
SUMMARY OF
FIELD OVERSIGHT ACTIVITIES
JUNE 2 THROUGH NOVEMBER 6, 1992

TUTU WELL FIELD SITE
ST. THOMAS, U.S. VIRGIN ISLANDS



CDM FEDERAL PROGRAMS CORPORATION
a subsidiary of Camp Dresser & McKee Inc.

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Prepared for

**U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Waste Programs Enforcement
Washington, D.C. 20460**

EPA Work Assignment No.	: C02048
EPA Region	: II
Site No.	: 2P1D
Contract No.	: 68-W9-0002
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Telephone Number	: (212) 264-0151
Date Prepared	: December 2, 1992

CDM FEDERAL PROGRAMS CORPORATION
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December 2, 1992

Ms. Caroline Kwan
U.S. Environmental Protection Agency
26 Federal Plaza
New York, New York 10278

PROJECT: TES V, EPA Contract No. 68-W9-0002
Work Assignment: C02048

DOCUMENT NO: TESH-C02081-LR-CSCF

SUBJECT: Summary of Field Oversight Activities
June 2 Through November 6
Tutu Wells Site, St. Thomas, USVI

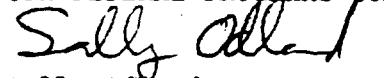
Dear Ms. Kwan:

Attached is the summary report of CDM Federal's oversight of all field activities conducted by the Tutu Environmental Investigation Committee (TEIC) at the Tutu Wells Site, St. Thomas, U.S. Virgin Islands during the period beginning June 2, 1992 and ending November 6, 1992. Field activities performed during this period include the drilling of soil borings, the installation and development of monitoring wells, the sampling of groundwater and testing of the aquifer response to pumping. A copy of the field logbook is included as an appendix.

If you have any questions regarding this report, please do not hesitate to call me at (212) 393-9634.

Sincerely,

CDM FEDERAL PROGRAMS CORPORATION


Sally Odland
Work Assignment Manager

attachment

TUT 005 2169

CDM FEDERAL PROGRAMS CORPORATION
a subsidiary of Camp Dresser & McKee Inc.

December 2, 1992

Mr. Erwin Smieszek
TES V Regional Project Officer
U.S. Environmental Protection Agency
26 Federal Plaza, Room 737
New York, NY 10278

PROJECT: TES V, EPA CONTRACT NO: 68-W9-0002
Work Assignment C02048
Tutu Well Field Site
St. Thomas, U.S. Virgin Islands

DOCUMENT NO: TESH-C02048-EP-CSCD

SUBJECT: Summary of Field Oversight Activities
June 2 Through November 6, 1992
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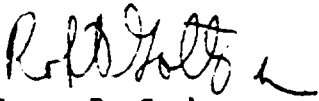
Dear Mr. Smieszek:

Please find enclosed the letter report titled "Summary of Field Oversight Activities, June 2 Through November 6, 1992" for the Tutu Well Field Site, St. Thomas, U.S. Virgin Islands, as partial fulfillment of the reporting requirements for work assignment C02048.

If you have any comments regarding this submittal, please contact Sally Odland of CDM Federal Programs Corporation at (212) 393-9634 within two weeks from the date of this letter.

Sincerely,

CDM FEDERAL PROGRAMS CORPORATION



Scott B. Graber
TES V REGIONAL MANAGER

Attachment

cc: C. Kvan, EPA Work Assignment Manager
S. Odland, CDM FPC Work Assignment Manager
Document Control, CDM FEDERAL PROGRAMS CORPORATION (2 copies)
NYC File

TUT 005 2170

SUMMARY OF FIELD OVERSIGHT ACTIVITIES
JUNE 2 - NOVEMBER 6, 1992
TUTU WELLFIELD SITE
ST THOMAS, US VIRGIN ISLANDS

CDM Federal provided continual oversight of remedial investigation field activities performed by the Tutu Environmental Investigation Committee's (TEIC's) contractor, Geraghty and Miller (G&M) at the Tutu Wellfield Site, St. Thomas, U.S Virgin Islands from June 2, 1992 to November 6, 1992.

The Tutu Wells site is located in the upper Turpentine Run basin in east central St. Thomas (Figure 1). Previous studies by G&M and the U.S. Geological Survey (USGS) determined that the upper Turpentine Run basin was heavily used for groundwater supply. Two gas stations (Esso and Texaco) and numerous other commercial establishments are located within the site area. In 1987, sampling of supply wells in the area by the USEPA Technical Assistant Team (TAT) revealed the presence of volatile organic compounds (VOCs) in the Tillet Well. The most common compounds found were gasoline constituents and chlorinated organic compounds.

In 1988 soil gas surveys were performed at the Texaco and Esso gas stations and vicinities.

In the vicinity of the Texaco station, hydrocarbons in soil gas were detected near the former underground storage tank, extending southwest toward the intersection of Highways 384 and 38. They were also detected in the southern portion of the Four Winds Shopping Center parking lot. Of the chlorinated compounds, only PCE was consistently detected in the vicinity of the LAGA building and the Tillett well.

In the vicinity of the Esso station, benzene, toluene, ethylbenzene, and xylene (BTEX) were detected above the underground storage tank and north and southwest of the station. Chlorinated hydrocarbons (tetrachloroethylene and trichloroethylene - PCE and TCE) were detected in the the northwest section of the property and PCE in the southwest.

The purpose of G&M's investigation was to delineate the potential sources, the horizontal and vertical extent, and potential migration pathways of petroleum hydrocarbon products and other organic and inorganic contamination in soil and groundwater at the Tutu Wells site.

In order to investigate the sources and delineate the contamination, subsurface borings were drilled and sampled,

shallow and deep monitoring wells were installed and sampled, and surface samples were collected. To corroborate G&M's analytical results, CDM Federal split seven subsurface soil samples from borings and monitoring wells, seven surface soil samples, and four groundwater samples. In addition to the drilling program, G&M performed a pump test in two newly installed wells to determine the hydraulic characteristics of the uppermost aquifer.

FIELD ACTIVITIES

Soil Borings

G&M's soil investigation was designed to identify potential sources and delineate the horizontal and vertical extent of hydrocarbon fuel and other potential constituents, including VOCs, in the soil. Shallow soil borings were drilled, using hollow-stem augers and continuously split-spoon sampled to bedrock or to the water table, whichever was encountered first. After the borings were completed they were refilled with drill cuttings and then grouted to the ground surface. G&M drilled 16 borings at the Tutu Wellfield site. Table 1 presents the number, depth and location for each boring drilled in the Tutu area. Figure 1 displays the boring locations.

An additional 19 borings were drilled for monitoring wells using hollow-stem augers for shallow wells and air hammer and core sampling for deep wells.

A minimum of one sample per boring was sent for chemical analysis by G&M based on GC readings and visual inspection. Samples sent were analyzed for EPA Target Compound List (TCL) VOCs, 1,2-dibromomethane, n-propylbenzene, methyl tert-butyl ether (MTBE), TCL Base/Neutral/Acid Extractables (BNAs), Target Analyte List (TAL) metals, cyanide, and Total Petroleum Hydrocarbons (TPH). G&M collected one field blank for each day on which subsurface soil samples were collected. CDM Federal split seven subsurface soil samples with G&M (See split sample section below).

Monitoring Wells

The purpose of the groundwater investigation was to characterize hydrogeologic conditions and delineate the extent of petroleum hydrocarbon constituents and chlorinated hydrocarbons in groundwater in the site vicinity. Sets of shallow and deep monitoring wells were installed to assess the vertical hydraulic gradients and the vertical extent of contamination beneath the site.

During the field investigation, G&M installed 19 monitoring wells, 12 shallow wells and 7 deep wells throughout the Tutu site (Figure 1 and Table 2). Wells in overburden were constructed

with 4" stainless steel casing and a 20 foot length of 4" stainless steel screen. Where the bedrock was competent, the bedrock wells were constructed with 6" stainless steel casing down to the top of the open hole intake interval. The intake interval was left as a 6" diameter, 20 foot length open hole. Where bedrock was altered, rubbly, and unstable, a 4" diameter stainless steel casing and screen were installed in the bedrock, similar in construction to the overburden wells.

Drill cuttings from monitoring well borings were stored in 55 gallon drums for later analysis and disposal.

Development water, excess drilling fluids, and purge water were stored in containers for later treatment. According to the G&M workplan, the water will be treated to drinking water standards and discharged into the sanitary sewer. However, the treatment and disposal of this water was not overseen by CDM Federal.

Free Product Investigation

A free product investigation was proposed in the G&M Work Plan to determine the thickness, the horizontal extent, and the recoverability of any floating layer of petroleum. In order to to be investigated a thickness of three or more inches of floating product would be considered significant.

Floating petroleum product was observed in three wells, MW-9S, MW-4D, AND MW-5 at the Tutu Wellfield site (See Table 3), at less than the three-inch thickness.

TABLE 3
SUMMARY OF FLOATING PRODUCT THICKNESS
TUTU WELLFIELD SITE

WELL NO.	*DEPTH TO PRODUCT (FT)	*DEPTH TO WATER (FT)	PRODUCT THICKNESS (FT)	DATE
MW-9S	13.0	13.11	0.11	9/28/92
MW-4D	11.43	11.44	0.01	9/28/92
MW-5	22.82	22.83	0.01	9/28/92
MW-9S	12.98	13.02	0.04	10/5/92

*Measured from top of casing

A fourth well, MW-4, was reported by G&M to have a sheen on the groundwater.

Geophysical logging

Caliper and sonic logs were run in the deep borings (within bedrock), prior to setting casing for monitoring wells, to better understand the nature and location of the fractures in the bedrock beneath the Tutu site.

Surface Soil Samples

On August 19, surface soil samples were collected from seven locations by G&M to assess ingestion/inhalation pathways of contaminants for risk assessment purposes. Two samples were collected in the drum area northeast of the Curriculum Center Building; one in the O'Henry Dry Cleaners area; and one in the Tillet Garden Art Center area (for a total of four samples). These samples were analyzed for organic compounds and inorganic analytes. Two background samples were collected from near the northeast corner of the Curriculum Center Building, and one from near the V.I.H.A. Building to the north. Background samples were collected for inorganic analysis only.

Split Samples

Subsurface soil samples were split with G&M, from well borings for MW-8, MW-6D, and MW-9 and from soil borings B-6 and B-1. Table 3 is a summary of those split samples taken on July 22, 24, and 30, 1992. On August 11, CDM Federal personnel collected split subsurface soil samples from borings at locations MW-5 in the Tillet Garden Art Center area, and B-12 in the O'Henry Dry Cleaner area (Table 4).

