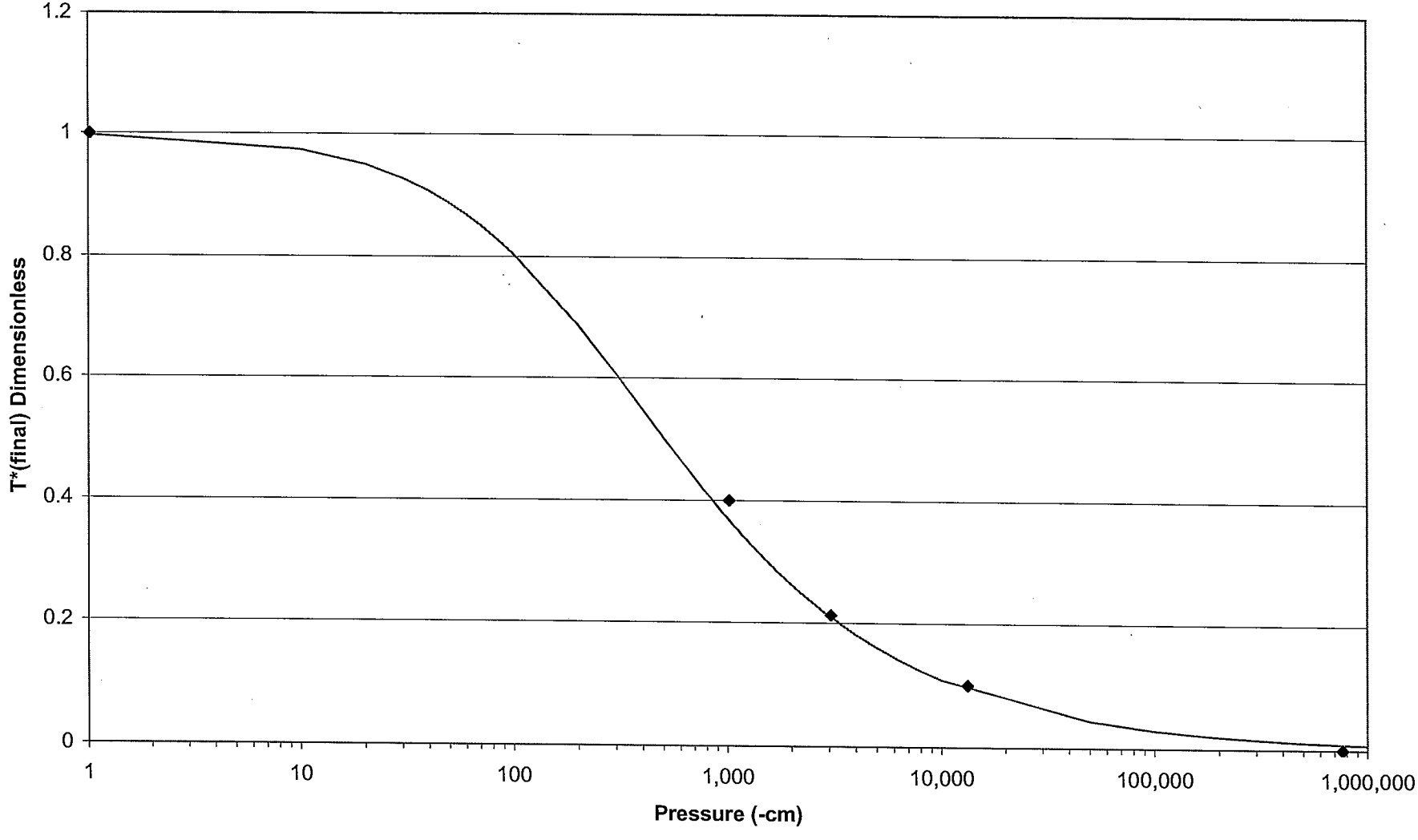
T*(final) vs Pressure

Campbell Scientific 229 Heat Dissipation Sensor SN: 10335



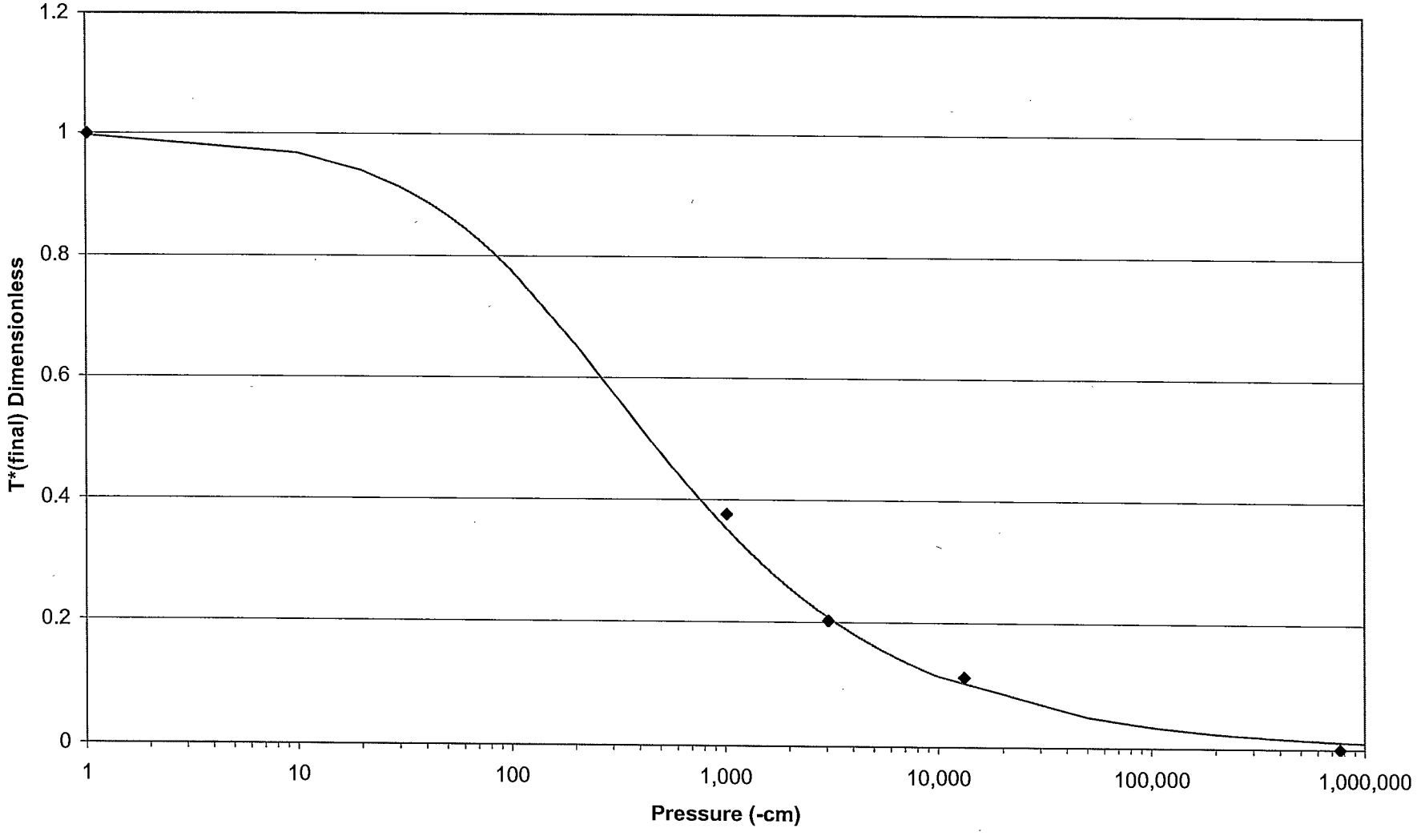
T*(final) vs Pressure

Campbell Scientific 229 Heat Dissipation Sensor SN: 10334



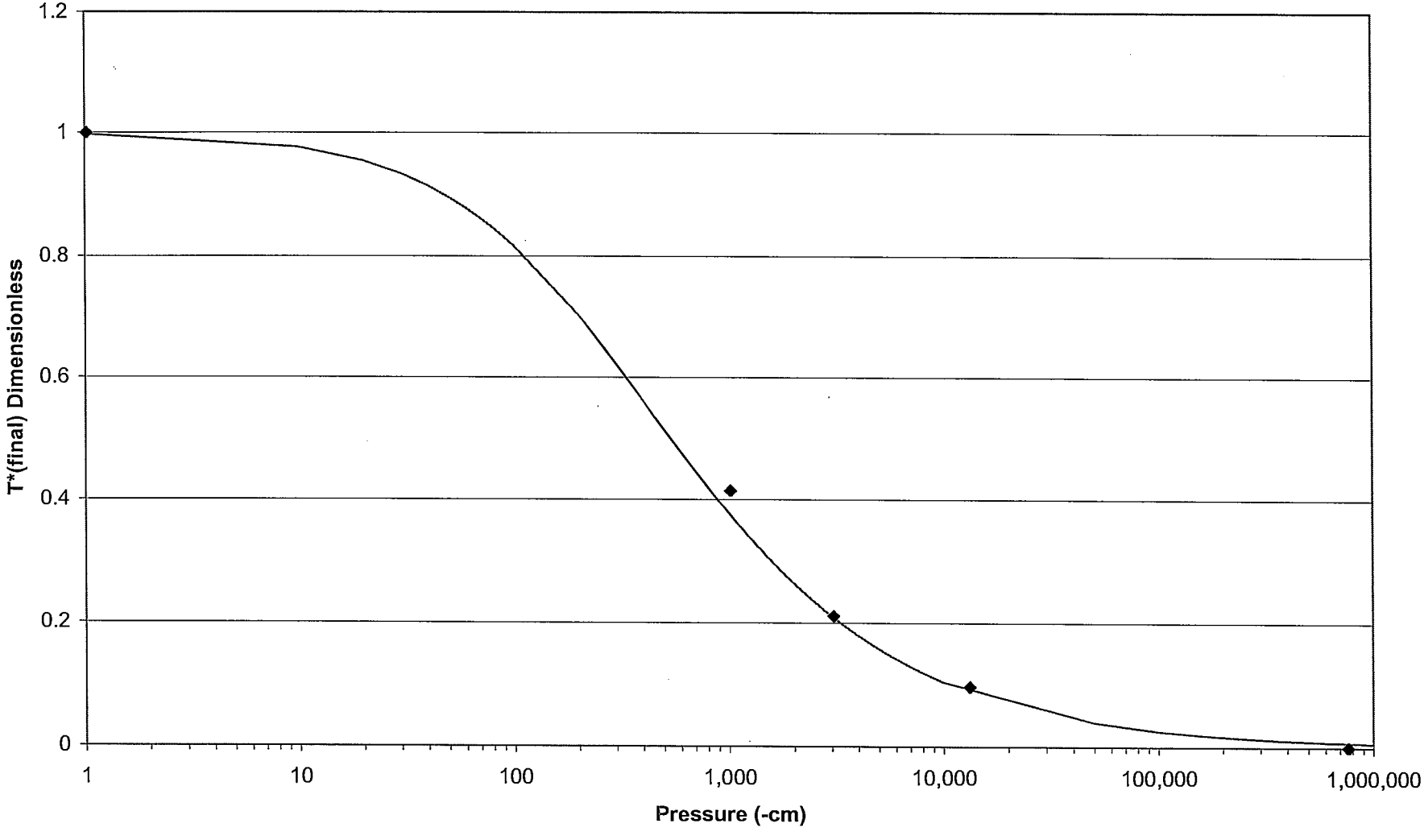
T*(final) vs Pressure

Campbell Scientific 229 Heat Dissipation Sensor SN: 10330



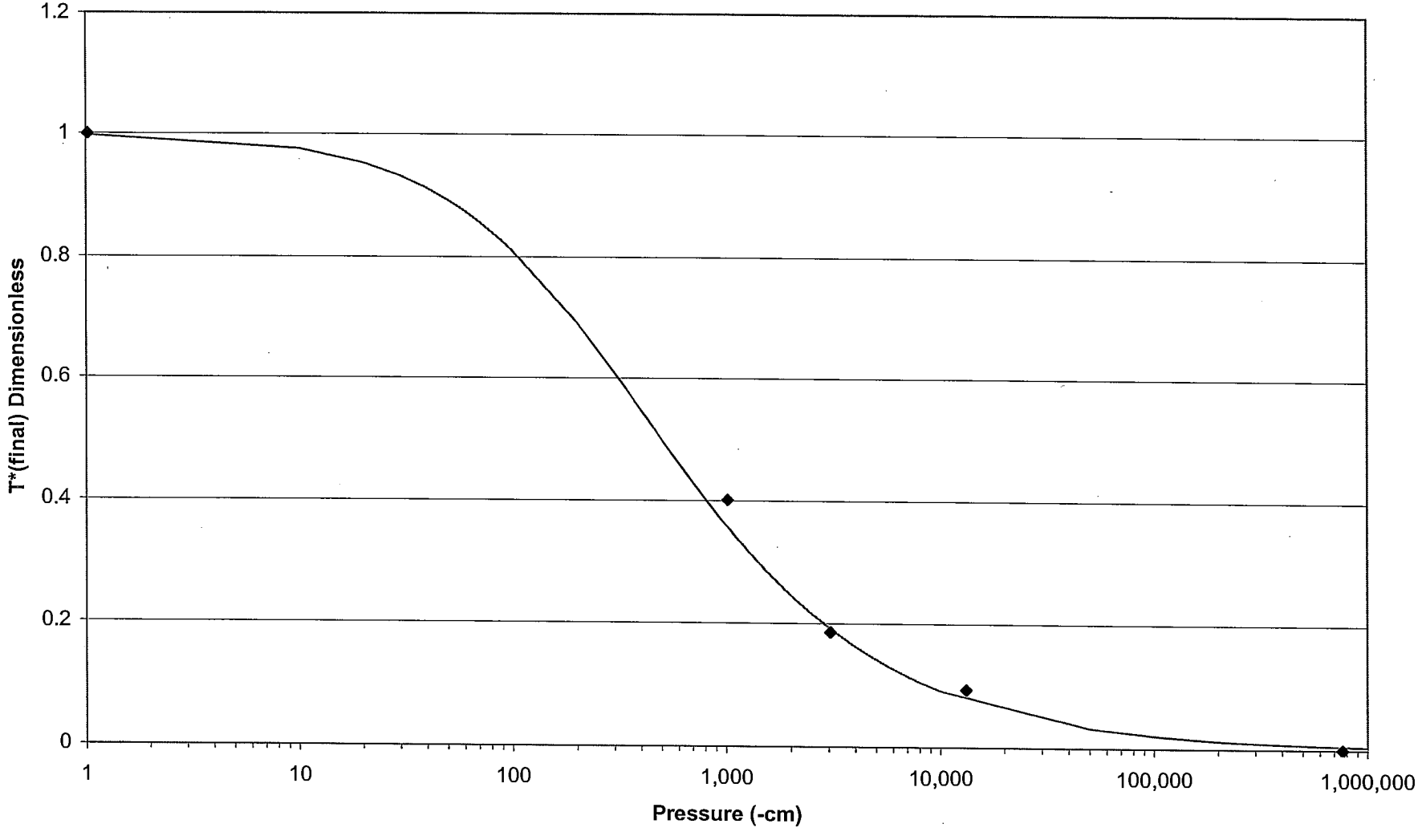
T*(final) vs Pressure

Campbell Scientific 229 Heat Dissipation Sensor SN: 10331



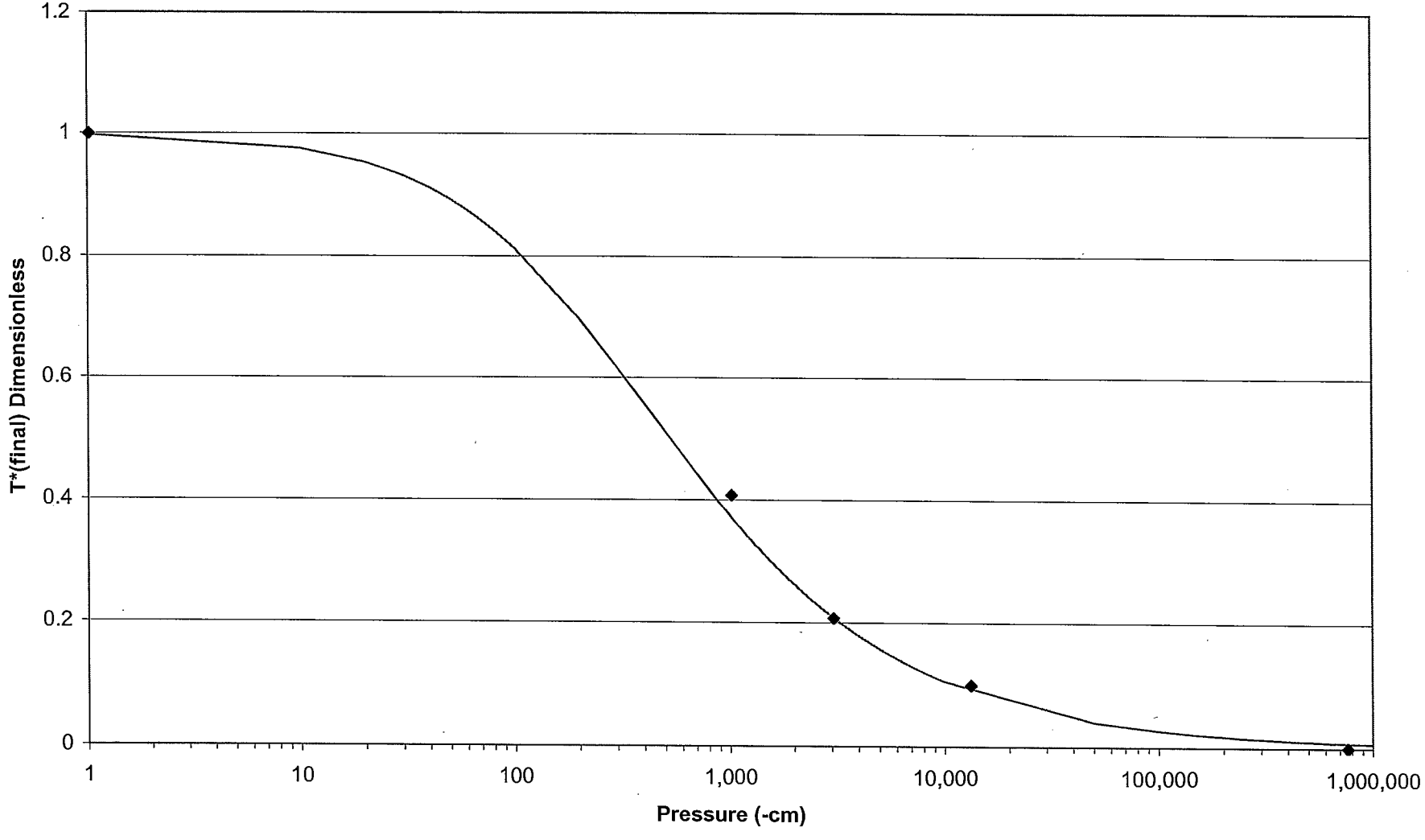
T*(final) vs Pressure

Campbell Scientific 229 Heat Dissipation Sensor SN: 10332



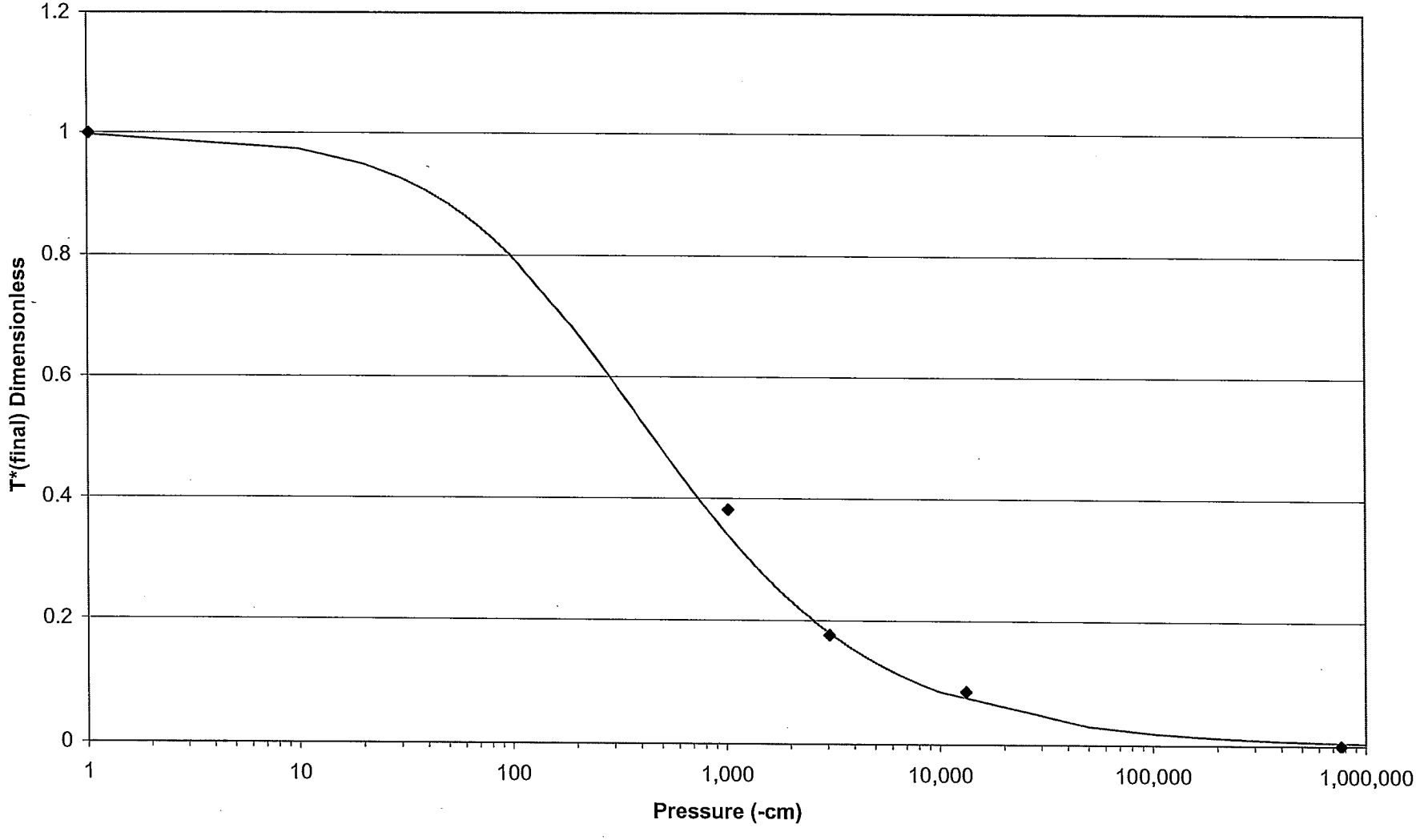
T*(final) vs Pressure

Campbell Scientific 229 Heat Dissipation Sensor SN: 10333



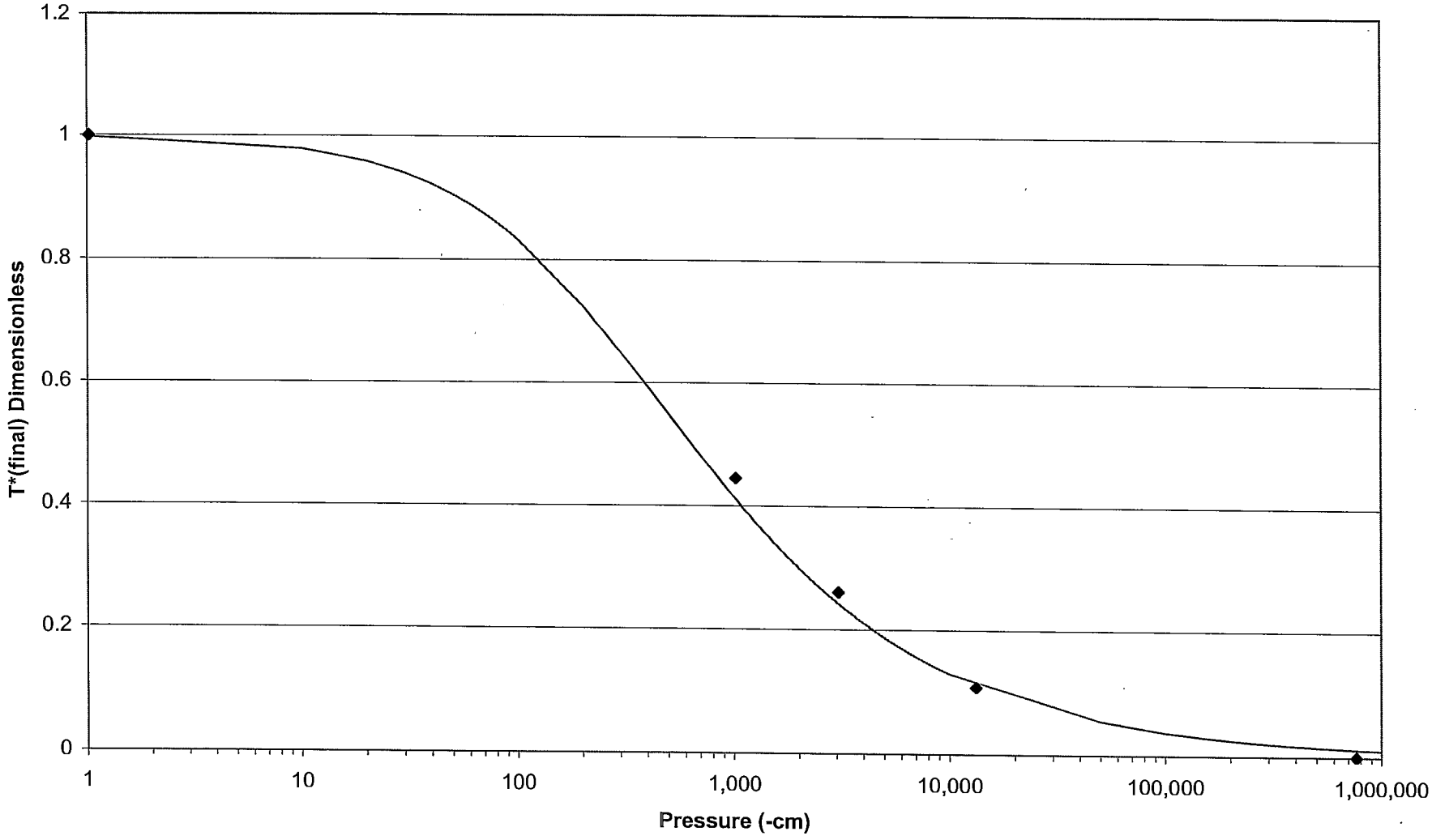
T*(final) vs Pressure

Campbell Scientific 229 Heat Dissipation Sensor SN: 10345



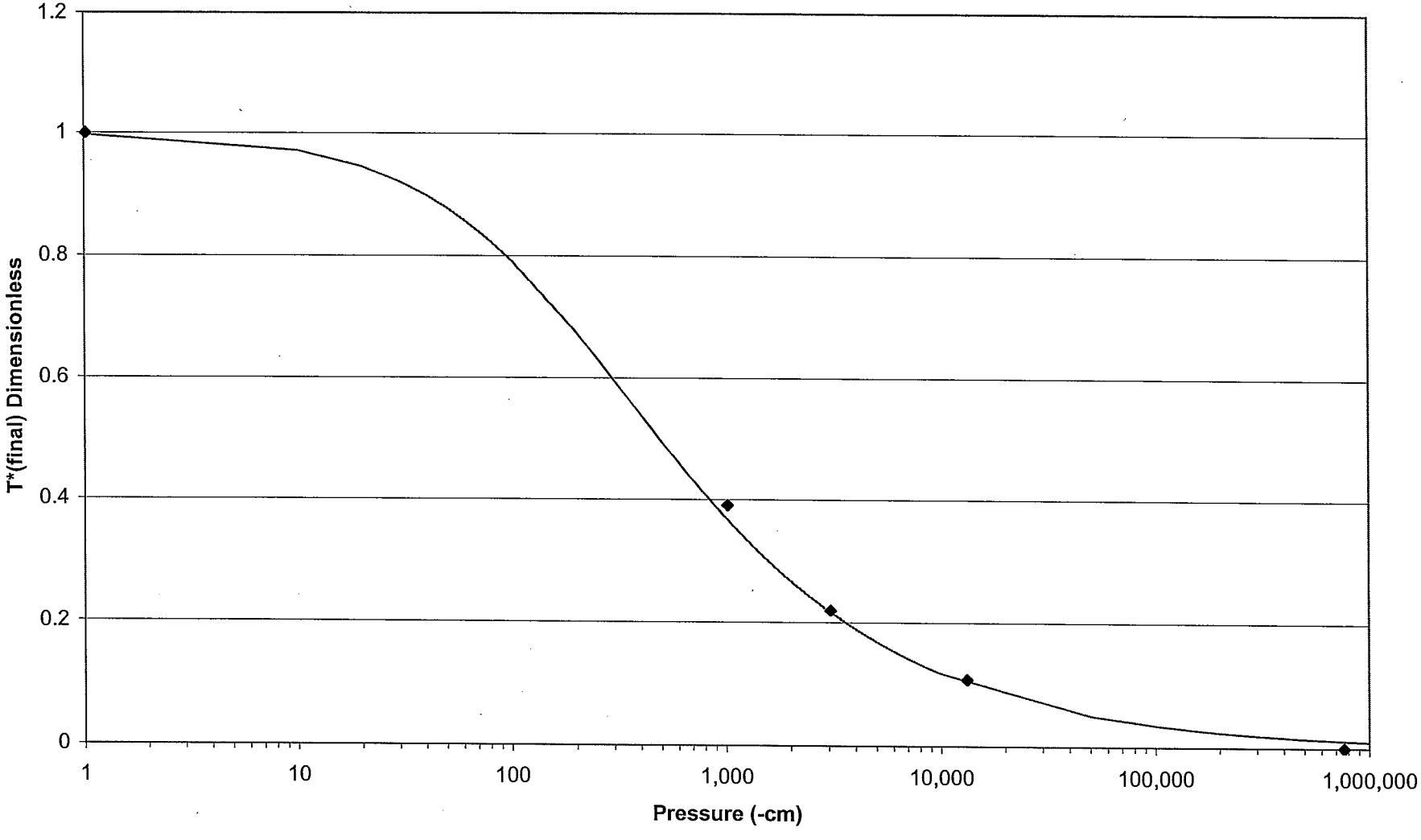
T*(final) vs Pressure

Campbell Scientific 229 Heat Dissipation Sensor SN: 10344



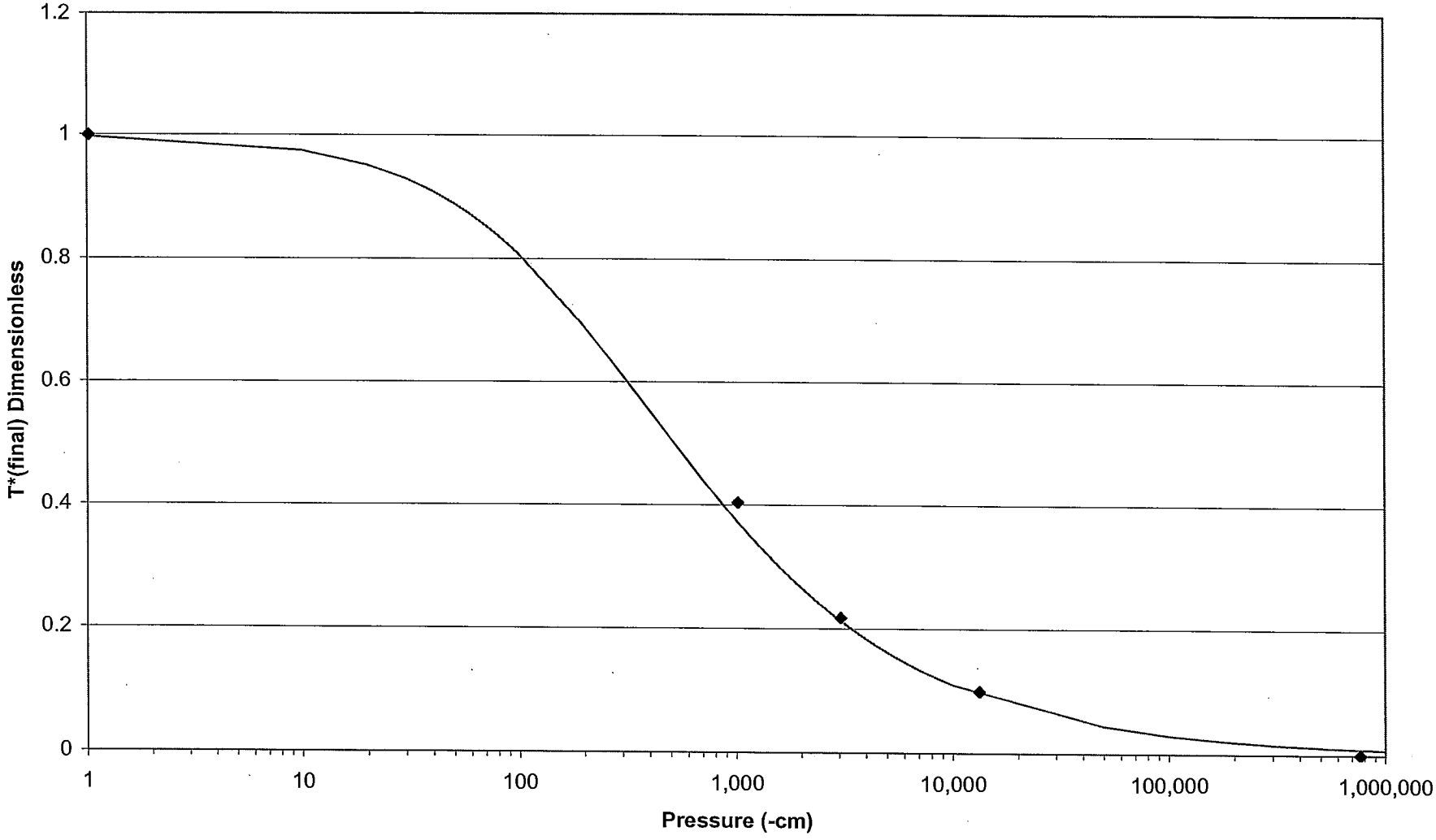
T*(final) vs Pressure

Campbell Scientific 229 Heat Dissipation Sensor SN: 10343



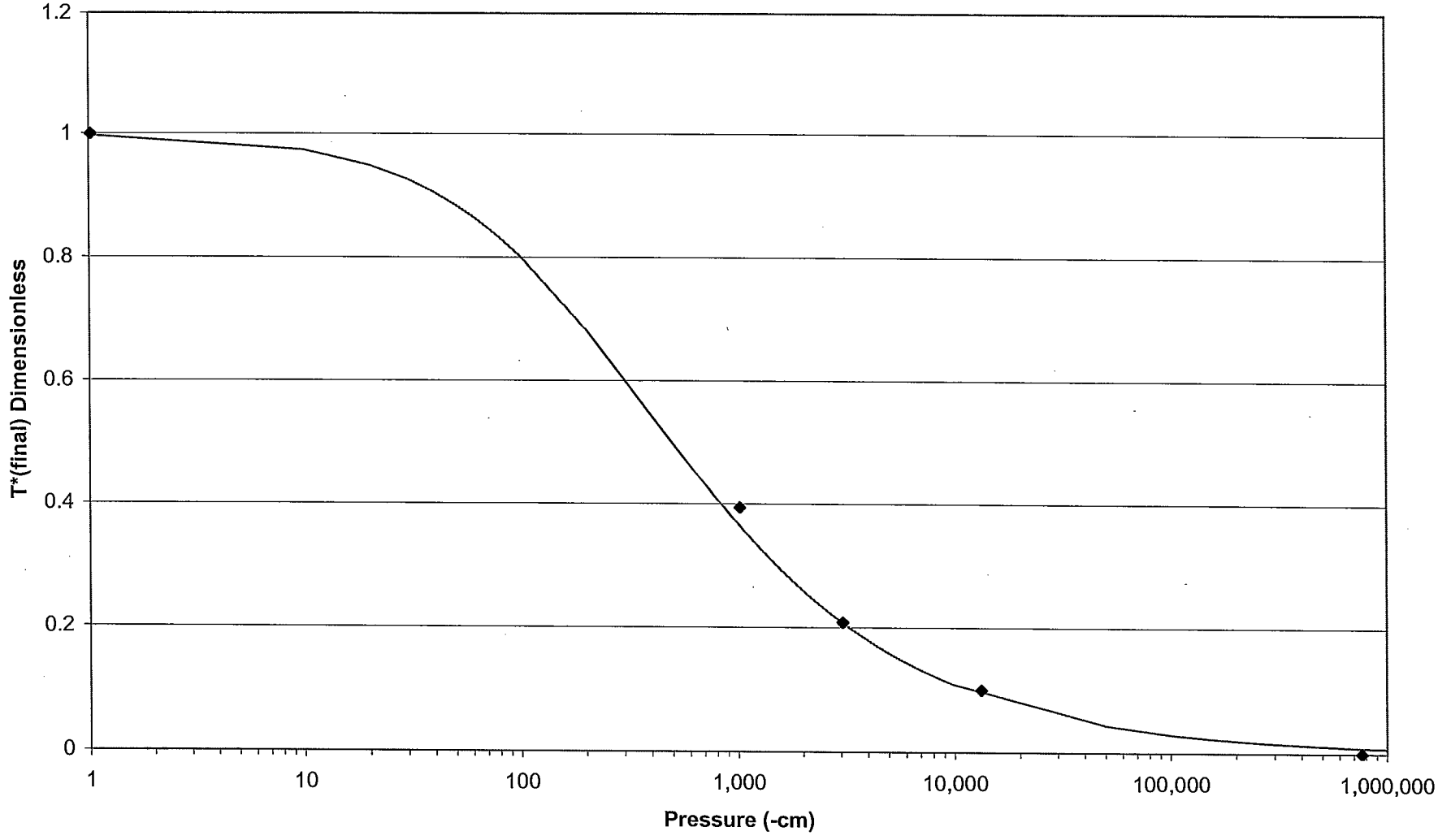
T*(final) vs Pressure

Campbell Scientific 229 Heat Dissipation Sensor SN: 10342



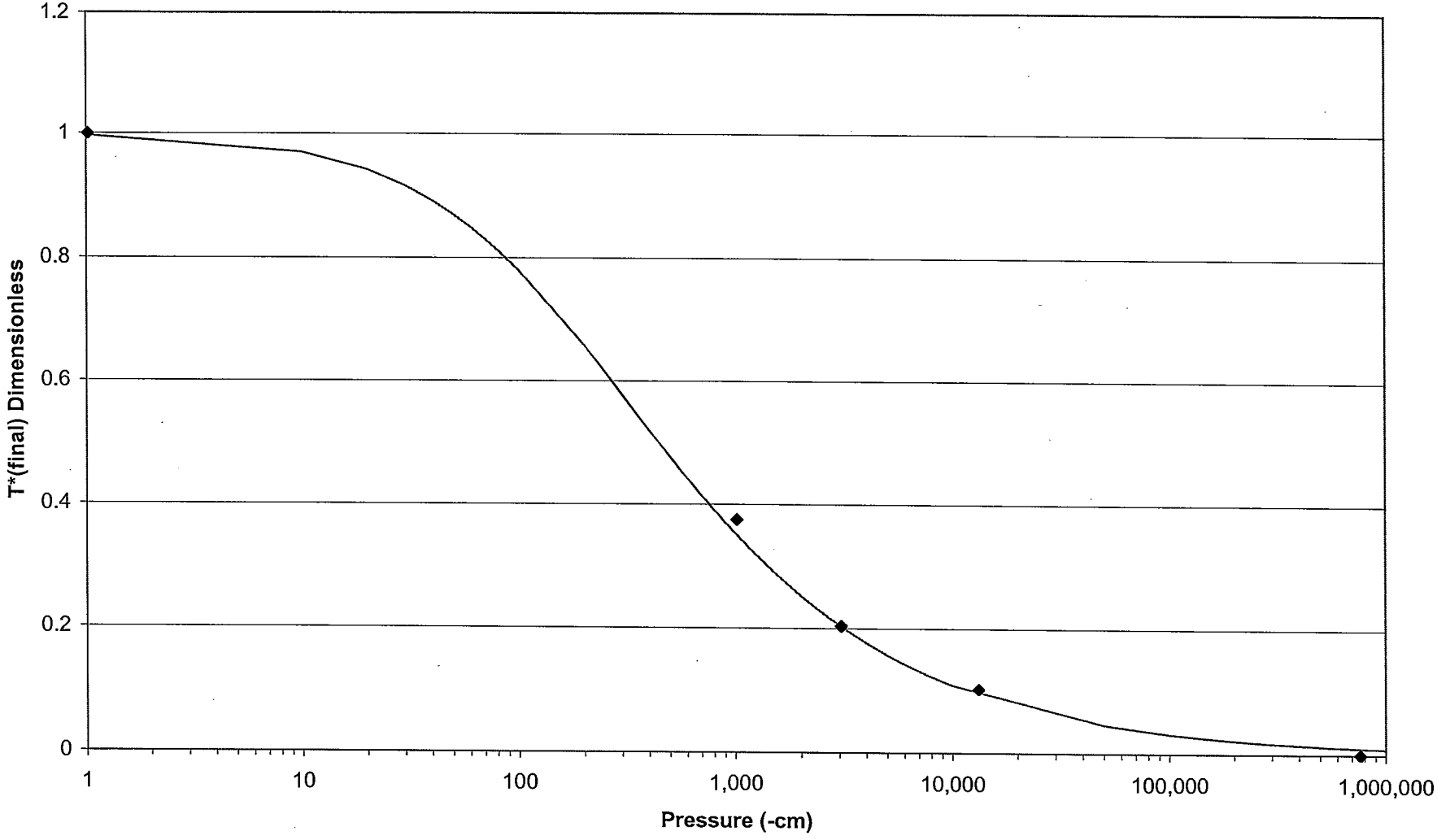
T*(final) vs Pressure

Campbell Scientific 229 Heat Dissipation Sensor SN: 10310



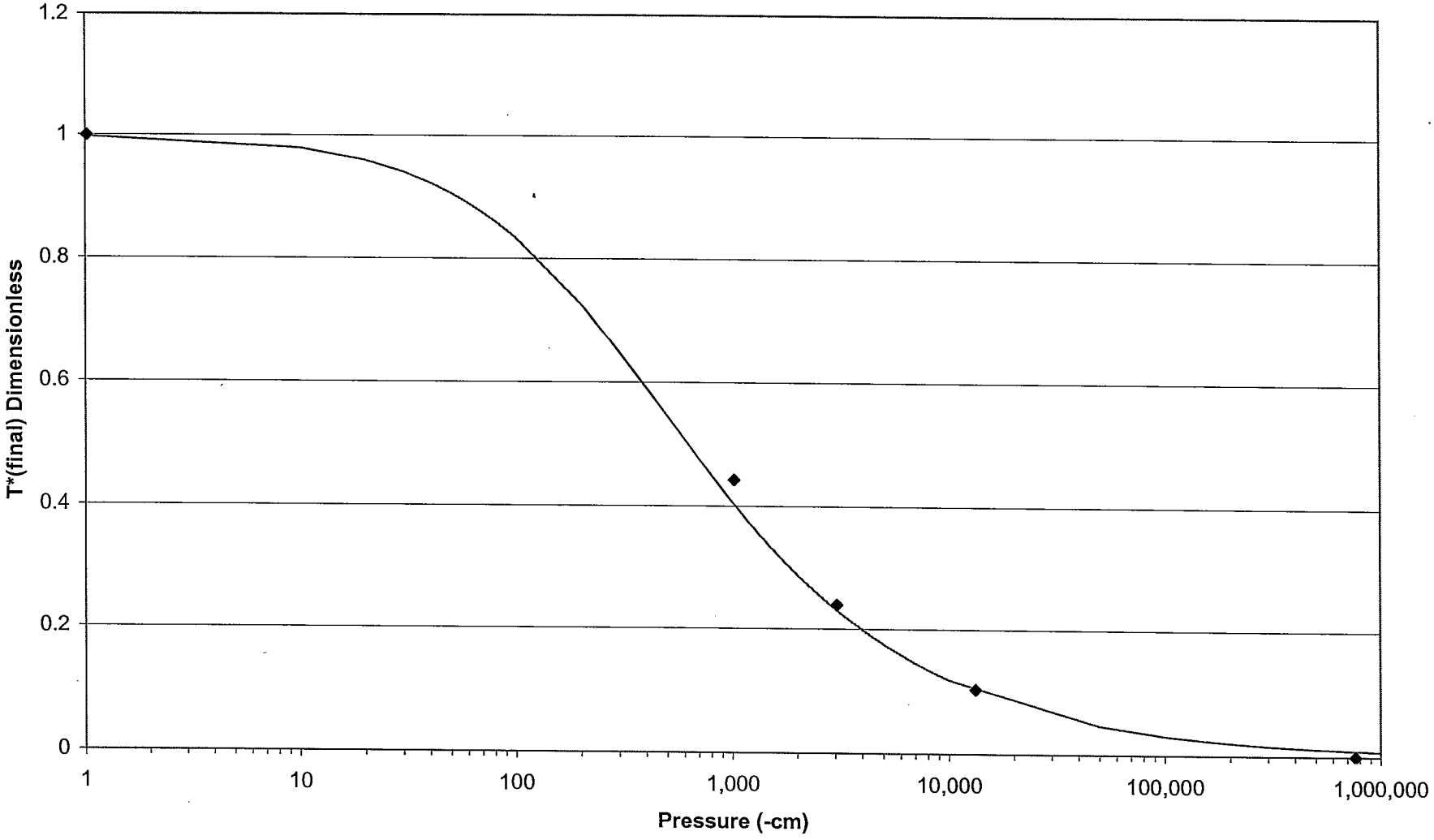
T*(final) vs Pressure

Campbell Scientific 229 Heat Dissipation Sensor SN: 10311



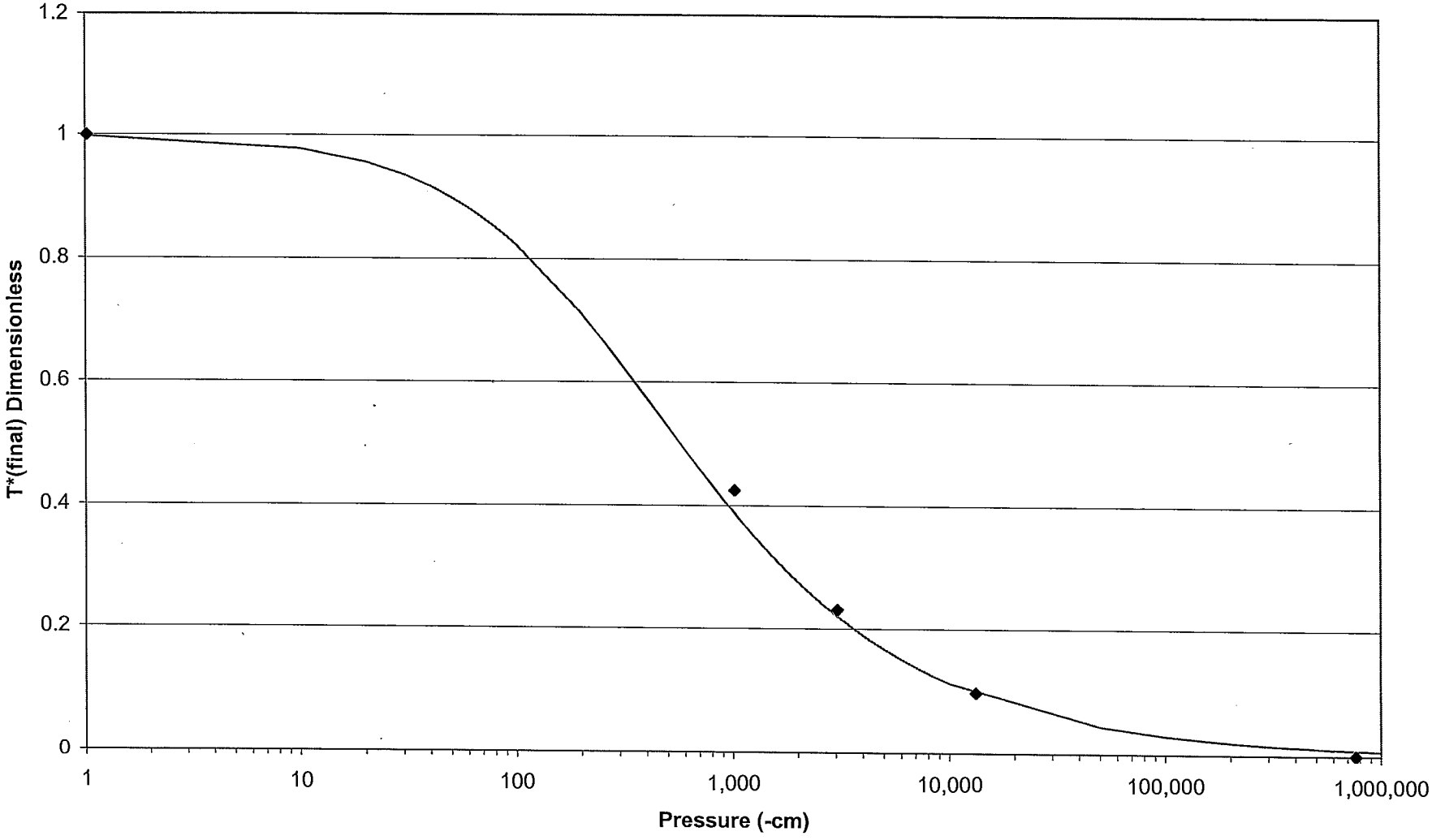
T*(final) vs Pressure

Campbell Scientific 229 Heat Dissipation Sensor SN: 10312



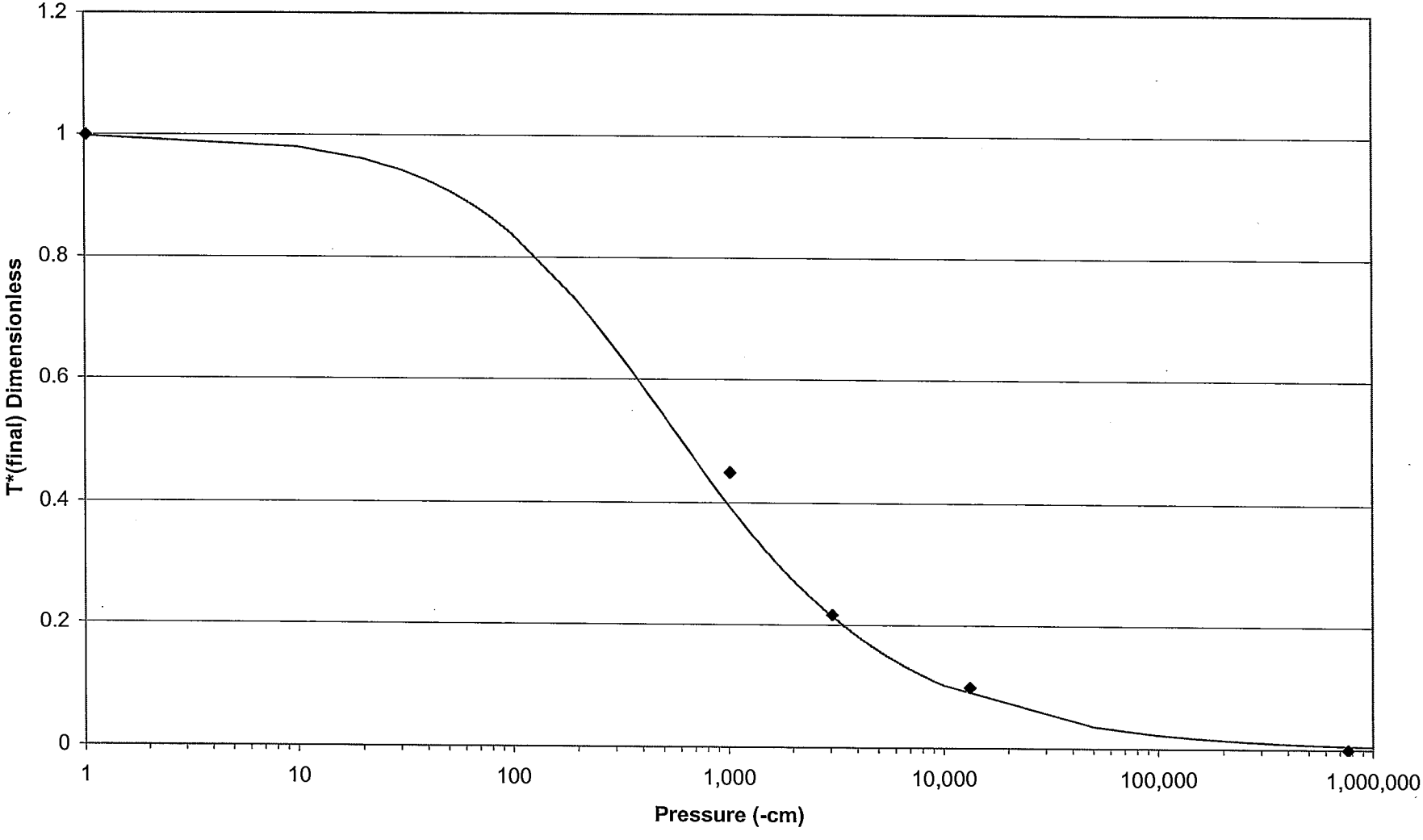
T*(final) vs Pressure

Campbell Scientific 229 Heat Dissipation Sensor SN: 10313



T*(final) vs Pressure

Campbell Scientific 229 Heat Dissipation Sensor SN: 10314



Calibration Coefficients

Sensor SN:	Alpha	N	deltaT(dry)	deltaT(wet)
10391	0.0034	1.5509	2.954	0.705
10390	0.0077	1.4549	2.676	0.713
10304	0.0137	1.3926	2.624	0.778