On August 19, CDM Federal personnel split 100% of the surface soil samples taken by G&M at the Tutu site (seven samples) (Table 5).

Between September 29 and October 1, CDM Federal split 5 aqueous samples (4 groundwater and 1 field blank) with G&M. CDM Federal's samples were analyzed via Routine Analytical Services (RAS) for Target Compounds List (TCL) volatile organic compounds (VOC), TCL base-neutral/acid extractables (BNAs); Target Analyte List (TAL) metals and cyanide. Samples were also analyzed via Special Analytical Services (SAS) for methyl-tertiary-butyl-ether (MTBE), 1,2-dibromoethane, n-propylbenzene and total petroleum hydrocarbons (TPH). Sampling information is found in Tables 6-9.

Pumping Test

Pumping tests were performed on monitoring wells MW-6D (deep) and MW-6R (shallow) to examine the response of the aquifer to pumping stresses and to provide information on the fracture flow system. The pumping tests were overseen by a CDM Federal hydrogeologist. Determination of the pumping rates used was made in concurrence

with the CDM hydrogeologist. The following is a detailed report of the results observed during field oversight.

Step Drawdown Test - MW-6R

On October 30, a five-step drawdown test (3.5, 6.5, 7.75, 9.0, 9.25 gpm) was performed in MW-6R to determine the optimum pumping rate for the pump test. A four-inch, 2 horsepower pump was placed 15 feet below top of casing (BTOC). Depth to groundwater was measured at 5.98 feet BTOC in MW-6R. The following five observation wells (MW-5, MW-6D, MW-7, MW-8, and MW-12D) were used in this test. Because equilibrium was reached in the pumping well within minutes, the time duration for each pumping rate was shortened to 30 minutes. All water from the pumping test was discharged to the Esso Service Station south of the site where it was treated in an air stripping tower to remove volatiles and subsequently discharged to the local sewer system for further treatment at a wastewater treatment facility.

After completion of the step drawdown test the pump was shut off and recovery in the pumping well (MW-6R) and observation wells was monitored until the pumping well had recovered to static conditions or had stabilized within 90% of the static water level.

Due to the limited influence observed during the step drawdown test, Geraghty & Miller decided to run the 24 hr. pump test using a pumping rate of 9.2 gpm which is the maximum pumping rate that could be achieved with the pump used. Total drawdown in the pumping well, MW-6R, during the step drawdown test was 2.52 ft. The data from the observation wells indicated that there may have been some minor influence recorded in the closest upgradient observation well (MW-6D) which is located approximately 6-10 ft north of MW-6R. No drawdown was noticed in any of the remaining observation wells.

24 Hour Pump Test - MW-6

The 24 hour pump test on MW-6R was completed during the period from November 2, 1992 to November 3, 1992. The discharge line and pump were setup identical to the step drawdown test completed on October 30, 1992. The static water level in MW-6R was measured at 5.92 ft. BTOC prior to the installation of the pump. The pump intake was set at 17.25 ft. BTOC. The pump test was started at 1:30 pm on 11/2/92. The pumping rate did not have to be adjusted because the pump was operating at its maximum capacity of 9.2 gpm.

Pressure transducers and dataloggers were installed in a total of 8 monitoring wells to record drawdown: MW-4, MW-4D, MW-5, MW-6D, MW-7, MW-8, MW-12D, and MW-6R. The dataloggers were programmed to record water level readings every 30 seconds throughout the

duration of the test. In addition to the 8 wells equipped with dataloggers, manual water level readings were measured and recorded by field personnel in wells CHT-4, CHT-6D, and MW-6R to provide additional data.

The water level readings for the pumping well and observation wells were collected at the time intervals specified in the G&M workplan whenever possible. Some of the observation wells were not measured at the specified intervals early in the start-up of the test due to manpower limitations. These were the wells which were most distant from the pumping well, where no influence was expected early in the test.

In addition to collecting water level readings, monitoring the pumping rate, and monitoring the operation of the treatment system Geraghty & Miller and SoilTech field personnel completed the following tasks during the pump test:

1. Samples were collected hourly from the discharge line at the wellhead and analyzed for the following water quality parameters; pH, conductivity, temperature.
2. Samples of the influent and effluent were collected every 2 hours. for analysis with the field GC to ensure that the treatment system was operating correctly and to characterize and monitor the changes in concentration levels of the indicator parameters selected for this particular project. The parameters are listed in the summary for the step drawdown test completed on October 30, 1992. Samples collected during the evening were placed on ice in sampling coolers prior to being analyzed by Ken Kanizar of Bingham Environmental.
3. Samples of the influent and effluent were collected every 12 hours for analysis by a fixed- base laboratory (Enseco-New Jersey). A total of four samples (2 influent, 2 effluent) were collected during the 24 hr. test. All sample were sent to the laboratory to be analyzed for volatile organic compounds (VOCs).

The pump test on MW-6R was stopped at 1:20 pm on 11/3/92. Recovery was monitored for approximately 1 hr at which time the water level in the pumping well had recovered to with 90% of the pre-test static water level. There had not been any appreciable rainfall during the 24 hr period of the test so it is reasonable to assume that the static water level in MW-6R at the end of the test would be close to the pre-test static level excluding any unknown outside influences.

The preliminary results would seem to indicate that the aquifer was not significantly stressed during this test. The size of the pump (2 hp) and the 15 gpm limit on the treatment system would make it difficult to maintain a pumping rate much higher then the rate chosen.

A total drawdown of 2.4 ft was measured in MW-6R out of an available drawdown of 11.33 ft. Minimal drawdown (0.06 ft) was recorded in the upgradient Caribbean Hydrotech well CHT-6D. It is expected that there will be drawdown in MW-6D which is located immediately upgradient (< 10 ft.) of MW-6R. The data from the observation wells equipped with dataloggers (including MW-6D) water level data from MW-6D were downloaded onto a computer disk by G&M field personnel and were not evaluated during CDM Federal's oversight due to time constraints associated with the completion of the step drawdown and pump test on MW-6D. Once this data is evaluated G&M will be able to get a better idea of zone of influence associated with this pump test.

Concentration levels for all indicator parameters analyzed by the field GC increased with time in the influent samples. If concentration levels of contaminants are assumed to increase near the source then the results from the GC point toward a source(s) upgradient.

Step Drawdown Test - MW-6D

The step drawdown test on deep well MW-6D was completed on November 4, 1992. The equipment and procedures that were used were identical to the step drawdown test for MW-6R with the exception of a larger diameter pump. The same observation wells used during the previous tests were equipped with pressure transducers and dataloggers, with the exception of MW-8 which was eliminated for this particular test. The water levels were manually measured and recorded in three additional observation wells (CHT-6D, CHT-4, MW-2).

The four step test was started at 2:02 pm. The well was pumped at each rate for a minimum of 30 minutes. Equilibrium was generally reached in the pumping well within a few minutes. Minimal drawdown (0.12 ft.) was observed in the upgradient Caribbean Hydrotech well CHT-6D. The water level in the downgradient Caribbean Hydrotech well rose 0.05 ft. during the test probably as a result of the 0.28 in. of rain measured earlier in the day. The infiltration of rainfall also would have impacted the water level in CHT-6D by reducing the observed drawdown. It is anticipated that there was drawdown in MW-6R since it is located immediately adjacent to MW-6D, but the data from this location was not available before the completion of the test. The following list is a summary of the drawdown for the pumping well, MW-6D, at each of the four pumping rates;

Pumping Rate (gpm)

Drawdown (ft.)

9.8	0.22
12.0	0.29
15.0	0.39
17.5	0.48

The pump was shut-off at 4:20 pm and the recovery in MW-6D and the observation wells was monitored. The recovery test was stopped at 4:50 because the water level in the pumping well had stabilized and had returned to within 90% of the pre-test static level.

After completing the step drawdown test Geraghty & Miller decided that the limited drawdown observed would require that the pump test on MW-6D be run at the maximum pumping rate of 15 gpm which is the treatment system's maximum operating capacity. It was apparent from the step drawdown test that the aquifer needed to be pumped at a significantly higher rate to achieve any reasonable drawdown. It also became apparent that it would not be valuable to run the pump test for 72 hours. Tom Danahy (Geraghty & Miller), Sally Odland (CDM Federal), and Caroline Kwan (EPA-Region II) discussed this issue and EPA approved a 24-hour test on MW-6D instead of conducting the proposed 72-hour test.

The field GC results from the analysis of the water sample found that the initial concentration of the indicator parameters was higher in the deeper well than in the shallow well (MW-6R). Samples were sent to the laboratory to confirm this finding. The samples collected during the pump test will also help to identify trends in the chemical concentrations of the groundwater (ie. does the concentration increase with time, as was the case with MW-6R).

24-Hour Pump Test - MW-6D

The pump test on MW-6D started at 10:30 am on November 5, 1992. The pumping rate selected was 14.2 gpm. The same equipment and procedures used previously were employed for this test.

The pump test was stopped after 24 hours at 10:30 am November 6th. The following two tables summarize the drawdown and recovery recorded in the pumping well and observation wells where manual readings were collected.

<u>Well No.</u>	<u>Drawdown (Max.)</u>	<u>Drawdown (End of Test)</u>
MW-6D	0.22	0.20
CHT-6D	0.14	-
MW-3	0.04	-0.04
MW-2	0.08	0.02
MW-9	-	-0.10
CHT-4	-	-0.15
MW-10	-	-0.20
MW-10D	-	-0.24
MW11D	-	-0.48

Note: The wells showing negative drawdown (ie. rising water levels) are exhibiting influences from rainfall (0.68 in.) during the early morning hours of 11/6/92.

<u>Well No.</u>	<u>Recovery (ft.)</u>
MW-6D	0.41
CHT-6D	0.12
MW-3	0.04
MW-2	0.08
MW-9	0.02
CHT-4	0.01
MW-10	0.01
MW-10D	0.03
MW11D	0.01

Note: The recovery in the pumping well exceeds the drawdown by 0.19 ft. due to infiltration of rainfall.

Initial concentrations of the indicator parameters (BTEX, TCE, PCE, trans DCE, and cis DCE) in influent samples analyzed by field GC were higher in MW-6D than MW-6R but the analytical results exhibited the same trend of increasing chemical concentration with time, suggesting again that a source(s) is located upgradient of the pump test sites. These preliminary results will have to be confirmed by the results from the water samples sent to the fixed-base lab for analysis.