10301	0.0034	1.5314	2.836	0.788
10292	0.0117	1.3921	2.64	0.762
10291	0.0068	1.4778	2.942	0.738
10290	0.0036	1.5204	2.739	0.772
10289	0.0058	1.4945	2.551	0.787
10298	0.0035	1.5010	2.631	0.762
10295	0.0050	1.4812	2.518	0.73
10294	0.0037	1.5286	2.679	0.786
10293	0.0051	1.5277	2.795	0.77
10315	0.0094	1.4574	2.712	0.712
10316	0.0039	1.4783	2.878	0.812
10309	0.0118	1.4303	2.531	0.631

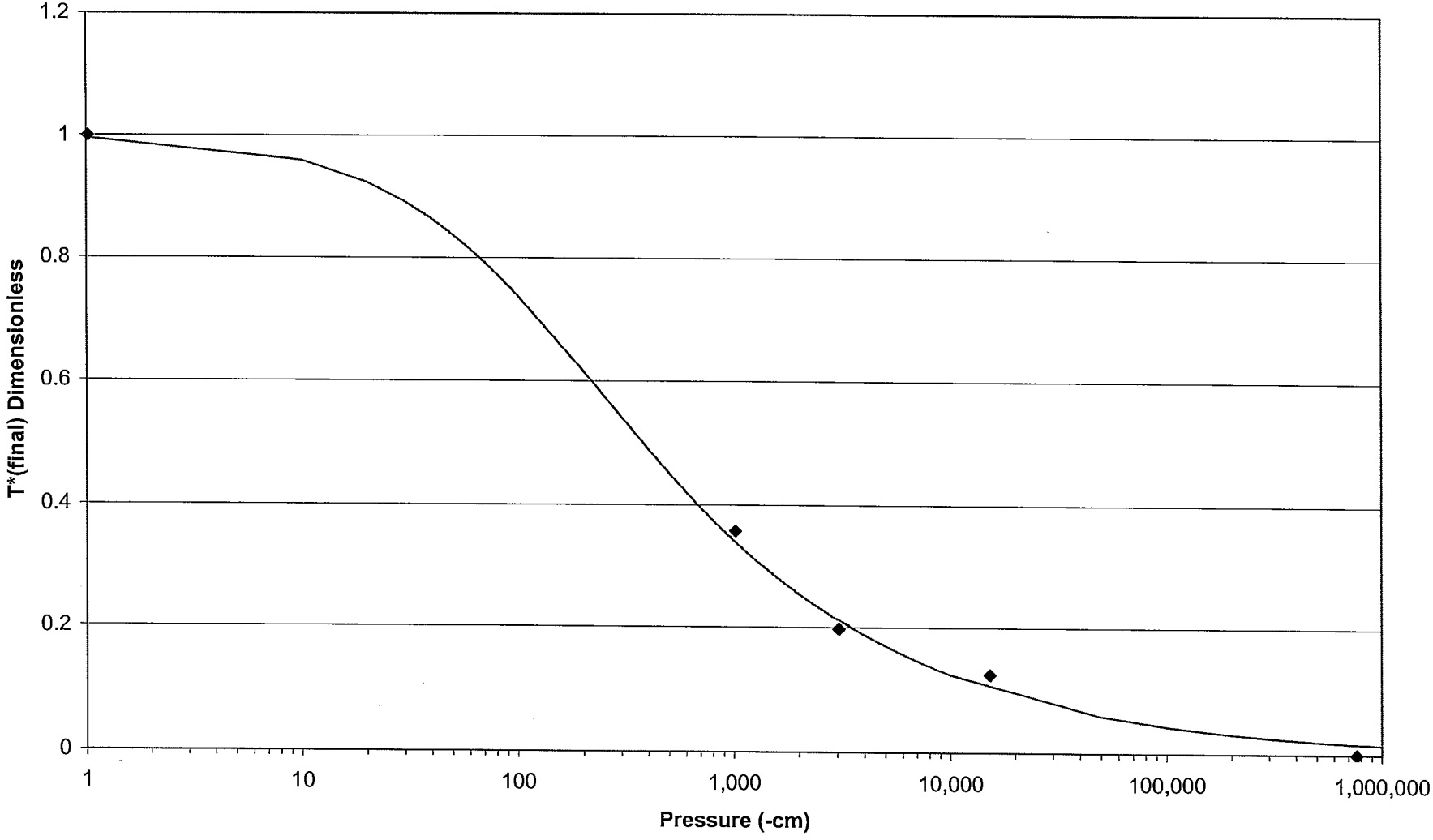
Golder
Batch 5.2

Calibration Data Points

	T* by Probe Serial Number													
Pressure (cm)	**10391**	**10390**	**10304**	**10301**	**10292**	**10291**	**10290**	**10289**	**10298**	**10295**	**9646**	**10293**	**10315**	**10316**
764,850	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1,020	0.480	0.387	0.349	0.490	0.365	0.403	0.485	0.412	0.501	0.447	0.478	0.415	0.358	0.482
3,059	0.282	0.231	0.232	0.293	0.263	0.191	0.288	0.220	0.316	0.257	0.264	0.212	0.198	0.342
15,297	0.111	0.127	0.135	0.122	0.133	0.150	0.127	0.131	0.134	0.140	0.132	0.123	0.125	0.121

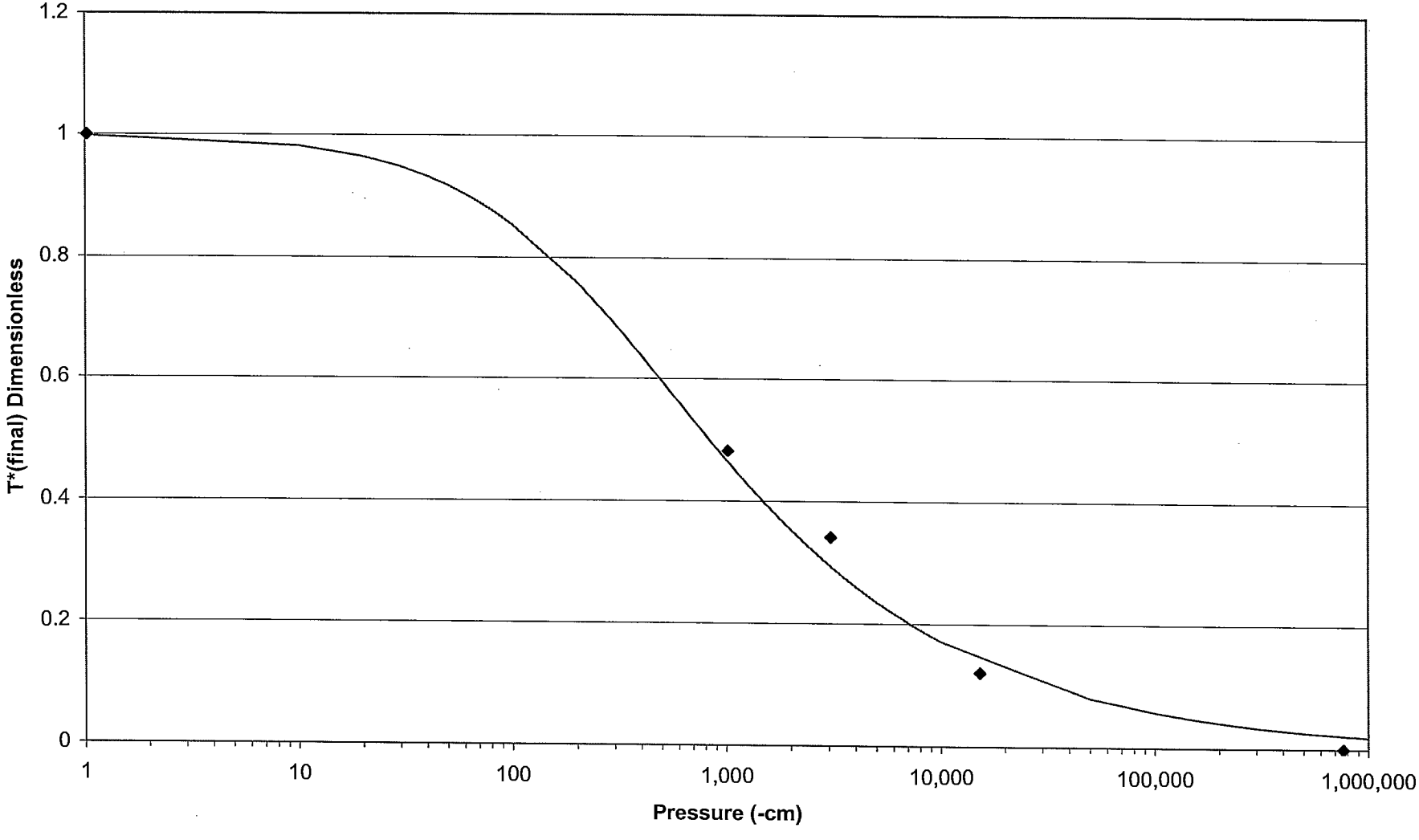
T*(final) vs Pressure

Campbell Scientific 229 Heat Dissipation Sensor SN: 10315



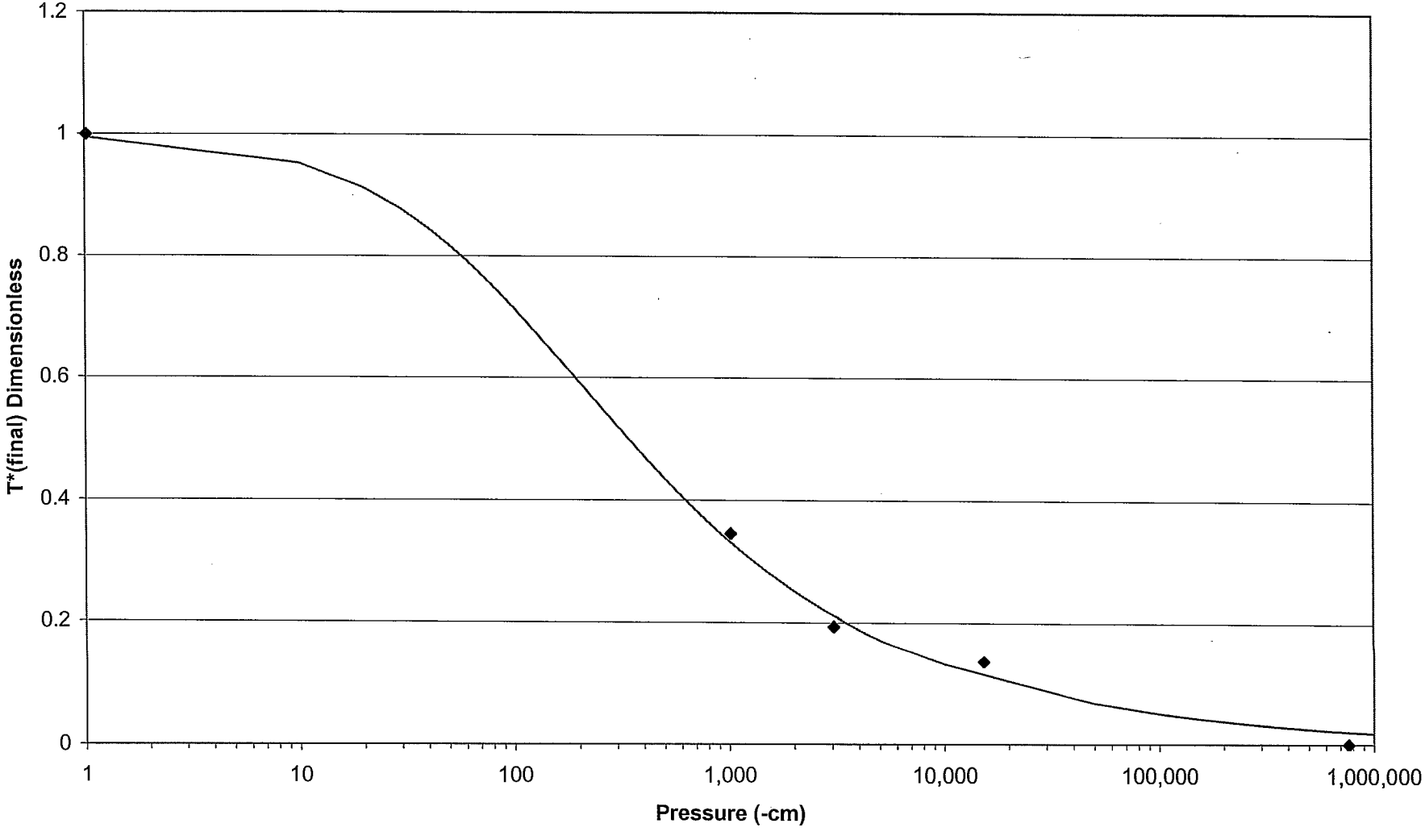
T*(final) vs Pressure

Campbell Scientific 229 Heat Dissipation Sensor SN: 10316



T*(final) vs Pressure

Campbell Scientific 229 Heat Dissipation Sensor SN: 10309



APPENDIX F

FDR CALIBRATION DATA

Tyrone No.1 Cover Material Calibration Data

Linear Relationship

Tyrone No.1 Cover Composite 30' cable Probe 1					
V	V_w	$E^{1/2}$	V_w (est)		
0.186	0	1.92584	0	Estimated V @ 0.0 V_W	
0.2	0.014	1.988	0.006682	$a_{0=e0}{}^{1/2}$	
0.5	0.155	3.32	0.149864	a1=(ew$^{1/2}$-e0$^{1/2}$)/thetaW	
0.8	0.223	4.652	0.293045		
0.89	0.336	5.0516	0.336	a1=	9.302857143
Tyrone No.1 Cover Composite 30' cable Probe 2					
V	V_w	$E^{1/2}$	V_w (est)		
0.179	0	1.89476	0	Estimated V @ 0.0 V_W	
0.2	0.014	1.988	0.010211	$a_{0=e0}{}^{1/2}$	
0.5	0.155	3.32	0.156087	a1=(ew$^{1/2}$-e0$^{1/2}$)/thetaW	
0.69	0.223	4.1636	0.248475		
0.87	0.336	4.9628	0.336	a1=	9.131071429