EPA Audit

Laura Scalize and Suzanne Tramontana of EPA Region II ESD arrived onsite to perform a field audit of both G&M and CDM Federal on September 28, 1992. On September 29, 1992, Laura Scalize held a closing meeting for the audit process and remarked she was pleased with the field personnel performances onsite.

PROBLEMS ENCOUNTERED/RESOLVED

Logistical Problems

Drilling operations were slightly delayed on June 2, 1992 as a result of the importation of the drill rigs from Puerto Rico through U.S. Customs. Preparatory activities were conducted while awaiting clearance through Customs. Equipment that had cleared was steam cleaned while awaiting the drill rigs. Drilling began on June 4, 1992.

Due to a local holiday on June 15, G&M was unable to obtain water from the approved WAPA water source. Water was eventually obtained from the same source via a different distribution point. A sample from the new distribution point was collected by G&M and submitted for laboratory analysis.

Rock Drilling Problems

Drilling in the bedrock was initially difficult. Unstable bedrock was encountered at the shallower depths in many deep drill holes, resulting in partial collapse and problems setting casing. After repeatedly reaming MW-1D and MW-4D, G&M, with EPA approval, resorted to grouting the holes to stabilize them, then reaming through the grout to set casing, regrouting the casing, and finally drilling through the casing to the intake interval.

While coring MW-4D drilling fluid circulation problems occurred. These problems were alleviated by flushing the hole to remove some of the silt from the overburden.

Tremmie Pipe Problems

G&M was unable to tremmie grout down MW-4D due to the limited space between the wall of the hole and the casing. Therefore the drillers were instructed by G&M to pump the grout down the hole. At CDM FPC's request the amount of grout required to fill the annular space was calculated. The amount of grout added to the hole was monitored to ensure that a proper seal for the well had been achieved. At CDM FPC's request, G&M arranged for a smaller diameter tremie pipe to be delivered to the site.

Additional Proposed Borings

Borings B-14, B-15, and B-16, which were drilled in the vicinity of the Curriculum Building, were not proposed in the G&M Workplan. On August 14, the EPA and CDM Federal agreed with G&M that the additional borings would yield valuable information regarding contamination in the area of the Curriculum Building.

MW-6S/MW-6D

On August 3 activities were initiated to ream core hole MW-6D for completion as a deep monitoring well. During the reaming operation recurring problems occurred, including the mechanical failure of the drill rig and the collapse of sections of the core hole.

Drill rig mechanical problems included plugging of cuttings, stuck drill rods, and the failure of the drill rig hydraulic system. The failure of the drill rig hydraulic system occurred on August 4. Only a minor amount of hydraulic fluid was released and was immediately cleaned up without any potential impact upon the core hole.

As a result of these problems (which were apparently caused by the existence of loose rock in the core hole) G&M and Soil Tech personnel decided to complete the well as a shallow well to a depth of 24 feet. The shallow well was constructed without properly abandoning the deeper section of the core hole (~24 to 65 feet).

The above well construction problem was reported to EPA by CDM Federal oversight personnel through the CDM Federal Project Manager. The problem was immediately addressed in a conference call between CDM Federal, EPA, and G&M. G&M agreed to remove the improperly installed shallow well and abandon the core hole. The core hole was abandoned by removing the casing and grouting the hole to the surface on September 1, 1992.

On August 6 the installation of a deep well was initiated to replace MW-6D. The B-90 air hammer rig was used to drill to a depth of approximately 45 feet. After drilling to this depth, geophysical measurements were made, casing was set, and drilling resumed to a depth of approximately 65 feet. On September 8, MW-6R was installed to replace the previous improperly constructed MW-6S.

MW-9/MW-9S

The screen installed in MW-9 from 14.1-34.1 feet below ground surface did not end up intersecting the top of the water table. To investigate the presence or absence of free product, a shallow well was drilled adjacent to MW-9 and screened from 8.67-18.67 feet.

B-8

On August 11 an attempt to position the CME-55 drill rig for boring B-8 was unsuccessful. Access to this location was restricted by existing structures at an inclined section of driveway which prevented the positioning of the trailer mounted

drill rig while in tow. The following day this problem was solved by using the rig's own cable and winch system and the water tank truck as an anchor to pull the rig up the incline. The rig's winch was used to pull the rig into the desired position to perform boring B-8. At the completion of this boring the rig's winch was used to ease the rig back down the incline.

Pump Tests

Issues of concern with the pump tests were very limited drawdown observed during the 24-hour pump tests in both pumping wells and observation wells, most likely due to the limits of the stripper system on pumping rates, and the influence of the rainfall on the water levels in the pumping well and surrounding observation wells during the pump test at MW-6D. These issues will make the analysis of the data more difficult and will require careful consideration as to their impacts and the reliability of the test results.

Analysis of the results from these pump tests should be evaluated closely to ensure that all external variables with potential impacts on the test results have been considered (ie. rainfall, barometric pressure, withdrawals from the aquifer by other sources, etc.) especially given the very small amount of change reported in the water levels of some of the observation wells.

It should also be noted at this time that Caribbean Hydrotech will be completing a pump test on one of their wells in the near future. Bruce Green (Caribbean Hydrotech) will be in charge of this particular test. At the time that the G&M tests were completed, the particulars of this upcoming test were uncertain (ie. pumping rate, treatment capabilities, dates, times, etc.). It may be worthwhile for Geraghty & Miller or EPA to try to receive as much data as possible from this test for comparison purposes.

PERSONNEL PROTECTIVE EQUIPMENT USED

All activities were performed in modified level D. Air purifying respirators were carried as contingency, but their use was not required. Drilling operations were observed from an upwind location. Both G&M and CDM Federal personnel conducted continuous air monitoring with HNu photoionization detectors.

FIELD STAFF

Mark Greany, Pam Philip, Andrew Scano, Susan Flakus, Susan Collagan, Bill Holden, and Brian Jenks of CDM Federal provided field oversight of all activities. Clinton Moffet was the site manager for G&M.

APPENDIX

FIELD LOGBOOK NOTES

TUTU WELLS SITE
JUNE 2 THROUGH NOVEMBER 6, 1992

ROCK
+ Strength / Hardness

Exposed
Right
Dyke on
your left

DATE

* Core Orientation

5 min a ft
0.001 0.1
0.1-0.5 ft
0.5-1.0
1.0-3.0
+ 6 feet

* Core Recovery
- percent of the interval
that produced recovery
(actual footage)

* RQD (Rock Quality Design)

Extremely altered - Saprolite
Highly altered
Slightly altered
Unaltered - Fresh

6/2/92 Mark Greaney

0730 On-site at Texaco
at junction of Rt 38 & Rt 384
Spoke w/ Mr. ~~Marjan~~ (MARVIN)
in Service SI Office to confirm
that he expects Geraghty &
Miller & drillers today.

Weather

Clear & warm & humid
the ground is wet from
last night's rain.
breeze variable 0-5 K

Mentoring Instrument:

Altek portable PID (photo-ionizer)
model PI 101 w/ 107 eV probe
cleaned & calibrated 5/20
by JD of H93-co (800) 332-0435
serial # 1201 09

0845

G & M still not on site
tried calling G & M field trailer -
received fax signal
tried calling G & M apt. - no answer
phoned FPC - NY - Sally not in yet.

Mark Greaney

② 6/2/92 (cont) Mark Greany

0845 cont. MARVIN ~~NO~~
spoke w/ Mr. ~~Morgan~~ again
he definitely expects GFM
today or tomorrow?

0900

Clinton Moffet arrived on site
following Clinton to GFM
field office for kick-off
health & safety meeting

0930

Met project manager Tom Danahy GFM
project manager Jose Agrelo Soil Tech
bi-lingual H&S meeting conducted
all drill crew personnel attend

1130

Health & Safety meeting is completed
breaking for lunch
will steam clean rigs
and de-con split spoons later
this afternoon after rigs
clear customs - approx 2 pm?

1400 ~~NO~~

Back on site Rigs have not yet
cleared customs.

Mark Greany

• 6/2/92 (cont) Mark Greany

③

1500

- Site history/wells discussed w/ Tom D.
- NO decon will take place today
- NO site activities conducted
- finished for the day

~~Mark Greany~~
~~6/2/92~~

• Mark Greany

④ Mark Greany 6/3/92

0800 On site at Tenaco
Some soil tech trucks have
cleared customs but
Rigs have not yet cleared.
HNA is not functioning
power source problem

0900

going to call office
weather today:

~~hot~~ warm, cloudy,
occasional light sprinkles
of rain - clouds
breaking up - intermittent
sunshine. Breeze - light
variable @ 5, will probably
build to a steady
breeze later in the day

0945

spoke w/ Sally re: HNA
send back to Haseo
Windsor Industrial Park
Route 130 Bldg 12
Windsor NT 08561 attn Tony
Fax # 1283-7540-6
7255-048-C81-1DRO

Mark Greany

6/3/92 Mark Greany ⑤

Note - Clinton informed me
that WAPA (Water & Power Authority)
Supply water was sampled

February 92

Analytical results are
presented in

5th Sampling Report

This water comes from a
pipeline from a sea water
desalination plant.

1200

Breaking for lunch

1300

return from lunch

rig on site at Tenaco

tank trailer being filled at WAPA

1500

steam cleaning:

small trailer tank 550 gal

large flatbed tank 1200 gal

drill rods

split spoons

etc

Area has been roped off

with caution tape.

Mark Greany

⑥ 6/3/92 Mark Greany

1700

still steam cleaning
drill rods & other equipment
Preparing to de-con split spoons
Decon procedure 8 steps:

- 1) soap & water scrub
- 2) tap water rinse
- 3) 10% nitric acid
- 4) tap water rinse
- 5) Methanol
- 6) Hexane
- 7) deionized water
- 8) Air dry / wrap w/ alum foil

1800

Finished De-con of spoons
breaking for day

~~Mark Greany
6/3/92~~

Mark Greany

Mark Greany 6/4/92

⑦

0700

At G+M Field office

w/ Tom Danahy

Clinton Moffet

Rubin Ponciano

Wanda Morales

G+M

Drilling scheduled to begin today
Rubin Ponciano will lead the
drilling at MW-1D

Wanda Morales will lead the
drilling at MW-4D
see location map last page
of this book.

Weather: warm clear light breeze
looks like it will be strong sun
all day today.