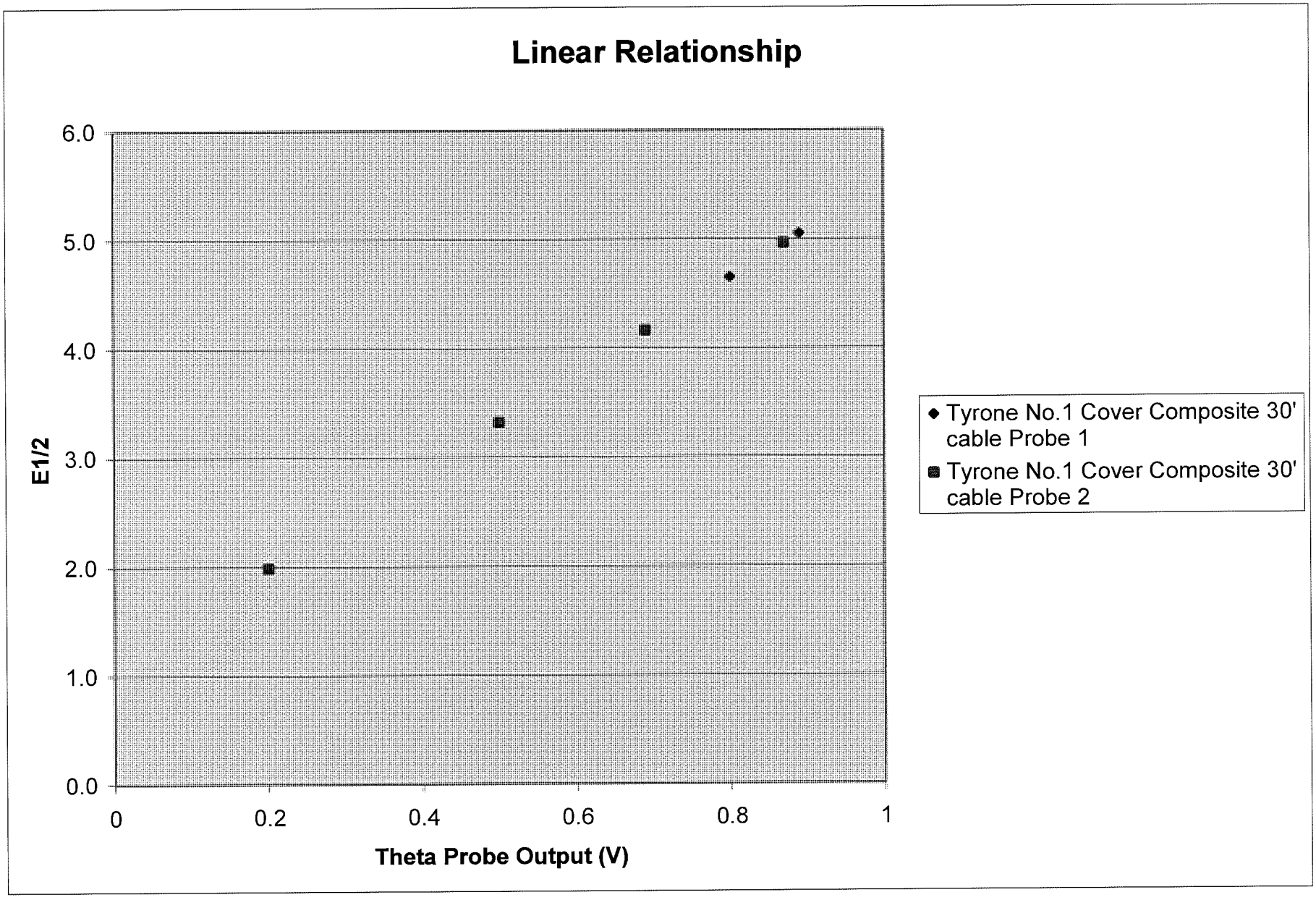
Notes:

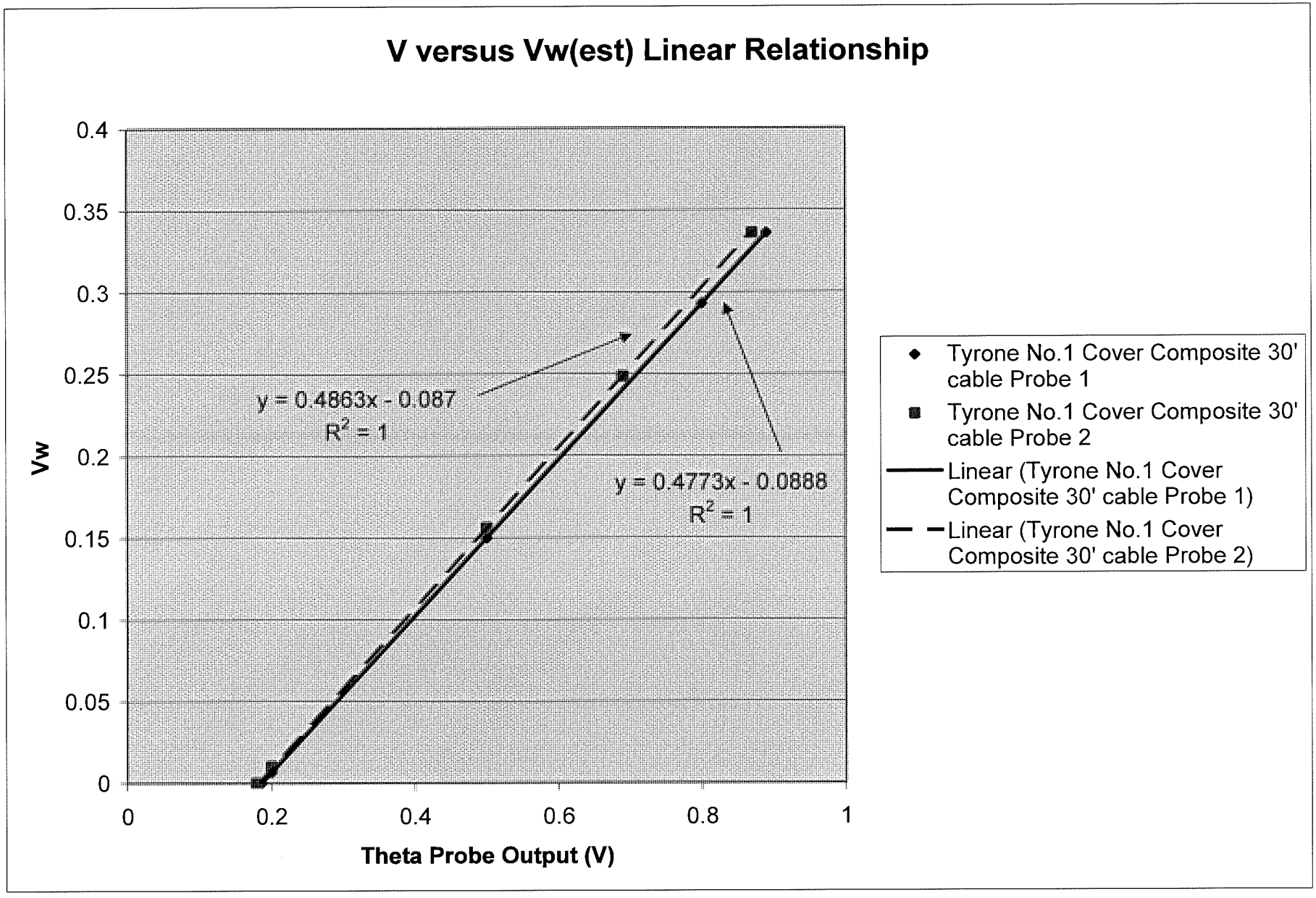
V = voltage measured with FDR sensor

V_w = volumetric moisture content of core sample measured by DBS&A Lab

E1/2 = estimated dielectric constant of tailing/cover material

V_w (est) = estimated volumetric moisture content based on FDR calibration


Linear Relationship
6.0
5.0
4.0
3.0
2.0
1.0
0.0
E1/2
0
0.2
0.4
0.6
0.8
1
Theta Probe Output (V)
Tyrone No.1 Cover Composite 30' cable Probe 1
Tyrone No.1 Cover Composite 30' cable Probe 2


V versus Vw(est) Linear Relationship
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
Vw
y = 0.4863x - 0.087
R2 = 1
y = 0.4773x - 0.0888
R2 = 1
0
0.2
0.4
0.6
0.8
1
Theta Probe Output (V)
Tyrone No.1 Cover Composite 30' cable Probe 1
Tyrone No.1 Cover Composite 30' cable Probe 2
Linear (Tyrone No.1 Cover Composite 30' cable Probe 1)
Linear (Tyrone No.1 Cover Composite 30' cable Probe 2)

Tyrone No.1 Stockpile Waste Rock Calibration Data

Linear Relationship

Tyrone No.1 Waste Rock Composite 30' cable Probe 1					
V	V_w	$E^{1/2}$	V_w (est)		
0.15	0	1.7660	0.000	Estimated V @ 0.0 V_W	
0.15	0.006	1.7660	0.000	$a_{0=e0}{}^{1/2}$	
0.54	0.181	3.4976	0.197	a1=(ew$^{1/2}$-e0$^{1/2}$)/thetaW	
0.74	0.282	4.3856	0.298		
0.88	0.369	5.0072	0.369	a1=	8.783739837
Tyrone No.1 Waste Rock Composite 30' cable Probe 2					
V	V_w	$E^{1/2}$	V_w (est)		
0.16	0	1.8104	0.000	Estimated V @ 0.0 V_W	
0.17	0.006	1.8548	0.005	$a_{0=e0}{}^{1/2}$	
0.50	0.181	3.32	0.182	a1=(ew$^{1/2}$-e0$^{1/2}$)/thetaW	
0.75	0.282	4.43	0.316		
0.85	0.369	4.874	0.369	a1=	8.302439024

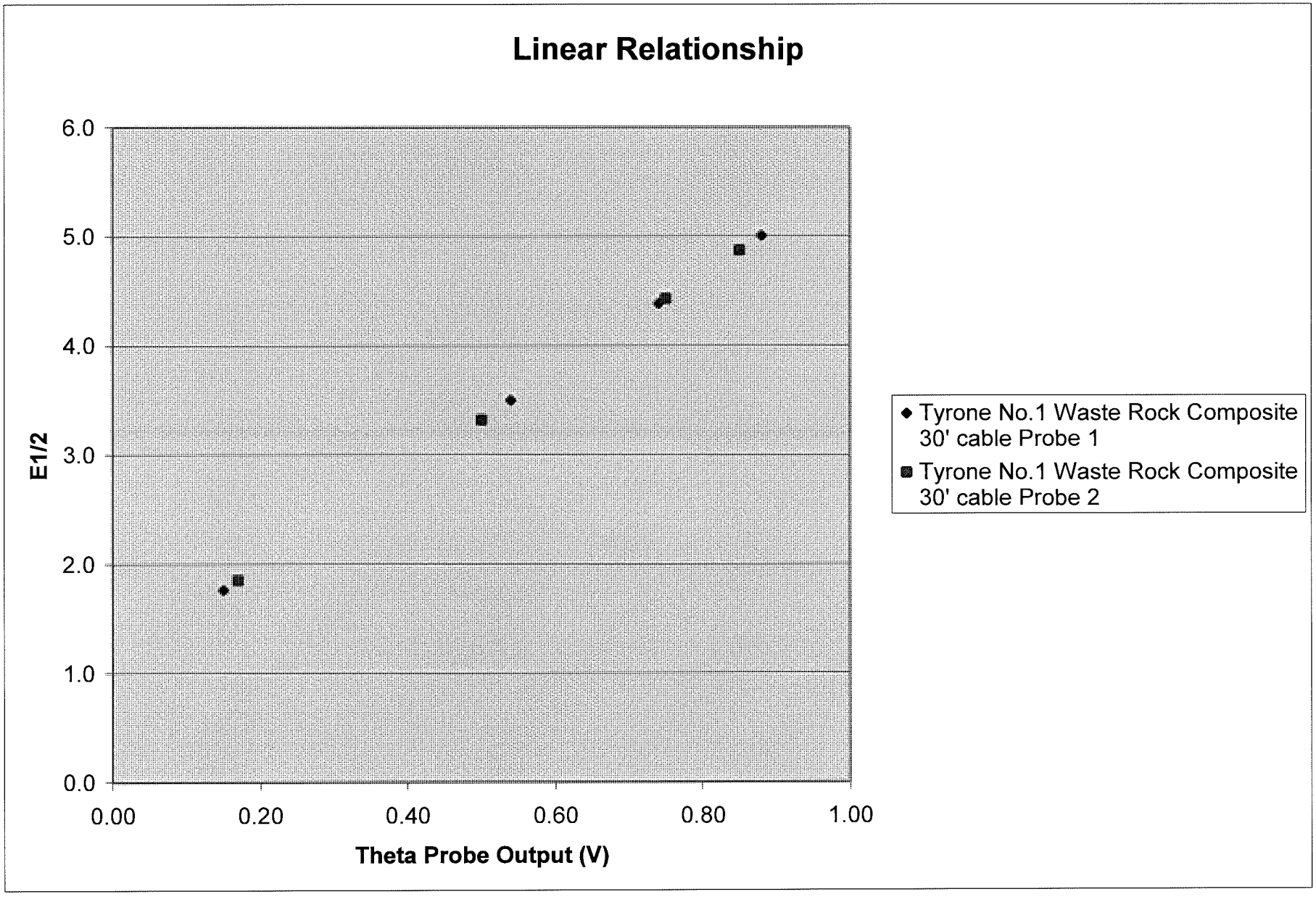
Notes:

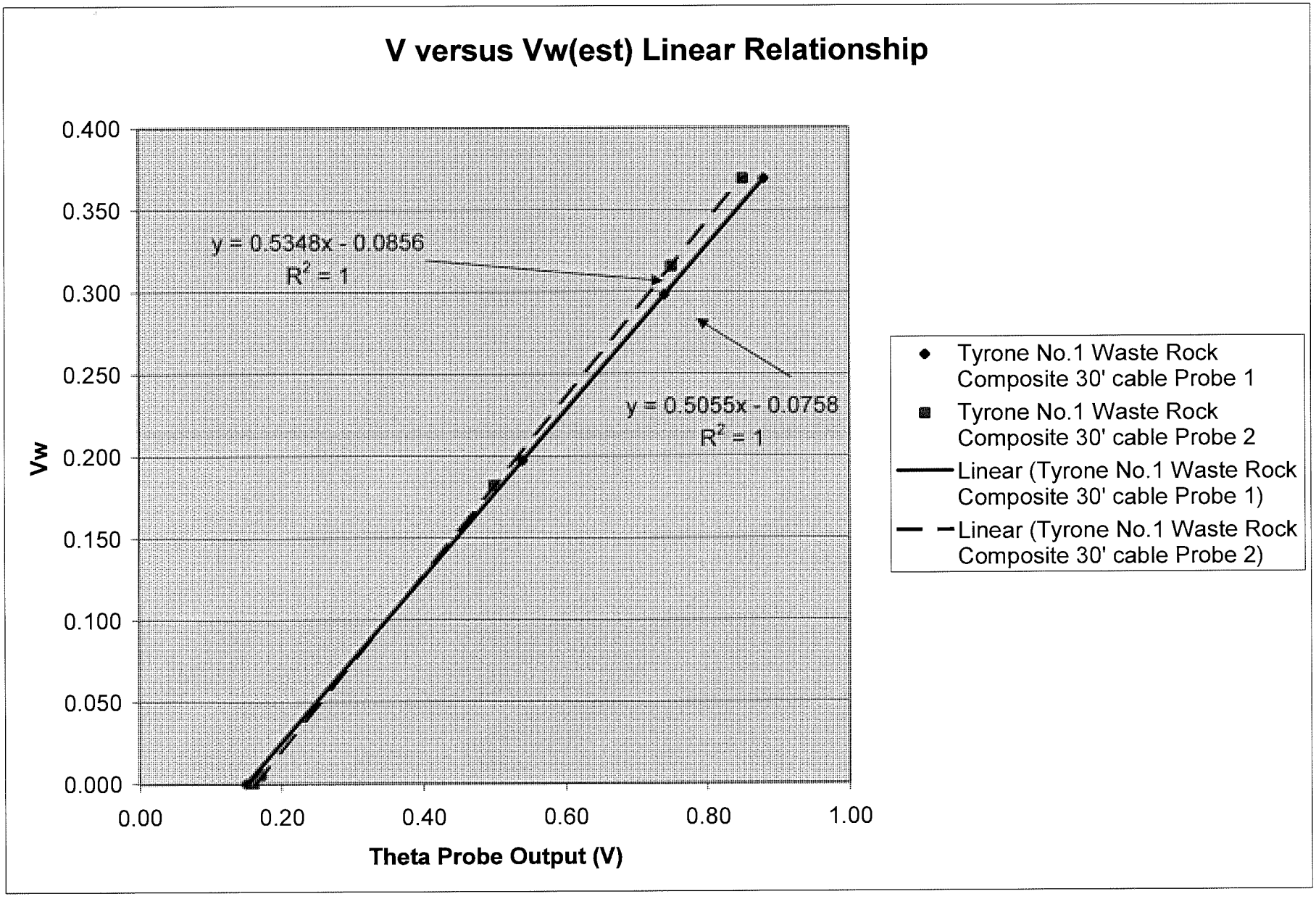
V = voltage measured with FDR sensor

V_w = volumetric moisture content of core sample measured by DBS&A Lab

E1/2 = estimated dielectric constant of tailing/cover material

V_w (est) = estimated volumetric moisture content based on FDR calibration


Linear Relationship
6.0
5.0
4.0
3.0
2.0
1.0
0.0
E1/2
0.00
0.20
0.40
0.60
0.80
1.00
Theta Probe Output (V)
Tyrone No.1 Waste Rock Composite 30' cable Probe 1
Tyrone No.1 Waste Rock Composite 30' cable Probe 2


V versus Vw(est) Linear Relationship
0.400
0.350
0.300
0.250
0.200
0.150
0.100
0.050
0.000
Vw
y = 0.5348x - 0.0856
R² = 1
y = 0.5055x - 0.0758
R² = 1
0.00
0.20
0.40
0.60
0.80
1.00
Theta Probe Output (V)
Tyrone No.1 Waste Rock Composite 30' cable Probe 1
Tyrone No.1 Waste Rock Composite 30' cable Probe 2
Linear (Tyrone No.1 Waste Rock Composite 30' cable Probe 1)
Linear (Tyrone No.1 Waste Rock Composite 30' cable Probe 2)

APPENDIX G

SOIL DENSITY MEASUREMENTS

SUMMIT TECHNICAL, INC.

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MOISTURE DENSITY RELATIONSHIP OF SOILS

Customer: Golder Associates, Inc.
Date Tested: May, 13 2005
Project Name: Tyrone Lysimeter Installation

Project No.:

Location: **Site 3A, Tailings Stockpile #1**

Test Type: Sieve Analysis/Moisture Density Relationship

Procedure: ASTM C-117, ASTM C-136, & ASTM D-1557 A
Soil Type: Tailings-Silty sandy, gravel (waste)
Yellowish/brown

Sieve Size	Total Sample % Passing	Spec's. % Passing
1"	0	
3/4"	90	
1/2"	81	
3/8"	76	
No. 4	65	
No. 8	55	
No. 16	46	
No. 30	38	
No. 50	32	
No. 100	30	
No. 200	21.6	
DUST RATIO	0.03	± <0.30 %

Maximum Dry Density: 134.4 lbs./cu. ft.
Optimum Moisture: 6.0%

% Material Field Moisture: 4.6%

ASTM C-117: 20.7%

Fractured Faces		
Liquid Limit		
Plasticity Index		
Soils Classification		
Estimated R-Value		

This report was prepared by: _____
Lab Manager

SUMMIT TECHNICAL, INC.

For all your construction and engineering technical services

P.O. Box 475
Bayard, NM 88023

505-537-3466
505-537-3774 fax

FIELD RESULTS FOR SOIL DENSITIES

Date: May 11, 2005
Customer: Golder Associates, Inc.
Project: Tyrone Lysimeter Installation
Tailings Stockpile #1
Project No.: 013-1595

Proctor
Bench Areas

Test No. 1
Wet Density 91.9
Moisture 11.2
Dry Density 80.7
% Moisture 13.9
% Compaction:
Location: 2' Below Top of Lysimeter (Site 3A)
Backfill

Test No. 2
Wet Density 99.7
Moisture 10.0
Dry Density 89.7
% Moisture 11.2
% Compaction:
Location: 2' Below Top of Lysimeter (Site 3A)
Backfill

Test No. 3
Wet Density 90.8
Moisture 8.7
Dry Density 82.1
% Moisture 10.5
% Compaction:
Location: 2' Below Top of Lysimeter (Site 3A)
Backfill

Test No. 4
Wet Density 97.6
Moisture 9.4
Dry Density 88.1
% Moisture 10.7
% Compaction:
Location: Top of Lysimeter (Site 3A)
Backfill

Test No. 5
Wet Density 92.0
Moisture 8.7
Dry Density 83.3
% Moisture 10.4
% Compaction:
Location: Top of Lysimeter (Site 3A)
Backfill

Test No. 6
Wet Density 98.9
Moisture 7.6
Dry Density 91.4
% Moisture 8.3
% Compaction: Top of Lysimeter (Site 3A)
Location: **Backfill**

Test No. 7
Wet Density 103.4
Moisture 9.6
Dry Density 93.8
% Moisture 10.2
% Compaction:
Location: 2' Above Lysimeter (Site 3A)
Backfill

Test No. 8
Wet Density 98.5
Moisture 6.0
Dry Density 92.5
% Moisture 6.4
% Compaction:
Location: 2' Above Lysimeter (Site 3A)
Backfill

This report was prepared by:

Lab Manager

SUMMIT TECHNICAL, INC.

For all your construction and engineering technical services

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Bayard, NM 88023

505-537-3466
505-537-3774 fax

FIELD RESULTS FOR SOIL DENSITIES

Date: May 11, 2005
Customer: Golder Associates, Inc.
Project: Tyrone Lysimeter Installation
Tailings Stockpile #1
Project No.: 013-1595

Proctor
Bench Areas

Test No. 9
Wet Density 91.5
Moisture 8.2
Dry Density 83.3
% Moisture 9.9
% Compaction:
Location: 2' Above Lysimeter (Site 3A)
Backfill

Test No. 10
Wet Density 102.5
Moisture 8.7
Dry Density 93.9
% Moisture 9.2
% Compaction:
Location: Existing Grade (Site 3A)
Backfill

Test No. 11
Wet Density 108.4
Moisture 9.7
Dry Density 98.7
% Moisture 9.8
% Compaction:
Location: Existing Grade (Site 3A)
Backfill

Test No. 12
Wet Density 99.6
Moisture 7.4
Dry Density 92.2
% Moisture 8
% Compaction:
Location: Existing Grade (Site 3A)
Backfill

Test No. 13
Wet Density
Moisture
Dry Density
% Moisture
% Compaction:
Location:

Test No. 14
Wet Density
Moisture
Dry Density
% Moisture
% Compaction:
Location:

Test No. 15
Wet Density
Moisture
Dry Density
% Moisture
% Compaction:
Location:

Test No. 16
Wet Density
Moisture
Dry Density
% Moisture
% Compaction:
Location:

This report was prepared by:

Lab Manager

SUMMIT TECHNICAL, INC.

For all your construction and engineering technical services

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Bayard, NM 88023

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505-537-3774 fax

FIELD RESULTS FOR SOIL DENSITIES

Date: May 10, 2005
Customer: Golder Associates, Inc.
Project: Tyrone Lysimeter Installation
Tailings Stockpile #1
Project No.: 013-1595

Proctor
Bench Areas

Test No. 1	
Wet Density	108.4
Moisture	6.6
Dry Density	101.8
% Moisture	6.5
% Compaction:	
Location:	Top of Surface (Site 3 A)
	(Excavation)

Test No. 2	
Wet Density	93.1
Moisture	6.6
Dry Density	86.5
% Moisture	7.6
% Compaction:	
Location:	Top of Surface (Site 3 A)
	(Excavation)

Test No. 3	
Wet Density	98.3
Moisture	4.9
Dry Density	93.5
% Moisture	5.2
% Compaction:	
Location:	Top of Surface (Site 3 A)
	(Excavation)

Test No. 4	
Wet Density	88.1
Moisture	9.1
Dry Density	79.0
% Moisture	11.5
% Compaction:	
Location:	2' BGS (Site 3 A)
	(Excavation)

Test No. 5	
Wet Density	96.3
Moisture	8.7
Dry Density	87.6
% Moisture	9.9
% Compaction:	
Location:	2' BGS (Site 3 A)
	(Excavation)

Test No. 6	
Wet Density	88.1
Moisture	10.0
Dry Density	78.1
% Moisture	12.7
% Compaction:	
Location:	2' BGS (Site 3 A)
	(Excavation)

Test No. 7	
Wet Density	93.3
Moisture	10.0
Dry Density	83.3
% Moisture	11.9
% Compaction:	
Location:	4' BGS (Site 3 A)
	(Excavation)

Test No. 8	
Wet Density	93.2
Moisture	9.9
Dry Density	83.3
% Moisture	11.8
% Compaction:	
Location:	4' BGS (Site 3 A)
	(Excavation)

This report was prepared by:

Lab Manager

SUMMIT TECHNICAL, INC.

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Bayard, NM 88023

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505-537-3774 fax

FIELD RESULTS FOR SOIL DENSITIES

Date: May 10, 2005
Customer: Golder Associates, Inc.
Project: Tyrone Lysimeter Installation
Tailings Stockpile #1
Project No.: 013-1595

Proctor
Bench Areas

Test No. 9
Wet Density 96.3
Moisture 6.7
Dry Density 89.6
% Moisture 7.5
% Compaction:
Location: 4' BGS (Site 3 A)
(Excavation)

Test No. 10
Wet Density 93.8
Moisture 10.5
Dry Density 83.3
% Moisture 12.5
% Compaction:
Location: 6' BGS (Site 3 A)
(Excavation)

Test No. 11
Wet Density 96.8
Moisture 9.1
Dry Density 87.7
% Moisture 10.4
% Compaction:
Location: 6' BGS (Site 3 A)
(Excavation)

Test No. 12
Wet Density 84.1
Moisture 5.7
Dry Density 78.4
% Moisture 7.3
% Compaction:
Location: 6' BGS (Site 3 A)
(Excavation)

Test No. 13
Wet Density 106.8
Moisture 10.9
Dry Density 95.9
% Moisture 11.3
% Compaction:
Location: 8' BGS (Site 3 A)
(Excavation)

Test No. 14
Wet Density 92.4
Moisture 11.0
Dry Density 81.4
% Moisture 13.6
% Compaction:
Location: 8' BGS (Site 3 A)
(Excavation)

Test No. 15
Wet Density 93.2
Moisture 13.2
Dry Density 80.0
% Moisture 16.5
% Compaction:
Location: 8' BGS (Site 3 A)
(Excavation)

Test No.
Wet Density
Moisture
Dry Density
% Moisture
% Compaction:
Location:

This report was prepared by:

Lab Manager

SUMMIT TECHNICAL, INC.

For all your construction and engineering technical services

P.O. Box 475
Bayard, NM 88023

505 537-3444
505 537-3771 fax

MOISTURE DENSITY RELATIONSHIP OF SOILS

Customer: Golder Associates, Inc.
Date Tested: May, 12 2005
Project Name: Tryone Lysimeter Installation

Project No.:

Location: **Site 8A, Tailings Stockpile#1**

Test Type: Sieve Analysis/Moisture Density Relationship

Procedure: ASTM C-117, ASTM C-136, & ASTM D-1557 A
Soil Type: Tailings-Silty sandy, gravel
Yellowish/brown

Sieve Size	Total Sample % Passing	Spec's. % Passing
1"		
3/4"	0	
1/2"	95	
3/8"	87	
No. 4	71	
No. 8	57	
No. 16	46	
No. 30	37	
No. 50	31	
No. 100	26	
No. 200	21.3	
DUST RATIO	0.03	± <0.30 %

Maximum Dry Density: 132 lbs./cu. ft
Optimum Moisture: 8.0%

% Material Field Moisture: 6.5%

ASTM C-117: 20.7%

Fractured Faces		
Liquid Limit		
Plasticity Index		
Soils Classification		
Estimated R-Value		

This report was prepared by:

Lab Manager

SUMMIT TECHNICAL, INC.

For all your construction and engineering testing services

P.O. Box 475
Bayard, NM 88023

505-537-3460
505-537-3474 fax

FIELD RESULTS FOR SOIL DENSITIES

Date: May 4, 2005
Customer: Golder Associates, Inc.
Project: Tyrone Lysimeter Installation
Tailings Stockpile #1
Project No.: 013-1595

Proctor
Bench Areas

Test No. 1	
Wet Density	91.1
Moisture	10.7
Dry Density	80.4
% Moisture	13.3
% Compaction:	
Location:	8' BGS North (Site 8 A)
	(Excavation)

Test No. 2	
Wet Density	86.0
Moisture	13.0
Dry Density	73.0
% Moisture	17.8
% Compaction:	
Location:	8' BGS Northeast (Site 8 A)
	(Excavation)

Test No. 3	
Wet Density	96.4
Moisture	8.9
Dry Density	87.5
% Moisture	10.1
% Compaction:	
Location:	8' BGS West (Site 8 A)
	(Excavation)

Test No. 4	
Wet Density	87.4
Moisture	8.1
Dry Density	79.3
% Moisture	10.2
% Compaction:	
Location:	6' BGS Southwest (Site 8 A)
	(Excavation)

Test No. 5	
Wet Density	63.5
Moisture	13.8
Dry Density	49.7
% Moisture	27.8
% Compaction:	
Location:	6' BGS East (Site 8 A)
	(Excavation)

Test No. 6	
Wet Density	105.9
Moisture	11.9
Dry Density	94.1
% Moisture	12.6
% Compaction:	
Location:	6' BGS North (Site 8 A)
	(Excavation)

Test No. 7	
Wet Density	65.5
Moisture	9.3
Dry Density	56.2
% Moisture	16.5
% Compaction:	
Location:	6' BGS Northwest (Site 8 A)
	(Excavation)

Test No. 8	
Wet Density	73.3
Moisture	11.3
Dry Density	89.7
% Moisture	12.6
% Compaction:	
Location:	4' BGS Southwest (Site 8 A)
	(Excavation)

This report was prepared by: _____
Lab Manager

SUMMIT TECHNICAL, INC.
For all your construction and engineering testing services
P.O. Box 245
Bayard, NM 88023
505-537-3445
505-537-3771 fax

FIELD RESULTS FOR SOIL DENSITIES

Date: May 4, 2005
Customer: Golder Associates, Inc.
Project: Tyrone Lysimeter Installation
Tailings Stockpile #1
Project No.: 013-1595

Proctor
Bench Areas

Test No. 9
Wet Density 65.7
Moisture 9.8
Dry Density 55.9
% Moisture 17.5
% Compaction:
Location: 4' BGS West (Site 8 A)
(Excavation)

Test No. 10
Wet Density 67.3
Moisture 11.6
Dry Density 82.4
% Moisture 14.1
% Compaction:
Location: 4' BGS Northwest (Site 8 A)
(Excavation)

Test No. 11
Wet Density 110.3
Moisture 10.2
Dry Density 100.0
% Moisture 10.2
% Compaction:
Location: 4' BGS North (Site 8 A)
(Excavation)

Test No. 12
Wet Density 91.9
Moisture 8.6
Dry Density 83.3
% Moisture 10.3
% Compaction:
Location: 2' BGS North (Site 8 A)
(Excavation)

Test No. 13
Wet Density 92.7
Moisture 11.5
Dry Density 81.2
% Moisture 14.2
% Compaction:
Location: 2' BGS Northeast (Site 8 A)
(Excavation)

Test No. 14
Wet Density 100.7
Moisture 9.8
Dry Density 90.9
% Moisture 10.8
% Compaction:
Location: 2' BGS West (Site 8 A)
(Excavation)

Test No.
Wet Density
Moisture
Dry Density
% Moisture
% Compaction:
Location:

Test No.
Wet Density
Moisture
Dry Density
% Moisture
% Compaction:
Location:

This report was prepared by:

Lab Manager

For all your construction and engineering technical services

P.O. Box 4 85
Bayard, NM 88023

505-537-3444
505-537-3754 fax

FIELD RESULTS FOR SOIL DENSITIES

Date: May 4, 2005
Customer: Golder Associates, Inc.
Project: Tyrone Lysimeter Installation
Tailings Stockpile #1
Project No.: 013-1595

Proctor
Bench Areas

Test No. 1
Wet Density 107.8
Moisture 9.8
Dry Density 98.0
% Moisture 10.0
% Compaction:
Location: 2' Top of Inside Lysimeter North (Site 8 A)
(Backfill)

Test No. 2
Wet Density 87.9
Moisture 9.1
Dry Density 78.8
% Moisture 11.6
% Compaction:
Location: 2' Top of Inside Lysimeter North (Site 8 A)
(Backfill)

Test No. 3
Wet Density 99.9
Moisture 8.9
Dry Density 91.0
% Moisture 9.8
% Compaction:
Location: 2' Top of Inside Lysimeter North (Site 8 A)
(Backfill)

Test No. 4
Wet Density 92
Moisture 8.1
Dry Density 83.9
% Moisture 9.6
% Compaction:
Location: 4' Top of Lysimeter Center (Site 8 A)
(Backfill)

Test No. 5
Wet Density 100.0
Moisture 8.2
Dry Density 91.9
% Moisture 8.9
% Compaction:
Location: 4' Top of Lysimeter East (Site 8 A)
(Backfill)

Test No. 6
Wet Density 88.5
Moisture 10.7
Dry Density 88.5
% Moisture 13.8
% Compaction:
Location: 4' Top of Lysimeter West (Site 8 A)
(Backfill)

Test No. 7
Wet Density 99.1
Moisture 9.5
Dry Density 89.7
% Moisture 10.6
% Compaction:
Location: 4' BGS Southeast (Site 8 A)
(Backfill)

Test No. 8
Wet Density 98.4
Moisture 8.4
Dry Density 90.0
% Moisture 9.4
% Compaction:
Location: 4' BGS West (Site 8 A)
(Backfill)

This report was prepared by:

Lab Manager

SUMMIT TECHNICAL, INC.
For all your construction and engineering technical services
P.O. Box 475
Bayard, NM 88023
505-537-3430
505-537-3774 fax

FIELD RESULTS FOR SOIL DENSITIES

Date: May 4, 2005
Customer: Golder Associates, Inc.
Project: Tyrone Lysimeter Installation
Tailings Stockpile #1
Project No.: 013-1595

Proctor
Bench Areas

Test No. 9		Test No.
Wet Density	91.9	Wet Density
Moisture	8.5	Moisture
Dry Density	83.4	Dry Density
% Moisture	10.2	% Moisture
% Compaction:		% Compaction:
Location:	4' BGS North (Site 8 A) **(Backfill)**	Location:
Test No.		Test No.
Wet Density		Wet Density
Moisture		Moisture
Dry Density		Dry Density
% Moisture		% Moisture
% Compaction:		% Compaction:
Location:		Location:
Test No.		Test No.
Wet Density		Wet Density
Moisture		Moisture
Dry Density		Dry Density
% Moisture		% Moisture
% Compaction:		% Compaction:
Location:		Location:
Test No.		Test No.
Wet Density		Wet Density
Moisture		Moisture
Dry Density		Dry Density
% Moisture		% Moisture
% Compaction:		% Compaction:
Location:		Location:

This report was prepared by: Lab Manager

SUMMIT TECHNICAL, INC.

For all your construction and engineering technical services.

P.O. Box [illegible]
Bayard, NM [illegible]

505-[illegible]
505-[illegible] fax

FIELD RESULTS FOR SOIL DENSITIES

Date: May 5, 2005
Customer: Golder Associates, Inc.
Project: Tyrone Lysimeter Installation
Tailings Stockpile #1
Project No.: 013-1595

Proctor
Bench Areas

Test No. 10	
Wet Density	109.8
Moisture	10.2
Dry Density	99.6
% Moisture	10.2
% Compaction:	
Location:	2' BGS (Site 8 A) **(Backfill)**

Test No. 14	
Wet Density	100.7
Moisture	6.8
Dry Density	93.9
% Moisture	7.2
% Compaction:	
Location:	Top (Site 8 A) **(Backfill)**

Test No. 11	
Wet Density	100.8
Moisture	9.8
Dry Density	91.0
% Moisture	10.7
% Compaction:	
Location:	2' BGS (Site 8 A) **(Backfill)**

Test No. 15	
Wet Density	104.1
Moisture	7.8
Dry Density	96.2
% Moisture	8.1
% Compaction:	
Location:	Top (Site 8 A) **(Backfill)**

Test No. 12	
Wet Density	98.6
Moisture	9.5
Dry Density	89.1
% Moisture	10.7
% Compaction:	
Location:	2' BGS (Site 8 A) **(Backfill)**

Test No.	
Wet Density	
Moisture	
Dry Density	
% Moisture	
% Compaction:	
Location:	

Test No. 13	
Wet Density	92.7
Moisture	8.4
Dry Density	84.3
% Moisture	10.0
% Compaction:	
Location:	Top (Site 8 A) **(Backfill)**

Test No.	
Wet Density	
Moisture	
Dry Density	
% Moisture	
% Compaction:	
Location:	

This report was prepared by:

Lab Manager

SUMMIT TECHNICAL, INC.

For all your construction and engineering technical services

P.O. Box 675
Bayard, NM 88023

505-537-3460
505-537-3474 (fx)

FIELD RESULTS FOR SOIL DENSITIES

Date: May 4, 2005
Customer: Golder Associates, Inc.
Project: Tyrone Lysimeter Installation
Tailings Stockpile #1
Project No.: 013-1595

Proctor
Top Surface

Test No. 1		Test No.
Wet Density	103.0	Wet Density
Moisture	8.8	Moisture
Dry Density	94.3	Dry Density
% Moisture	9.3	% Moisture
% Compaction:		% Compaction:
Location:	Surrounding Areas (50' North of Lysimeter) **(Natural Ground)** Site 8A	Location:

Test No. 2		Test No.
Wet Density	67.5	Wet Density
Moisture	6.9	Moisture
Dry Density	60.6	Dry Density
% Moisture	11.4	% Moisture
% Compaction:		% Compaction:
Location:	Surrounding Areas (50' East of Lysimeter) **(Natural Ground)** Site 8A	Location:

Test No. 3		Test No.
Wet Density	68.1	Wet Density
Moisture	7.2	Moisture
Dry Density	60.9	Dry Density
% Moisture	11.7	% Moisture
% Compaction:		% Compaction:
Location:	Surrounding Areas (70' South of Lysimeter) **(Natural Ground)** Site 8A	Location:

Test No.		Test No.
Wet Density		Wet Density
Moisture		Moisture
Dry Density		Dry Density
% Moisture		% Moisture
% Compaction:		% Compaction:
Location:		Location:

This report was prepared by:

Lab Manager

SUMMIT TECHNICAL, INC.

For all your construction and engineering materials services

P.O. Box 475
Bayard, NM 88023

505-537-3445
505-537-3771 fax

FIELD RESULTS FOR SOIL DENSITIES

Date: May 5, 2005
Customer: Golder Associates, Inc.
Project: Tyrone Lysimeter Installation
Tailings Stockpile #1
Project No.: 013-1595

Proctor
Bench Areas

Test No. 1
Wet Density 106.2
Moisture 7.5
Dry Density 98.8
% Moisture 7.5
% Compaction:
Location: Top of Surface (Site 1 A)
(Excavation)

Test No. 2
Wet Density 98.0
Moisture 9.6
Dry Density 88.4
% Moisture 10.8
% Compaction:
Location: Top of Surface (Site 1 A)
(Excavation)

Test No. 3
Wet Density 106.7
Moisture 9.8
Dry Density 96.8
% Moisture 10.2
% Compaction:
Location: Top of Surface (Site 1 A)
(Excavation)

Test No. 4
Wet Density 92.2
Moisture 14.4
Dry Density 77.8
% Moisture 18.4
% Compaction:
Location: 2' BGS (Site 1 A)
(Excavation)

Test No. 5
Wet Density 103.6
Moisture 16.5
Dry Density 87.1
% Moisture 18.9
% Compaction:
Location: 2' BGS (Site 1 A)
(Excavation)

Test No. 6
Wet Density 82.8
Moisture 12.0
Dry Density 70.8
% Moisture 16.9
% Compaction:
Location: 2' BGS (Site 1 A)
(Excavation)

Test No. 7
Wet Density 103.2
Moisture 17.9
Dry Density 85.3
% Moisture 20.9
% Compaction:
Location: 4' BGS (Site 1 A)
(Excavation)

Test No. 8
Wet Density 104.7
Moisture 17.3
Dry Density 87.4
% Moisture 19.7
% Compaction:
Location: 4' BGS (Site 1 A)
(Excavation)

This report was prepared by:

Lab Manager

SUMMIT TECHNICAL, INC.
For all your construction and engineering technical services
P.O. Box 485
Bayard, NM 88023
505-537-3444
505-537-3771 fax

FIELD RESULTS FOR SOIL DENSITIES

Date: May 5, 2005
Customer: Golder Associates, Inc.
Project: Tyrone Lysimeter Installation
Tailings Stockpile #1
Project No.: 013-1595

Proctor
Bench Areas

Test No. 9
Wet Density 93.7
Moisture 14.5
Dry Density 79.2
% Moisture 18.3
% Compaction:
Location: 4' BGS (Site 1 A)
(Excavation)

Test No. 10
Wet Density 96.5
Moisture 18.4
Dry Density 78.1
% Moisture 23.5
% Compaction:
Location: 6' BGS (Site 1 A)
(Excavation)

Test No. 11
Wet Density 89.5
Moisture 15.1
Dry Density 74.4
% Moisture 20.3
% Compaction:
Location: 6' BGS (Site 1 A)
(Excavation)

Test No. 12
Wet Density 92.4
Moisture 16.9
Dry Density 75.5
% Moisture 22.4
% Compaction:
Location: 6' BGS (Site 1 A)
(Excavation)

Test No. 13
Wet Density 95.6
Moisture 14.4
Dry Density 81.2
% Moisture 17.7
% Compaction:
Location: 8' BGS (Site 1 A)
(Excavation)

Test No. 14
Wet Density 101.7
Moisture 17.3
Dry Density 84.4
% Moisture 20.4
% Compaction:
Location: 8' BGS (Site 1 A)
(Excavation)

Test No. 15
Wet Density 89.0
Moisture 12.9
Dry Density 76.0
% Moisture 17.0
% Compaction:
Location: 8' BGS (Site 1 A)
(Excavation)

Test No.
Wet Density
Moisture
Dry Density
% Moisture
% Compaction:
Location:

This report was prepared by:

Lab Manager

SUMMIT TECHNICAL, INC.

For all your construction and engineering technical services

P.O. Box 475
Bayard, NM 88023

505-537-3466
505-537-3774 fax

FIELD RESULTS FOR SOIL DENSITIES

Date: May 10, 2005
Customer: Golder Associates, Inc.
Project: Tyrone Lysimeter Installation
Tailings Stockpile #1
Project No.: 013-1595

Proctor
Bench Areas

Test No. 16
Wet Density 91.8
Moisture 8.4
Dry Density 83.4
% Moisture 10.1
% Compaction:
Location: Inside - 2' off Bottom of Tank (Site 1 A)
(Backfill)

Test No. 17
Wet Density 91.0
Moisture 10.1
Dry Density 80.8
% Moisture 12.5
% Compaction:
Location: Inside - 2' off Bottom of Tank (Site 1 A)
(Backfill)

Test No. 18
Wet Density 87.6
Moisture 8.9
Dry Density 78.7
% Moisture 11.3
% Compaction:
Location: Inside - 2' off Bottom of Tank (Site 1 A)
(Backfill)

Test No. 19
Wet Density 91.4
Moisture 10.1
Dry Density 81.3
% Moisture 12.4
% Compaction:
Location: Inside - 4' off Bottom of Tank (Site 1 A)
(Backfill)

Test No. 20
Wet Density 103.0
Moisture 11.0
Dry Density 92.1
% Moisture 11.9
% Compaction:
Location: Inside - 4' off Bottom of Tank (Site 1 A)
(Backfill)

Test No. 21
Wet Density 97.2
Moisture 9.1
Dry Density 88.1
% Moisture 10.4
% Compaction:
Location: Inside - 4' off Bottom of Tank (Site 1 A)
(Backfill)

Test No. 22
Wet Density 94.8
Moisture 9.5
Dry Density 85.3
% Moisture 11.1
% Compaction:
Location: 2' Above Tank & 4' BG (Site 1 A)
(Backfill)

Test No. 23
Wet Density 89.2
Moisture 11.2
Dry Density 78.0
% Moisture 14.4
% Compaction:
Location: 2' Above Tank & 4' BG (Site 1 A)
(Backfill)

This report was prepared by:

Lab Manager

SUMMIT TECHNICAL, INC.

For all your construction and engineering technical services

P.O. Box 475
Bayard, NM 88023

505-537-3466
505-537-3774 fax

FIELD RESULTS FOR SOIL DENSITIES

Date: May 10, 2005
Customer: Golder Associates, Inc.
Project: Tyrone Lysimeter Installation
Tailings Stockpile #1
Project No.: 013-1595

Proctor
Bench Areas

Test No. 24
Wet Density 95.2
Moisture 12.3
Dry Density 82.9
% Moisture 14.8
% Compaction:
Location: 2' Above Tank & 4' BG (Site 1 A)
(Backfill)

Test No. 25
Wet Density 104.2
Moisture 9.1
Dry Density 95.1
% Moisture 9.6
% Compaction:
Location: 4' Above Tank & 2' BG (Site 1 A)
(Backfill)

Test No. 26
Wet Density 101.2
Moisture 9.9
Dry Density 91.4
% Moisture 10.8
% Compaction:
Location: 4' Above Tank & 2' BG (Site 1 A)
(Backfill)

Test No. 27
Wet Density 97.0
Moisture 7.9
Dry Density 89.1
% Moisture 8.8
% Compaction:
Location: 4' Above Tank & 2' BG (Site 1 A)
(Backfill)

Test No. 28
Wet Density 97.5
Moisture 8.0
Dry Density 89.5
% Moisture 9.0
% Compaction:
Location: Top (Site 1 A)
(Backfill)

Test No. 29
Wet Density 98.6
Moisture 10.5
Dry Density 88.2
% Moisture 11.9
% Compaction:
Location: Top (Site 1 A)
(Backfill)

Test No. 30
Wet Density 111.5
Moisture 10.0
Dry Density 101.6
% Moisture 9.8
% Compaction:
Location: Top (Site 1 A)
(Backfill)

Test No.
Wet Density
Moisture
Dry Density
% Moisture
% Compaction:
Location:

This report was prepared by: _____
Lab Manager

APPENDIX H

METEOROLOGICAL STATION CALIBRATION DOCUMENTATION

No. 1 Stockpile Top Surface 4' cover

Calibration Certificate

Calibration Date:	May 16, 2005
Work Order No.:	01786
Transducer Type:	PDCR 1830-8388
Serial Number:	2148658
Range:	5 psi g
Supply:	10 Volts
Sensitivity:	49.35 mV
Non-linearity & Hysteresis:	±0.1% BSL
Temperature Operating Range:	
Compensated Temperature Range:	-2° to +30°C
Temperature Error Band:	±0.3%
Thermal Zero Shift:	
Thermal Sensitivity Shift:	

Electrical Connection

	Monitor
Supply Positive: RED	ORANGE
Supply Negative: WHITE	BLACK
Output Positive: YELLOW	
Output Negative: BLUE	
Screen: CONNECTED TO BODY	

Notes:

100 ft. of depth cable

D
11

GE Infrastructure
Sensing
4 Dunham Drive
New Fairfield, CT 06812
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F 203-746-2494
www.gesensing.com

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F +31-(0)15-2620351
E info.holland@kippzonen.com
Website www.kippzonen.com

CALIBRATION CERTIFICATE
PYRANOMETER

PYRANOMETER MODEL	:	SP LITE
SERIAL NUMBER	:	042850
SENSITIVITY	:	10.30 µV/Wm^{-2}
REFERENCE PYRANOMETER:		Kipp & Zonen SP LITE PROTO 1 active from February 10, 2003.

CALIBRATION PROCEDURE :

A 1000W tungsten-halogen filament lamp produces a directed vertical beam (divergence 3.5°). The irradiance at the pyranometer stand is approx. 500 W/m². First the signal of the reference SP LITE is registered. Next the signal is registered of a test SP LITE in the same position as the reference SP LITE. Finally the reference SP LITE signal is registered again. A stability check is done and if OK, the test SP LITE sensitivity is calculated from the ratio; test signal / mean reference signal. Because test and reference SP LITE are of the same model, the indoor conditions have at principle no influence on the transfer of calibration. The above sensitivity is theoretically best for conditions as during the calibration of the reference SP LITE outdoors in Delft.