0800

On site at Teraso

now steam cleaning large rig

G+M monitoring instruments

2 HNu photo-ionizers #101363/A01052

w/ 10.2 eV probe

2 Tan Y-Techtors explosive gas meter

506539 / 506545

both from Linc Quantum Analytics

FOSTER CITY, CA

Mark Greany

⑧ 6/4/92 (cont) Mark Greany

0930 Drilling begins at
MW 4D

augering to bed rock after
continuous split spoon samples

Split spoon # 1

depth 0.7 - 2.7
blow count 9-12-3-3
recovery 1.3 ft Silty Clay
H₂Nu borehole bkgnd (0 ppm)
H₂Nu sample bkgnd

Split spoon # 2

depth 2.7 - 4.7
blows 3-4-4-4
recovery 1.5 ft Silty Clay
H₂Nu bkgnd (borehole)
H₂Nu bkgnd (sample)

SS # 3

depth 4.7 - 6.7
blows 1-2-2-5
recovery 0.9 ft Silty Clay
H₂Nu borehole Bkgnd
H₂Nu sample Bkgnd
Mark Greany

⑨

SS # 4

depth 6.7 - 8.7
blows 7-11-16-16
recovery 1.3 Silty Clay
H₂Nu borehole bkgnd
H₂Nu sample bkgnd

SS # 5

depth 8.7 - 10.7
blows 9-34-38-36
recovery 1.7 ft
H₂Nu borehole
H₂Nu sample

SS # 6

depth 10.7 - 11.7
blows 50-60 spoon refusal 11.7
recovery 1.75 ft
Silty clay to weathered rock
H₂Nu borehole bkgnd
H₂Nu sample bkgnd
weathered rock begins at 9.5 ft

Now augering in weathered rock
augers are grinding at 11.7 ft.

SS # 7

depth 12.7 - 13.7
60 blows to advance 0.45 ft

Mark Greany

⑩ 6/4/92 Mark Greany

SS#7(cont)
weathered rock

H₂N₂ borehole Bkgrnd
H₂N₂ sample Bkgrnd

SS#8 13.7 ft - 14.0 ft
50 blows - 0.8 ft recovery
weathered rock
H₂N₂ borehole Bkgrnd (0.2 ppm)
H₂N₂ sample bounced a
slight deflection
to 0.5 ppm
momentarily

SS#9 14.7 - 14.9
taken after angling to 14.7
50 blows 0.2 ft weathered rock
0.2 ft recovery
H₂N₂ borehole Bkgrnd
H₂N₂ sample Bkgrnd

auger down to 15.7 ft

SS#10 15.7 - 16.1
50 blows 0.4 ft

Mark Greany

Mark Greany 6/4/92 ⑪

SS#10 cont
recovery 0.6 ft
H₂N₂ borehole Bkgrnd
H₂N₂ sample Bkgrnd

auger down to 16.7 ft

SS#11 16.7 - 16.9
no recovery
split spoon is wet
WATER encountered 17.3 ft
(approx)
H₂N₂ borehole Bkgrnd
H₂N₂ sample Bkgrnd

angling down to 18.7 ft

SS#12 18.7 - 18.8

50 blows 0.1 ft
recovery 0.4 ft grey silty clay

G&M does not collect samples
for GC analysis after
encountering water

Mark Greany

(14) 6/5/92 Mark Greany

0730 Onsite at Texaco
cuttings collapsed MW-4D
to depth of approx 18 feet
(ie ~ 10 ft of cuttings
in hole) Hole will be
flushed w/ recirculating
water this ~~am~~ MB
morning to remove cuttings.

At MW-1D site
Test hole is being sealed
with cement.
Rig will be repositioned 5 ft.
Today a split spoon
sample will be
collected from this
location (for lab analysis)
1st Spoon will be used
to collect soils for lab
analysis. Test hole encountered
bed rock at approx $2\frac{1}{2}$ feet.
This area is covered with
approx. 6 inches of asphalt
underlain with gravel.
Will auger through asphalt/gravel
Mark Greany

Mark Greany 6/5/92 (15)

before driving split spoon.
1000

At MW-4D

first core being removed
interval 24.0 to 25.0 feet
broken stones on top 8 inches
solid piece of core last 4 inches
Solid piece of core has
artificial fracture in it
along top to bottom axis
(fracture has slight oxide
staining - natural fracture)

1045

Core removed since bit
was plugged (water not
circulating.) 2 foot core
25.0 - 27.0
broken stone at top 1" - $1\frac{1}{2}$ " pieces
These stones are most likely
cuttings from above that fell
down hole. MB
Recovery 1 foot 8 inches 1.6 ft
of competent rock.
fractures at 25.4 and
26.1 feet

Mark Greany

(12) 6/4/92 Mark Greany

Auger down to 20.7 ft

SS #13 20.7 - 20.8

50 blows 0.1 ft
No recovery

hard augering down to ~21 ft

SS #14 22.7 ft - 22.8

50 blows 0.1 ft
No recovery

Augering down to 24.7 feet

pulling augers to install
pvc temporary casing
8 ft section installed
and grouted, approximately
1 1/2 feet of casing above
ground surface.

1830 breaking down de con area
cleaning up for the day

Mark Greany

Mark Greany 6/4/92 (13)

Test hole installed in the
area of MW-ID but
no actual work done on
MW-ID today.

Test hole performed to
check out air percussion
hammer system with
manufacturer representative
on-site. Mike Hanson - soil tech
trainer
Bed rock (weathered)
encountered (up the hill)
at MW-ID area
at depth of only a few feet.
Test hole will be grouted
closed today. MW-ID will begin tomorrow.
Done for the day

~~Mark Greany
6/4/92~~

Mark Greany

①6 6/5/92 Mark Gueary

MW-4D cont.

core from 25-27 cont
fracture at 25.4
is along calcite fracture
appears to be artificial
drillers fracture no
fracture at 26.1 appears
to be natural fracture
some weathering and
iron-oxide staining

core from 27-30
no recovery

Returning to MW-1D

1130

Angered down 1ft through
asphalt & gravel.

Then advanced spoon from
1.0 to 2.5

44-26-50 blows

sample collected from this
interval. MW-1D (1.0-2.5)

2nd spoon refusal 50 blows/3 inches
Mark Gueary

Mark Gueary 6/5/92 ⑦

~~Core MB~~

Returning to MW-4D
Summary of coring

interval	time
25-25	937 - 942

25-27	1030 - 1038
-------	-------------

27-30 *	1054 - 1102
---------	-------------

(* no recovery)

30-35	1120 - 1146
-------	-------------

drilling stopped due to difficulty
retrieving core.

1230

At G4M field office

Dan Bingham, sub to Soil Tech
running portable gas chromatograph
hits detected in samples
taken from MW-4D
see next page

Mark Gueary

⑮ 6/5/92 Mark Greany
Summary of GC (portable) analyses
at MW-4D

interval	hits
0.7-2.0	ND
2.7-4.7	ND
4.7-6.7	CIS Benz TCE TOLU mB
CIS Benz TCE TOLU PCE ethyl Benz	mB
34 6 12 14 1	mB

INTERVAL (all below in ppb)
4.7-6.7
CIS-34; BENZ-6; TCE-12; TOLU-14
PCE-BMDL; ethyl Benz-BMDL
same compounds at intervals:
6.7-8.7
8.7-10.7

highest hit 38 ppb CIS (6.7-8.7)
(all above in ppb)

~~see sum mB~~

sample from 8.7-10.7 will
be sent for lab analysis

Get copy of these results

Mark Greany

6/5/92 Mark Greany ⑰
Finishing up for day
MW-4D drilled to depth of ~35 ft
Summary of MW-4D

interval	SS#	core run	interval
0.7-2.7	1		
2.7-4.7	2		
4.7-6.7	3		
6.7-8.7	4		
8.7-10.7	5		
10.7-12.7	6		
12.7-13.7	7		
13.7-14.0	8		
14.7-14.9	9		
15.7-16.1	10		
16.7-16.9	11		
18.7-18.8	12		
20.7-20.8	13		
22.7-22.8	14		
average to 24.7			

← weathered rock begins
at 9.5 ft
water table
at 11.2 ft mB

1	24.0 - 25.0
2	25.0 - 27.0
3	27.0 - 30.0
4	30.0 - 35.0

Mark Greany

(20) 6/5/92 Mark Greany

Friday PM
summing up of week
drilled MW-4D to 35 feet
augered to 24 m3
cored to 35
took sample MW-4D (8.7-10.7)
bored MW-ID to ~3.0 feet
augered to ~3 feet
took sample MW-ID (1.0-2.5)
done for day/week

~~done for day/week
6/5/92 Mark Greany~~

Mark Greany 6/5/92

Mark Greany 6/8/92

(21)

On Site at Texaco 0930
received exchange HNU
from HAZCO.
HNU # 1149
H.7 ev probe
fully charged
background =

Coring continues at MW-4D
Coring will not be performed
at MW-ID since large
ris does not go to
sufficiently high rpm's.
Thus large ris is being
stream cleaned in
anticipation of augering
at location B-4

B-4 will be a boring to
bedrock. See location map
taped into back of this
logbook.

Mark Greany

(22) 6/8/92 Mark Greany

CORING NOTES MW-4D

RUN	interval	time (min)	rate (ft/min)	recovery (ft)
1	24.0-25.0	5	0.2	0.65
2	25.0-27.0	8	0.25	1.7
3	27.0-30.0	8	0.375	Ø
4	30.0-35.0	26	0.19	Ø
4A*	27.0-32.0	-	-	-

*4A performed to clean out hole (water plug occurred)

All above performed 6-5-92

core notes continued:

6/8/92

run	interval	time (min)	rate (ft/min)	recovery (ft)
5	32.0-33.0	39 min	1/39	0.9
5	32.0-33.0	39 min	1/39	0.9
6	33.0-35.0	9	0.22	0.9
7	35-37	20	0.10	0

Still having difficulty w/ recovery due to plugs & core pieces that are stuck in core barrel.
Mark Greany

6/8/92 Mark Greany (23)

Tripping out rods to change diamond bit at 37.1 ft. hole will then be flushed.

Steam cleaning large rig at location B-4. No further work on MW-1D. A third rig capable of sufficient rpm's to core in rock will be sent from Puerto Rico. and should arrive approximately 2 weeks from today, considering "customs" delay time.

Coring resumes at MW-4D after changing bit & flushing hole also delayed by small rain storm

run	interval	time	rate	recovery
8	37.1-40.0	20	0.14	2.35 ft
9	40.0-45.0	30	0.16	5.1 ft

37.1-40.0 2 drillers breaks
40.0-45.0 4 "fractures"
only 1 appears to be water bearing at 41.2 ft.

Mark Greany 6/8/92

(24) 6/9/92 Mark Greaney

0800 On site at Texaco
boring w/ augers / split spoon
Sampling at B-4

SS#	Interval	blows	H _{Nu}	material
0	0-0.5	auger thru		Top surface
1	0.5-2.0	23-31-32		bgnd * clay
2	2.0-4.0	7-15-17-?		bgnd * clay
3	4.0-6.0	4-21-21-17		0.1 clay / little sand
4	6.0-8.0	32-50-34-40		0.3 clay
5	8.0-10.0	12, 23, 29, 21		0.1 clay

* bgnd H_{Nu} = 0.1 ppm

Stopping to repair winch

0930

Coring continues at MW-4D

run	Interval	Time	rate	recovery
10	45-50	24	0.21	4.85 ft
11	50-55	23	0.20	5.0 ft
12	55-58.3	4#3	0.08	

SS# 10-12 ft 37, 50, refusal @ 1 H_{Nu}
soil sample taken (bgnd)

at this location

from depth 8 ft - 10 ft

B-4 (8-10) sample label

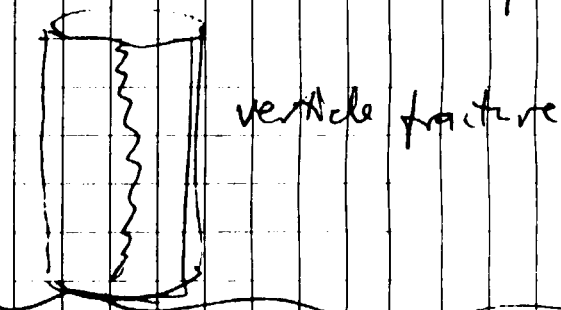
Mark Greaney

Mark Greaney 6/9/92 (25)

spoke w/ Tom Tanahy re.
fractures in run 9
Tom thinks 3 of 4 are
water bearing

fracture	water bearing
40.4	NO - driller's break
41.2	yes - good weathered
43.1	yes - slight weather
44.3	yes - slight weather

note also 41.2 fracture
orientation is more verticle
than most other fractures



1000 removing run # 11
Stopped short of full 5.0 ft run
due to circulation problems.
Correction - full 5.0 ft
recovered. 6 fractures

(26) 6/9/92 Mark Greany

run 11 (cont.)

fractures	description
50.6	drillers
50.85	drillers
51.1 MB	slight weathered
51.4 - 52.0	vertical - weathered
53.7	drillers
54.5	very weathered

1400 drilling MB

Coring run #12
stopped at 58.3 feet
pressure increased
stopping, pulling rods to
relieve pressure / plug
Jose Cardona - Soil Tech

Supervisor
Jose says a clay-weathered
rock zone has been encountered
at approx 57 feet.

B-4 complete
will be grouted up later
stem cleaning all equipment
used to perform boring B-4
Mark Greany

Mark Greany 6/9/92 (27)

1430

still tripping out rods to
try to solve drilling fluid
pressure problem.
Core from 55 ft on has
not been retrieved.

1435 Core is retrieved
from outer rod after
tripping out all.
full recovery all rock
disregard Jose Cardona
comment previous page.
It does not appear that
we drilled through a
weathered zone and
no clay here in this
recovered core.

This core is pretty well
bitten up by the rig
and retrieval.
Two sections are fragmented
and 2 fractures
one fracture only slight
weathering. The other is
a drillers break.

Mark Greany

(28) 6/9/92 Maul Greasy

Core run # 12

55.0 - 58.3

55.1

~~56.0~~ ~~56.2~~ ~~MB~~ 55.7 - 56.0

~~57.5~~ ~~57.8~~ 56.9 - 57.3

~~58.2~~ 57.7

~~MB~~

55.1 weathered (slight)

55.7 - 56.0 weathered (more)

56.9 - 57.3 drillers

57.7 weathered (slight)

1500 Augering begins at MW-3
augered through 1st 6 inches
of concrete preparing to hammer
split spoon #1.

MW-3 located in back of
Texaco station near

garage, also near a
drum storage area.

Drums used to store used
motor oil. N 50 x 55 gal drums

Maul Greasy

Maul Greasy 6/9/92

(29)

Split Spoon Interval MW-3

0.5 - 2.0

spoon refusal

blows: 27, 48, 50

now augering

auger refusal at 2.4 feet

sample taken at this

location MW-3 (0.4 - 2.0)

field blank, trip blank prepared

all sent to Puerto Rico

w/ soil tech personnel

to walk sample through customs.

Now setting up rig to

use hammer the rest of this

shallow well - coring only

performed for deep wells.

The hammering of MW-3

will commence tomorrow.

~~MW~~ MB

1700

still experiencing water circulation

problems at MW-4D. Water

is being changed due to high

level of sticky silt in water

(30) 6/9/92 Mark Greany

MW-40 cont

		(min)	(ft/min)	(ft)
Core run	interval	time	rate	recovery
13	58.3-60.0	12	0.14	1.3
14	60.0-65.0	34	0.15	4.5
15	65.0-68.0	25	0.12	3.5

13 58.3-60.0

58.5-58.8 weathered fracture
rest of core is solid

14

60.0 - slight weathered
60.4 - drillers
60.3 - drillers
61.8 - slight weathered
62.4 - drillers
63.1 - drillers
63.7 - 64.5 - MAJOR FRACTURE
Totally different material
water bearing zone
brownish, highly friable material
as opposed to tough grey/blue rock
Mark Greany.

6/9/92 Mark Greany (30)
1900 last core at this
hole retrieved.
65-68 feet

66.5-67.0 major fracture
continued. material hardens
up in middle of this section
from 63.7-67.0
hard in middle
friable at top and bottom
6-8 inches

67.0-68.0 - back into
competent rock - same as
previous blue grey hard rock.

Done for day

Mark Greany 6/9/92

(32) 6/10/92 Mark Greany

0730 On site at Texaco

Weather - same as always
hot, humid due to rain overnight
slight breeze, intermittent clouds

Preparing to log MW-4D

Air hammering MW-3

hammering to depth of 30-35 ft
hammering stopped to install
proper sized rod-clamp

09

0930 hammering has resumed
now down ~15 feet
air hammer hole diameter
is approximately 8 inches

1155 16.9 depth to water at MW-3.

1300 MW-3 air hammered
to depth of 34 feet.
Sounded w/ tape to 33.4
(some material settled/collapsed)
depth to water 16.4 ft

Mark Greany

6/10/92 Mark Greany (33)

MW-3 will be screened
from 11-31 feet w/
~~stainless steel screen~~ 20B
will be screened
from 10.5 to 30.5 ft.
w/ 0.002 slot stainless steel

MW-4D

reaming/cleaning hole
w/ small 2 15/16" tricone
bit. Should not
affect sides of the hole.
Jose Cardona of Soil Test
assures me that tricone
bit will not affect
sides of the hole prior
to logging w/ calipers
and sonic instrument.

1530

Completed 2 runs of
caliper logging at MW-4D
now preparing to run
a sonic log.

Mark Greany

(34) 6/10/92 Mark Greany

1700

still running sonic core log
Drillers have all left the site
for the day.

1900

making adjustments to sonic core
'centralizers' - sonic core
instrument is ~~not~~ going down
hole very ~~fast~~ slowly.
Centralizers are thought to be
impeding descent.

~~Mark Greany~~
6/10/92

Mark Greany

6/11/92 Mark Greany (35)

1800 On site at Terrace
just completed a review of
my drilling notes.

MW-4D will be reamed today
setting up for that now

MW-1D will be cored today
decommissioning coring rig now

B-4 is complete & grouted shut
MW-3 is ready to be screened
and flush mount installed.

Flush mount now complete
(screened yesterday)

1000 light rain falling intermittently
steam cleaning of small rig
(coring rig) now complete
mobilizing to MW-1D location

1100

augering through surface to rock
at same spot where prior
augering performed and sample
taken. (MW-1D)

1200 breaking for lunch

Mark Greany

(36) 6/11/92 Mark Greany

MW-ID

core	interval	time	rate	recovery
1	2.5-5.0	14	0.18	1.3 ft
2 ^{MB}	5.0-10.0	15 ^{MB}	0.31	2.3 ft
3	10.0-15.0	19	0.26	1.8 ft
4	15.0-19.5	36	0.13	4.4 ft
4A	19.5-20	4	0.13	0.45 ft
5A ^{MB}	20.0-21.2	7	0.17	0.85 ft
5A	21.2-25.0	22	0.24	3.8 ft
6	25.0-30	45	0.11	5.0 ft
7	30.0-35.0	38	0.13	4.6 ft

6/11/92 Mark Greany (37)

MW-ID core run #1

broken pieces at top of core 3"
solid piece of blue/grey rock 1 ft
fractured rock remaining 4"
2.5 - broken pieces
2.6-3.5 solid blue/grey rock
3.5-3.8 - weathered verticle fracture

1300 drilling core run #2

2.3 ft recovery

rig proceeded quickly
from 6-8 ft

possible unconsolidated
zone 6-8 ft.

recovered core:

top solid piece 1.2 ft
broken pieces 2 1.2-1.5
broken piece 1.5-1.8
chipped piece 1.8-1.9
solid piece 1.9-2.3
pieces all appear weathered
may be effect of rig

Mark Greany

(38) 6/11/92 Mark Greaney

1320 haul coring run #3
losing water down hole
rig ran fast
through 12-13 - 14 ft interval
14-15 proceeding slowly
recovered 1.6 feet

~~0.0 - 0.2~~

fractures at

0.0 - eroded by rig

0.2 - drillers break

0.6 - slight weathered

0.9 - tight break slight weathering

1.6 - very weathered

1330 back down hill to MW-41
uncovering w/ large diameter 8 1/4" ID
auger complete to 20 feet
auger refusal at this depth
now preparing to hook up
compressed air hammer to
ream hole.
casing will be installed
to approx. 48 ft.

Mark Greaney

6/11/92 Mark Greaney (39)

Return to MW-1D
retrieved core run #4

~~2.8 ft recovery~~

~~0.0 - shipped small piece~~

~~1.4 - drillers break~~

~~2.4-2.5 weathered fracture~~

~~2.7 - another ZIB~~

~~2.6-2.8 weathered fracture~~

~~different orientation from above~~

Core #4

4.4 ft recovery

0.0 - weathered fracture

1.3 - drillers break slight weathering

1.6 - weathered fracture

3.0 - drillers break

4.1 - weathered fracture

4.3 - weathered fracture

different orientation
from fracture at 4.1

Mark Greaney

(40) 6/11/92 Mark Greany
1445 ~~beginning run #5~~
beginning run #4A

to obtain $\frac{1}{2}$ ft
interval from 19.5 - 20.0 ft
Stopping due to lack of water

Notes on 4D
major fractures at
33 - 37.1 ft
and 63.7 - 64.5 - 67.0

1500
air hammering begins at MW-4D

1600
Surge of air forces water/mud
up from hole and soaks
drillers, cleaning up now.

1600 at MW-1D

run #4A retrieved 1 piece
weathered fracture along top 3"
weathered fracture on bottom

Mark Greany

7/11/92 Mark Greany (40)
run # ~~5~~ ^{5 mg} ~~SA~~ - 1 piece
weathered on top & bottom

WATER encountered at this
location at ~ 15 feet.