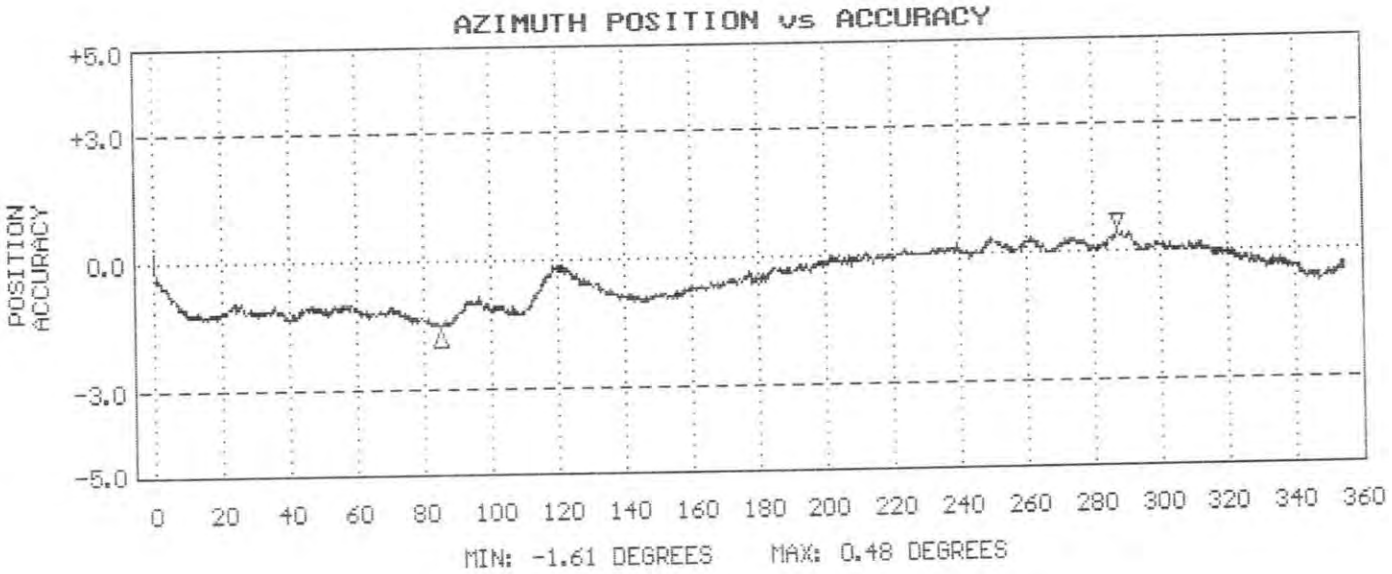
HIERARCHY OF TRACEABILITY:

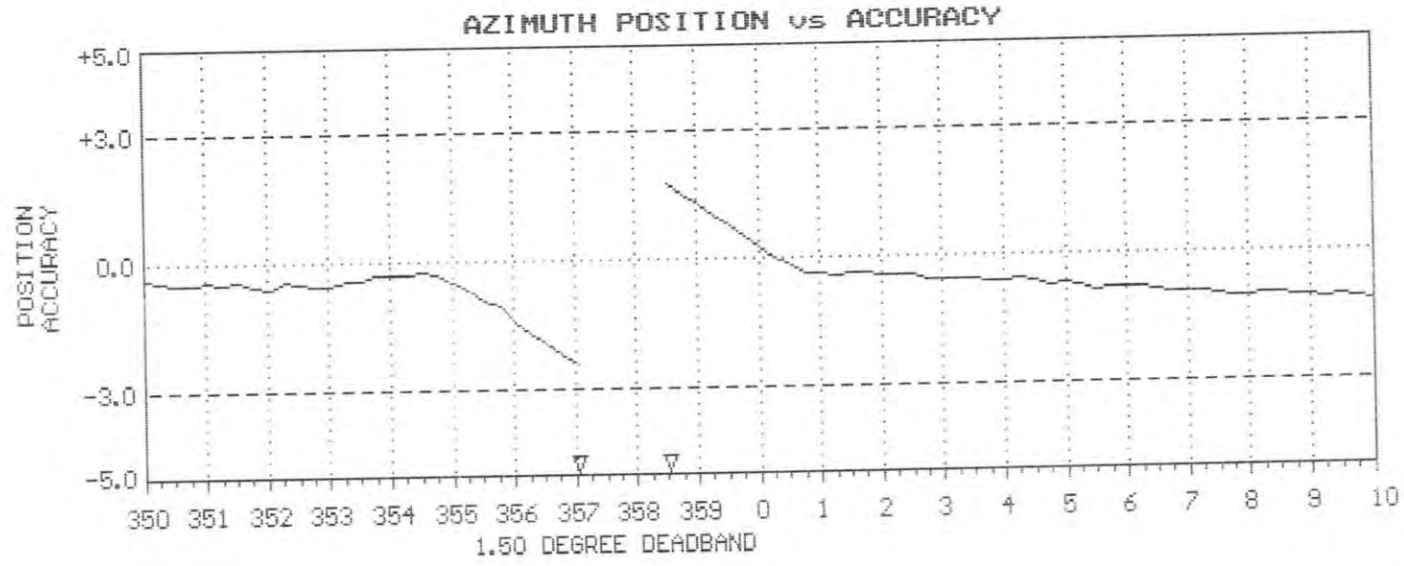
The SP LITE PROTO1 has been compared in Delft on August 13, 2002 with the sun and sky and reflected ground radiation as source under clear sky conditions. The total hemispherical radiation is measured with a pyranometer CM 11 sn966086. This "transfer" pyranometer is calibrated in 2002 against the reference CM 11 sn913550 which on his turn was calibrated in Davos against the Word Standard Group in August 2001. The instruments were placed side by side on a tracking platform in such a way that the direct radiation was always normal incident.
During the calibration in Delft, the sky was blue with 1/8 cumulus clouds.
The instrument temperature was approx. 20°C.
Because the sensitivity of the SP Lite is spectrum dependent Kipp & Zonen decided to calibrate at the "mean" Airmass 1.5. At the two moments with Airmass 1.5 the reference SP Lite received stationary irradiances of 940 resp. 960 W/m². The sensitivity is determined from a direct calculation and recording of the momentaneous sensitivity of the SP LITE. We found that the sensitivity of the SP Lite has a minimum of 84 µV/W/m² at solar noon (Airmass 1.25) and sensitivities of 86.4 at 11:10 civil time and 86.0 at 16:30 (both at z= 48° and Airmass 1.5). The mean sensitivity and estimated uncertainty of the SP LITE PROTO 1 for Airmass 1.5 radiation is 86.2 +/- 0.5 µV/W/m².

IN CHARGE OF TEST : G. v/d Wilt, 28-Jun-04, Kipp & Zonen, Delft, Holland

R. M. YOUNG COMPANY WIND SENSOR CALIBRATION CERTIFICATE

SENSOR: 05103-5 WIND MONITOR
SENSOR SERIAL NUMBER: WM65247
BEARINGS: SEALED/GREASE LUBE
DATE: JAN 27 2005
WIND SPEED THRESHOLD TEST: PASS
LOW WIND SPEED AMPLITUDE/FREQUENCY TEST: PASS
HIGH WIND SPEED AMPLITUDE/FREQUENCY TEST: PASS
VANE TORQUE TEST: PASS
SPECIAL NOTES:
SPECIAL NOTES:

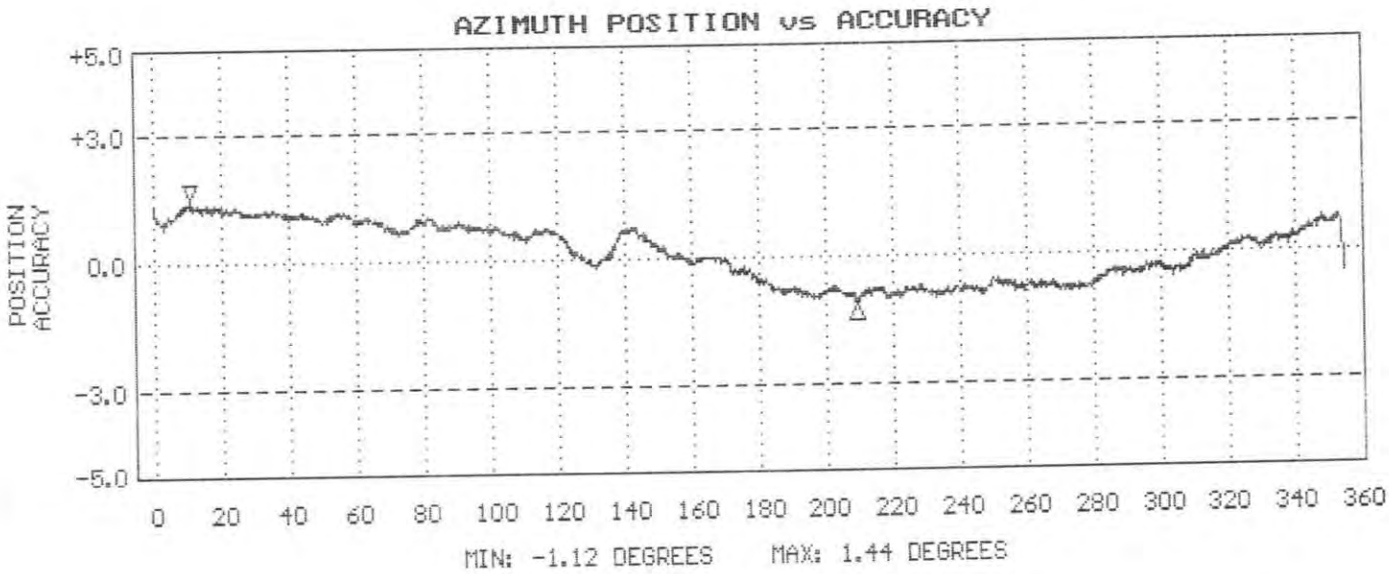


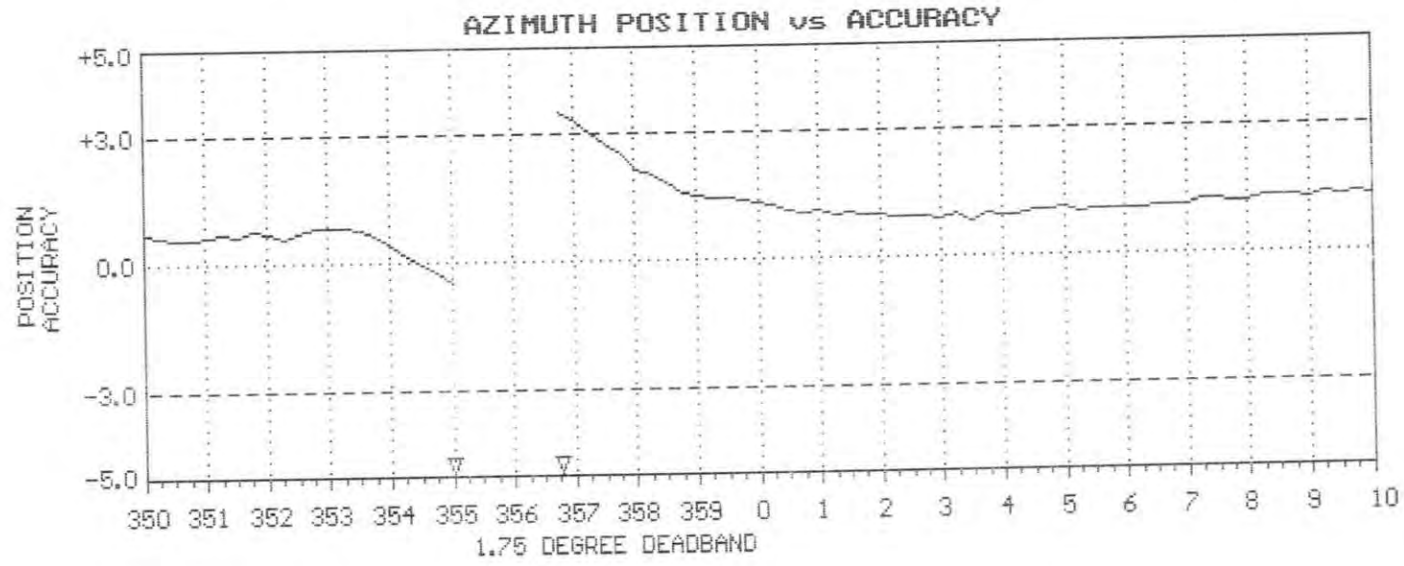


NOTE: Azimuth Position vs Accuracy graphs are accurate to within 0.5 degrees. The accuracy shown in the potentiometer deadband region between 355 and 0 degrees is the result of no resistance change while position changes. The gap represents the actual deadband (open circuit).

R. M. YOUNG COMPANY WIND SENSOR CALIBRATION CERTIFICATE

SENSOR: 05103-5 WIND MONITOR
SENSOR SERIAL NUMBER: WM65252
BEARINGS: SEALED/GREASE LUBE
DATE: JAN 27 2005
WIND SPEED THRESHOLD TEST: PASS
LOW WIND SPEED AMPLITUDE/FREQUENCY TEST: PASS
HIGH WIND SPEED AMPLITUDE/FREQUENCY TEST: PASS
VANE TORQUE TEST: PASS
SPECIAL NOTES:
SPECIAL NOTES:





NOTE: Azimuth Position vs Accuracy graphs are accurate to within 0.5 degrees. The accuracy shown in the potentiometer deadband region between 355 and 0 degrees is the result of no resistance change while position changes. The gap represents the actual deadband (open circuit).

VAISALA

Certificate report nr. H06-04480107

CALIBRATION CERTIFICATE

Instrument	HMP45AC Humidity and temperature probe
Serial number	Z4840024
Manufacturer	Vaisala Oyj, Finland
Calibration date	26th November 2004
Test procedure	Doc210426-A

The above instrument was calibrated by comparing the relative humidity and temperature readings to two HMP233 factory working standards. At the time of shipment, the instrument described above met its operating specifications.

The relative humidity readings of the two HMP233 factory working standards have been calibrated at the Vaisala factory by using Hygro M-3 dewpoint meter. Hygro M-3 dewpoint meter has been calibrated at Vaisala Measurement Standards Laboratory (MSL) by using the MSL primary standard traceable to the NIST. The temperature readings of the two HMP233 factory working standards have been calibrated at MSL by using the MSL working standard traceable to the NIST. The temperature calibration at MSL has been accredited by the FINAS according to the ISO/IEC 17025.

Calibration results

Reference humidity* % RH	Observed humidity % RH	Difference %RH	Permissible difference %RH
0.3	1.0	+ 0.7	±2.0
42.9	43.0	+ 0.1	±2.0
76.4	77.2	+ 0.8	± 2.0
Reference temperature* °C	**Observed temperature** °C	**Difference** °C	**Permissible difference** °C
+ 22.06	+22.11	+ 0.05	± 0.2

*Average of two references.

Equipment used in calibration

Type	Serial number	Calibration date	Certificate number
HMP233 / RH	623075	2004-10-19	H06-04430001
HMP233 / RH	R2420022	2004-10-19	H06-04430002
Vaisala HMP233 / T	623075	2004-02-16	K008-M00234
Vaisala HMP233 / T	R2420022	2004-02-16	K008-M00233
HYGRO M-3	361095	2003-11-10	L01625
HP 34401A	3146A68712	2004-10-26	INSPECTA K004-04S600

Uncertainties (95 % confidence level, k=2)
Humidity ±1.0%RH @ 0..15%RH, ±1.5%RH @ 15..78%RH
Temperature ± 0.13 °C
Ambient conditions / Humidity 12 ± 5%RH, Temperature 22 ± 1 °C, Pressure 1008 ± 1 hPa.

For Vaisala Oyj

Siviä Kaasinen

 Doc210425-B

Vaisala Oyj
Vanha Nurmijärventie 21
FIN-01670 Vantaa, Finland

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Fax (+ 358 9) 8949 2295
http://www.vaisala.com

Domicile Vantaa, Finland
Trade Reg. No. 96.607

MODEL 525 SERIES CERTIFICATION/CALIBRATION INFORMATION

The sequence for calibration after the sensors are completely assembled is as follows:

1. The completed tipping bucket assembly is tested using a high-speed digital counter to check for multiple counts or missed counts and proper positioning of the sensor and actuator, then the assembly is installed into the main housing in which it will be shipped.

2. Sensors are than moved to the calibration stand that incorporates a bank of Micro Metering Pumps that output at the rate of 1 inch per hour and a volume equal to 100 counts. The sensors are run through the calibration cycle until achieving 99 to 101 counts 3 times in a row.

The last 3 readings for this sensor were: 100.5 99.9 100.2

Calibration Date: _____ S/N 35464-305

BY: _____

NOTICE!

During shipment the tipping assembly has been secured to avoid possible damage to the pivot assembly. Lift off collector and remove rubber band from inside to release tipping mechanism before installation.