Run SA from 21.2 - 25.0
last run for the day.
Approximately 1000 gallons
used up (down hole) today.

1730

At MW-4D

water is still periodically
issuing from hole
with a lot of pressure.
Hammers down to ~ 50 feet.

1830 Air hammer is down to
48 ft at MW-4D. Rods tripped out.
Stopping for day

~~Mark Greany~~

Mark Greany 7/11/92

④② 6/12/92 Mark Greany

0800

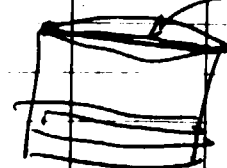
preparing to set 6" casing
in MW-4D to 48 feet.

The remainder of the
hole will be open.

Open section will be
air hammer reamed out
after casing sets over
the weekend.

Air for drilling supplied by
Atlas Copco PTMS-900
100% Oil Free Air

Having problem installing casing
PVC threaded section was
to be used to lower sections
but threads are wrong size



BAR for hook

PVC section

Mark Greany

6/12/92 Mark Greany ④③

MW 1-D

21.2 - 25

0.0 - weathered on top
2.8 - weathered fracture
above 1/4 inch thick
calcite deposit on
top of next piece

2.8 - 2.9 vertical fracture
runs the length
of this piece

2.9 join 3.1 down
3.5 weathered fracture
weathered fracture

25 - 30

0.0 - slight weather
1.5 - drillers
3.2 - slight weathered (drillers)
3.2 - slight weathered
4.1 - 4.4 - friable material
4.9 - weathered
above another thick (1/4")
calcite deposit.

(44) 6/12/92 Mark Greany

30-35

~~30.0~~ mg

0.0 weathered (1/4" calcite on top)

0.6 weathered

1.1 } friable & weathered

1.2 } weathered

1.9 slight weathered

2.3 - weathered

4.0 - weathered

4.6 - weathered

4.8 - weathered & friable

Mark Greany

6/12/92 Mark Greany (45)

35-40

0.0-0.6 friable crumbled

1.1 weathered

2.3 slight weathered

2.8 slight weathered

3.6 slight weathered

major water bearing
portions:

~ 29.1 - 29.4

~ 35.0 - 35.4

less significantly friable

~ 32.0 - 32.3

1100 new drilling
core run # 8
40-45 feet

~~1200~~ for mg

1130 - going to field office
to copy log book

Mark Greany

(46)

(200)

9/12/92

Mark Greamy

finished for week
preparing to return to NY

~~Mark Greamy~~

6/12/92

6/15/92

Janice Philip

(47)

9:30 MW-ID at PSP DSP
arrives on site - GFM installing
well MW-4D - PSP at MW-ID
where coring continues. Currently
at a depth of 47' water level
at 29.2

10:00 MW4D - Currently installing
well - Open hole well 47-67'
Installing stainless steel casing
Water level in hole - MW4D
10:15 Meet w/ Clinton Moffatt
for site specific HNS

10:43 Return to MW4D
Coring in progress - This
well will be cased to 84' bgs
Having difficulty installing MW-ID
Casing stuck at 30' - Remove
casing -reaming out hole again
and will try again to set casing

11:25 @ 30' Reaming - 100%
6012 core - No evidence of fracture
zone

12:20 At MW4D have reamed
out hole and is in the process
of installing casing. Pushing,

Pan Philip 6/15/92

(48)

Lamela J. Philip 6/15/92

resisting to depth

GTM having difficulty obtain water from designated source due to local holiday
 GTM has found that water from the same source (WAPA) is available from another distribution point. This has been documented GTM will collect sample and will submit to field GC and analytical laboratory for analysis to check quality from this distribution source

1340

@ 55' - Almost 100% recovering from 50-55' fracture zone at ~ 52'

Drilling here at MW4D has stopped due to loss of water - Tank truck will be refilled - Construction of MW4D has also stopped due to lack of water

1500

GTM / seek tech at well MW4D

Lamela J. Philip

6/15/92

(49)

Lamela J. Philip 6/15/92

unable to tremmie grout from surface - Tremmie pipe will not fit below casing / larger diameter required
 CON EPC has questioned efficiency of the alternative method which was chosen - That is to pump grout from surface
 This is difficult to measure if grout is sealing properly, w/o bridging or loss. GTM has decided to measure grout as it is pumped and will monitor amount

1510 It has been calculated that 100 gals of cement grout + bentonite mixture be added to fill in annular space

1533 At MW4D - Casing was resumed - @ 56.5' At MW4D - up to 60 gals pumped down

1630 At MW4D - ~ 100 gal pumped into annular space
 Additional grout mixed - Upper 20' Larger diameter hole 14"

Lamela J. Philip

6/15/92

(50)

6/15/92 Sam Philip

as opposed to 7" down below
Calculations based on
12" as opposed to 14"

Additional grout required

on top of 105 estimation

At MWID - @ 60' 59.5'

No apparent fracture

Zones -

6AM has lost plumb

bob

730

Recover plumb bob - Drilling
has stopped for day at

MWID

PSP leaves site Saturday

Sam Philip

6/15/92

(51)

6/16/92 Sam Philip

745 PSP arrives on site

weather - Sunny, very warm & dry

At MWID - coring has yet to
begin - @ 59.5'

MWID - grout is down 8 ft bgs

6AM will be with final batch

of grout - Drillers have stated

that tremmie pipe will be

obtained so this situation

can be avoided in the future

Upon completion of grouting

hole will be returned to

remaining depth after 24 hrs.

How used by CM+PC

HAZCO #1149

MWID - Water level @ 62' - down

from 29. from

6AM sent 1.0 sample

from New water source called

"Firehouse WAPA"

910 grouting complete at MWID

= 175 to 181 gals - 67 more

gals than previously figure (108)

This due to previous amount

derived on 12" hole as opposed

(52)

6/12/92

Ann Miller

to 14'

Drilling will begin
at shallow well MW-4
after decon is completed

MWID - coring is
still in process @ ~64'
Water is being lost in
hole

9:30

Coming to 65' complete
100% recovery

Weathered fracture slight
@ 64.5

10:05

Begin coring 65-70'
interval

11:00

At MW-4 begin drilling
shallow well

11:25

Collect 1st split spoon

0.7-2.7 - fill-gray-green silt

silty clay - some sand
gravel

2.7-4.7 - 4ppm HNU

dark brown clay (silty)

w/ greenish streaks

top 4" silty sand clay some
gravel + some to 6.5' HNU

6/14/92

Ann Miller

Ann Miller

6/14/92

(53)

11:07-67 3ppm 1.2' Recover

12:20 At MWID

65-70 Interval - No apparent fracture

RCD = 9.0

Currently drilling 74-75'

13:30 At MWID

6.7-8.7 NKA

Brown - dark gray clay
w/ some gravel + sand

8.7-10.7 - NKA

No recovery @ 8.7 - Drillers
will go to 12.7 and try
again

Loadings down hole 3ppm

Water level in MW4 @ 7' bgs today

6M soil tech unable to

split spoon any longer - weathered
bedrock - Will you digger drill
to depth of well which is @ 27'

Screened interval from 7'-27'

MWID 70-75 interval

No apparent fracture zone

RCD = 7.4

Recovery 3.75

14:00 6:15 PM has prepared to drill MWID

Ann Miller 6/14/92

(54)

Ann Philip 4/14/92
to 85' and complete
boring as open hole from
65-85 - CDM APC
has pointed out that
there have been no
water fracture zones in
the 65-75' zone and
has asked Gtm how
will this affect the
completion of their well?

At MW 4^{PSP} drilling
w/ air hammer has begun @
MW 4 - will drill to
total depth $\approx 28'$

1500

In the process of
coring 75'-80' interval

@ MW 1D

1515

@ MW 4 - Air Rotary in
action down to ~~20'~~ 27'
27' - Soil is moist

1530

Compressor down @ MW 4
Drilling will resume when
compressor is fixed

1600

Coring 75-80' @ MW 1D
complete

Ann Philip 4/14/92

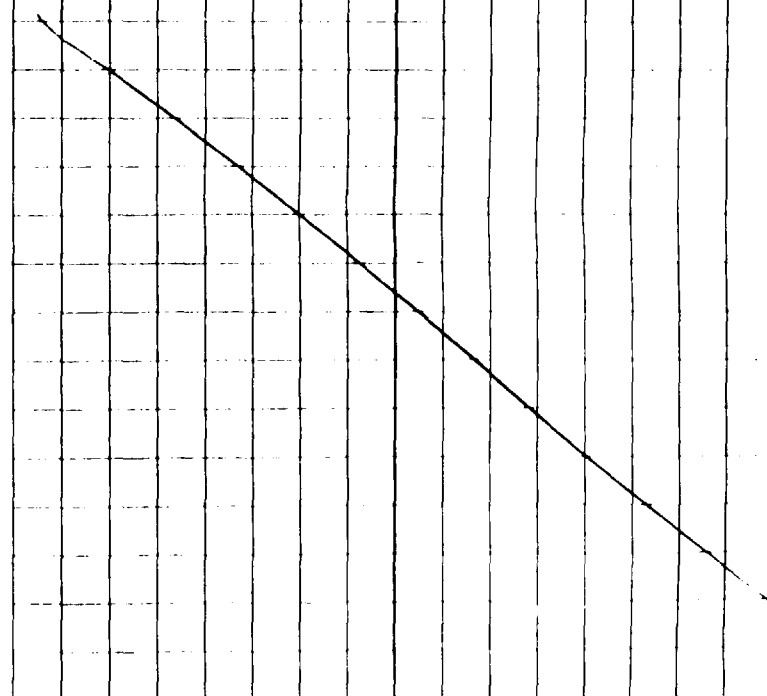
(55)

Ann Philip 4/14/92
1615 Complete 75-80' interval
@ MW 1D - same rock as above
- No apparent fracture zones
flow will

1630 Begin coring 80-85' interval
1800 Fracture zone @ 82.5' slight
weathering

Fracture zone @ 83.5' slight
weathering

1830 PSP leaves site (for clear)



Ann Philip

4/14/92

(56)

730

6/17/92 Jim Haley
P&P arrives on site
Weather today, SUNNY
Hor ~~x~~ 850

AT MWID - Down to
84' - Water truck is
being filled

AT MW4 - The compressor
is still unoperational
It is projected that
compressor should be
fixed early this morning

800

AT MWID - Coring
begins 84-89' interval

830

AT MW4 Water level
120.9'

Sounded MW4 to depth
of 23.9

900

AT MW4 - installing
SCREEN

Screened interval 27-7'

Casing - 7' ↑

SAND Pack to 5'

SEAL to 3'

Went to surface

945

AT MWID - coring of

6/17/92 Jim Haley

P&P Completion

6/17/92

(57)

P&P

84-89' complete

Weathered fracture ^{was} ~~is~~ ^{at} ~~the~~
Well will be completed as open
hole w/ open hole interval
from 69' to 67' ^{Range}

1045 AT MW4 - Cement added
to well - being hydrated 3'
seal - will go out to surface

AT MWID rods being
pulled out - geophysical logging
scheduled next

1300 Some obstacles in
MWID borehole - hole must
be reamed w/ tricone bit
prior to logging. Drillers
now setting this up

AT MW4 - Drillers setting
up to ream MW4 to depth
of 67' Well completed as
open hole from 47-67'

1320 Begin reaming MW4

1340 AT MW4 - Logging

reaming out 47-67' interval

1450 AT MWID - Reaming
will then be completed

6/17/92 Jim Haley

(58)
1618

6/17/92 Ann Piller
Drilling of MW4D is complete - Drilled to 90' after setting it is anticipated actual well depth will be 68' - Well still needs to be grouted to surface as does MW1
This will be done after Pinks are pulled out

LatM still having problems reaming out MWID to facilitate lowering of geophysical equipment.

Both wells have been grouted to surface - both need protective caps.

1630 LatM sounds MW4D - Total depth 70.71'

1640 LatM going to 25' w/ drill rods - LatM will clean hole w/ tricon bit again tomorrow
Geophysical equipment will then be sent downhole

1700 PSP leaves site for day

6/17/92 Ann Piller

(59)

6/18/92 Pamela Piller
120 PSP arrives on site

At MWID - LatM is still reaming out the hole so geophysical equipment can be lowered downhole

At MW4D/t - Crab boxes are being completed

1000 At MWID - Reaming w/ tricon complete

Weather today is fairly cloud, humid, hot ~ 89°

1030 LatM has reamed out and cleared out hole to depth

Other rig has completed decen and will be moving to MWID to ~~start~~ ream out hole to 109' and to set casing

Coring rig will go to decen and will later set up on MW13D @ VHA

1105 Begin geophysical logging
1st Run - caliper to 79'
2nd Run - caliper to 86'

1310 At MWID - Air Reaming machine preparing

6/17/92 Ann Piller

TUT 005 2213

(100)

6/18/92 Am Pilep
to ream out hole
to 69'

CME (Coring Rig) is being
deconned

1430 Begin reaming w/air hammer
@ MW1D

1530 Still Reaming MW1D

@ $\approx 35'$ to 20'

CME Coring Rig has
been deconned and has
set up @ location MW13D
and begin split sporing
tomorrow

1600 Still reaming MW1D @ $\approx 30'$
- 35'

1630 PJP leaves - Reaming
complete for day

6/18/92 Am Pilep

(101)

6/19/92 Am Pilep

7:00 PJP arrives on site
Weather today - Sunny
Last $\approx 85^\circ$

At MW1D Reaming continued
to depth of $\approx 30'$

At MW13D - 1st split sporing
sample collected - well is located
near to tankers trailers and
three to four drums of which
one rusted.

0-2 Fill, gravel, silty
clay - NRAB

2-4 Brown silty sand some
gravel - NRAB

4-6 NRAB - Last specimen
on barrel ~~clay~~ ^{AP} silty clay
some sand - To ~~beaming~~ ^{analysis}

At MW13D - will now begin to
core.

At MW1D - The hole has
been reamed to $\approx 60'$

At MW13D Drillers have lost
auger cap down hole - attempting
to recover it

6/19/92

Am Pilep

(62)
1030

6/19/92 Pam Phelps

Drillers have still not recovered auger core - If unsuccessful in further recovery attempts - a new hole will be drilled.

Drillers backing off hole - will start new hole - will auger down to bedrock and begin coring. - Rock @ 46'

At MWID have reamed to depth - 269'

11:15

At MW13D Drillers will core to 51' and then will stop for week.

Will install drilling / coring casing and then will quit for week.

Have cored to 7'

Recovery is weathered bedrock similar to what was found

@ MWID - volcanic

11:50

At MWID - Compressor is down - No longer blowing air - Have drill

6/19/92

Pam Phelps

6/19/92 Pam Phelps

(63)

to depth - will set casing on Monday 6/22

Drillers pulling rods and will quit for day

At MW13D drillers also quitting for day

1200 PSP leaves site for day and week

6/19/92 Pam Phelps

(64)

730

6/22/92 Sam Phelps
PSP arrives on site - No drillers yet
GM arrive to set up - Drillers were to be on site by this time however now are not expected till later

Weather today
SUNNY ~ 85° Slight breeze

At MW13D coring will continue from 7'

At MW1D air compressor still needs to be fixed

900 Drillers arrive on site - begin setting up

Maintenance needs to be performed on both rigs before drilling begins

915 Begin coring @ MW13D

940 7.4 - 10' - weathered bedrock

Drillers out of water - Must wait for trucks to return to site

6/22/92 Sam Phelps

6/22/92 Sam Phelps

(65)

Before drilling can continue

11:15 Water truck filled +

11:20 Coring resumes from 160' NAAZ in B21 downhole

11:40 Coring interval 10-15' complete

10-15' Gravel weathered zone of unconsolidated material

11:50 Coring interval 15-20' completed

15-20' - ~~un~~ - ~~un~~ - ~~un~~ unconsolidated material pocket continues - evidence of clay - 2" of weathered material at end of clay

12:05 Drillers break for lunch

13:00 PSP arrives back on site (coring in progress)

20-25' Coring interval complete

20-25' highly weathered bedrock

1330 Begin coring 25-30' interval

1340 25-30' interval complete

25-30' 13' highly weathered bedrock

Obvious fracture zone 25-30'

(66)

6/22/92 Am Phelps

Recovery = 0

1415

30-35' coring interval
Complete30-35' Weathered bed rock with
slight fractures @ 32' / 33'

Recovery = 50"

RQIP = 12

1450

35-40' coring interval
complete

Bedrock as above

Fracture zones 38.5 - 39'

weathered - though not as
severely as above

Recovery 4'

RQIP =

1520

Complete 40-45 coring
interval40-45 - Bedrock - ~~95%~~ 72%
vicious

weathered fracture 43' + 44'

RQIP = 81

Recovery 4' 10"

1545

Complete 45-50' interval

Bedrock as above

Fracture zones 47.6 and 49

Am Phelps 6/22/92

Am Phelps 6/22/92

(67)

Recovery = 4.55

RQIP = 97

1605 50-55 interval complete

Bedrock as above

Recovery 3.8

Fracture zones 50.2 - 53.5 1.6

52.2 52.7 53.1 53.8

RQIP = 63

1630 Complete 55-60'

Bedrock

Weathered zone 57-59

Fracture 59-60'

Recovery 3.8

RQIP = 47

hole sounded to 60'

Drillers finish for day,

PSF leaves site for day.

Am Phelps 6/22/92

(68)

749

Pam Phelps 6/23/92

PSP arrives on site @ MW13D
Drillers setting up to continue
coringWeather today cloudy, humid
± 85060-65' coring interval
complete - bedrock w/ calcite veins

Recovery 4.3

Fracture 60.2

Weathered zone 60.3 RQD = 74

835

65-70' coring interval
complete

Bedrock w/ calcite veins

65.8-66.8 weathered zone

67' Fracture zone

68-70 weathered zone

Recovery 4'

RQD = 41

905

70-75' coring interval
complete

As above w/ calcite veins

Recovery 4.5' RQD = 61

Fracture zones ≈ 72

≈ 73.5

≈ 74

Pam Phelps 6/23/92

6/23/92

Pam Phelps

(69)

Water level taken this
morning in MW13D = 5'

No water in well as of yet

@ MW12 air compressor

is still down - Machine is
due in today to fix it

1015 75-80' coring interval complete

Fracture zone slightly weathered 79.5'

Recovery = 4.7'

RQD = 83 - Greenish gray, bedrock

1045

80-85' coring interval
complete

Recovery 4.8' RQD = 81

Weathered Moderate Fracture zone

@ 81.6

82.8 Fracture zone moderately

weathered - Greenish gray bedrock

85-90'

Recovery 4.8' RQD = 83

Fracture zones 85.7-87.1, 87.8'

Larger harder bedrock

90-95' coring interval complete

Same as above - Rock more competent

Fracture 93'

Recovery 4.6'

RQD = 90

6/23/92

Pam Phelps

(70)

13:05

6/23/92 Penn (Chap)
95-100' coring interval
 completed
 Recovery 4.9' RQD = 80
 Fracture zones @ 99.8
 96.7 Bluish

13:25

Bedrock - appears competent
100-105' coring interval complete
 Recovery 5.1' RQD = 73
 Fracture zone @ 102.8 Bluish

13:40

Bedrock appears competent
 Drillers rell water truck

14:30

105-110' coring interval completed
 Fracture zone @ 107.4
 Recovery = 4'
 RQD = ~~89~~ 82 77

15:15

110-115' coring interval
 completed - bedrock competent
 Fracture 112' / 114'
 Recovery 4.9

RQD = 89

15:35

115-120' coring interval
 completed
 Light fracture zones 115.7 / 118.7
 Recovery 4.9
 RQD 86

6/23/92 Penn (Chap)

6/23/92 Penn (Chap)

(71)

15:50 Drillers have reached
 depth - clean up finish for
 day
 16:00 PSP leaves site for day

6/23/92 Penn (Chap)

(73)

805

4/24/92 Pam Pilley

PSP arrives on site

Weather today, cloudy + hot $\approx 80^\circ$

@ MW1D air compressor is finally working - hole is being reamed out

Drillers down to 49' will continue to clear out hole before pulling out rods

@ MW13D - Drillers pulling out rods and cleaning hole - Will install temporary drillers casing (rods) to 40' to keep hole to facilitate lowering of geophysical logging equipment

Pulling out rods @ MW1D

950

@ MW13D - Pulled rods out - Will go down w/ tricon bits to clear out hole - Drill 55 rods to 58'

Water level in MW13D

@ 61.06'

after hole has been cleared

4/24/92 Pam Pilley

Pam Pilley

4/24/92

(73)

geophysical logging will occur

1000 @ MW1D - Rods have been pulled out - blockage at 13'

1100 Drillers going back into hole to clear blockage

1200 Hole has been cleared

Drillers lower casing - unable to push it past obstacle -

Casing comes back up dented

1310 After lunch - drillers have gone w/ 8" augers in an attempt to clear hole - Boulders in hole are preventing augers from going down

@ MW13D have reamed to 120' w/ tricon bit -

1400 Drillers removing rods from MW13D

1430 Drillers pull up rods - Sealed hole - Apparent blockage @ 66' Drillers send down tri-con pipe and confirm blockage @ 64' Drillers will Tri-con ream hole again

Pam Pilley

4/24/92

(74)

Sam Philip 6/24/92 PJO
 @ MWID - Augers ~~will be~~ are
 unable to remove blockage in
 hole.

GAM/Soil Tech has
 proposed the following plan
 to prevent hole from caving
 in - Will add grout to
 hole and let settle -

Tomorrow, hole will be
 reamed through grout. Casing
 will then be set in grout
 and more grout will be
 added to set casing.

@ MW13D - Will try on
 to 70' and see if blockage
 moves

1600 Drillers have reamed out
 MW13D - Grouting continues

@ MWID

1630 PSP leaves site

Sam Philip 6/24/92

(75)

6/25/92 Sam Philip

800 PSP arrives on site

@ MW13D - Drillers set to
 begin drilling - Looking
 for a way to contain
 grout dust

@ MW13D - obstruction has
 been cleared from hole - Water
 level has dropped to $\approx 93'$
 setting up to perform geophysical
 logging

Water level now @ 54.6' PSP
 14.79'

Begin geophysical logging
 of MW13D - Caliper sent down
 hole

1000 Encountered obstacle @ $\approx$
 60-70' w/ caliper - Drillers
 send down tremmie pipes to
 depth of 100'. No obstruction
 Drillers suspect a log may
 be interfering w/ lowering of
 caliper

@ MWID - Rig has broken
 down - Reaming has stopped
 at $\approx 20'$

Sam Philip 6/24/92

(76)

6/28/92 Pam Puley

1000

Rig has been fixed @ MWID

Reaming continues from 20'

1030

Cannot run geophysical
equipment down MWID -

Will ream hole 1st - then

log it - set casing then

ream out remaining 20'

and then log remaining
interval

Drillers removing casing
rods and will then decon
rig / and set up @ MWID

1045

@ MWID - Drill rig has
broken down again - hydraulic
connection has broken - Drillers
attempt to fix it

1220

@ MWID - hydraulic connection
has been fixed - reaming
continues @ $\approx 35'$

The conn^{ing}g^{ing} A's being
deconned

1520

@ MWID - Reaming to
70' is complete - Drillers
attempt to install casing,
- obstruction @ $\approx 17'$

Pam Puley

6/28/92

(77)

6/28/92 Pam Puley

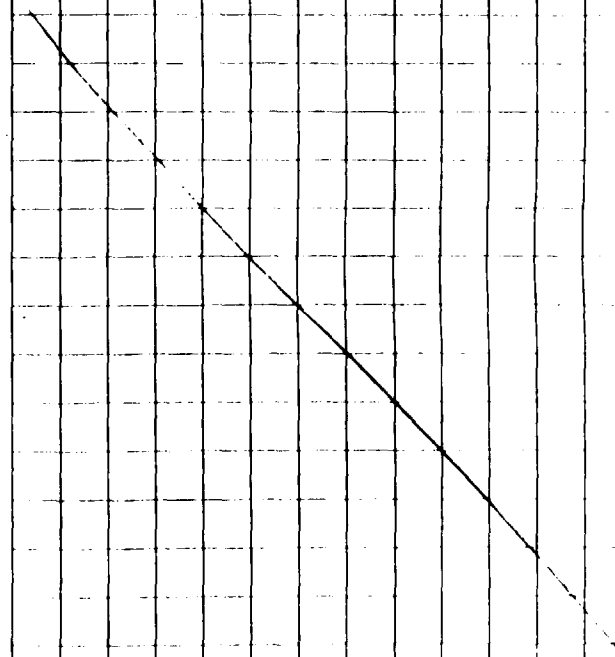
Drill rig (coning rig) is
being deconned - will set
up @ MWID and will

start sampling tomorrow

1545 Drillers attempt clear
obstruction w/ air hammer

1630 Unable to dislodge blockage

PSP leaves site for day



Pam Puley

6/28/92

(78)
800

6/26/92 Pam Philip
PSP arrives on site @
MW1 Drillers trying
again to ream out hole
to clear obstruction
@ 2' 4'

Weather today sunny
~ 80°

Drillers going to depth
in MWID 270'

@ MWID - split spooning
@ borehole has just begun

0-2' NRAB

fill with some silty clay

2-4' NRAB

900 Brown silty clay 11-91 sand
@ MWID - hole has been
reamed again GFM proceeding
to grout to surface again
and will ^{ream} it out on Monday
and then install casing

@ MWID

4-46 NRAB Brown

fine to medium silty sand
w/ clay w/ coarse gravel coarse sand

930

6-8 - Refusal @ 2' 4'

6/26/92 Pam Philip

6/26/92 Pam Philip

(79)

Auger down to 8' w/out refusal

6-8.7' NRAB

SAME AS ABOVE

8-10 NRAB

SAME AS ABOVE

Have augered to 10' - Attempting
to drive split spoon to 12'

10-11 - No recovery

Will Auger PSP auger to 11 and attempt
to drive another spoon.

1020 Encounter bedrock @

11.7' - GFM needs additional
sample volume - So rig will

be move .5' from original
location - Drillers will then
auger down to 29.7 and

will drive spoon from 9.7 - 11.7

1030 Augering to 9'

115 Sample collected PSP
leaves site for day & week

Pam Philip

6/26/92

(80)

0845

6/29/92 Andrew Namu

Andrew Namu at CDMARC on site @
MW-1D. Soil Tech + G+M scheduled
to arrive @ 0900. Weather: hot, sunny, humid.

0847

AS meets Ruffen Ponziano

0852

AS meets Clinton McFatt @ soil
Tech / G+M trailer.

Drillers will arrive in approx 1 hour.
AS receives H+S briefing.

Drilling supervisor - Max.

① CME-55 Coring rig. MW-11D.

② B-90 Air downhole hammer.

Texaco sta. - decan area.

8" dia. grout.

B-90 rams hole.

MW-11D @ 12' coring bedrock.

drilled through overburden.

Soil Tech - Mike Phason - mechanic

Clinton needs latest 8 hour

refresher (Pam's too)

MW-11D @ MW-1D on site

waiting for new drill bit.

Will go to MW-11D

0930

AS @ MW-11D

Drillers tripping out augers.

Using same HNW as 6/2/92

(4)

6/29/92 Andrew Namu

(81)

1000

HNW reads 6.2 ppm - possibly out
of calibration.

1012

Drillers preparing to core.

Going to core sheet then sample

Box 1, MW-11D, PRO 1301, 6/29/92

1025

Coring begins

expect to hit bedrock @ 10.

Drillers adding extension rod.

Depth to water - 10.6 ft

1030

~~Drillers~~ Pichi soil tech informs me

that he is finding out about
apartment for rent on VI. He will
let me know. (Pichi)

1035

AS meets Max (Soil Tech) - zoologist.

1045

AS meets Hector (Soil Tech)

Since PVC casing was not installed
prior to coring - used for recirculation
of water. (cutting fluid) water
was coming out borehole + onto
dirt. Because of this, PVC casing
will be installed and grouted
now. Also, drill rods were vibrating
because they were losing water.

Coring started 10.6 ft

Coring stopped @ 11.0 ft

(4)

(82)

6/29/72 Andrew Pano

Location of MW-11D adjacent to
Church - Level D - hard hat,
jeans, work boots, safety glasses.

1145

Slightly windy.
Drillers quit temp. 4" PVC casing in place.
Ruben classifies bedrock
10.6-12.0 ft. - Run*

12 ft recovery.
① ROD-39

Fractures 10.6, 10.8, 11.4
approximate.

Slightly to moderately altered
bedrock.

penetration rate - 1.4 ft/4.5 min - 0.3 ft/min
outside - bluish gray

penetration 1.4 ft

Moderately strong.

inside - bluish-green f m felt par
crystals.

1245

1225

1245

Drillers break for lunch -

AS calls Sally Coland - leaves message

AS onsite @ MW-11D

Drillers going to decon split spoons.
+ preparing equipment @ both areas.
MW-11D, MW-10

②

6/29/72 Andrew Pano

(83)

Drill bit not in yet for MW-10.
Early start tomorrow.

1320

1330

Area is roped off w/ Caution Tapes
AS @ decon pad @ Texaco Sta.
Corner of 35th + 32nd

AS oversees drilling crew deconing
split spoons.

Proced. are:

- 1) wash w/ tap water + detergent
- 2) tap water rinse
- 3) 10% Nitric Acid
- 4) tap water rinse
- 5) Methanol
- 6) Hexane
- 7) DI water
- 8) Air dry.

1430

1445

AS leaves decon area

AS calls Sally Coland.

Code arriving Thursday

ASK where they get sec

Chemicals?

DPNR - (804) 774-3320

Mr. Leonard Reed.

Sec'y - McCallie

Thursday

②

(84)

6/30/92 Andrew Pano

Nisky Center

Suite 231

Number 45A

Estate Nisky

Charlotte Amalre

2' story center

Peayle Vision center

2nd floor.

* Small coolers + Vermiculite
shop for.

Telephone @ fire dept.

End of day.

1500

(A)

(85)

6/30/92 Andrew Pano

0645

AS onsite @ MW-11D

Soil Tech + Gm onsite

Max (Soil Tech) + Ruben (Gm)
Drillers.

Weather: - 80° sunny, humid. going
to be hot today, slight breeze.

Using Gm HNU - Need to calibrate
COMPC HNU.

Drillers preparing to core.

4" pvc pipe w/ return line for water
recirculation.

0657

~~Core begins.~~ Drillers clean hole to
12 ft.

0700

Clinton Moffatt onsite - Chemicals?

PCI Scientific Supply Co.

Garfield, NJ. (201) 478 6065

"One Stop Shopping" "Larry"

Gm HNU Clinton sent you

LINC Quantum Analytics

363-D Vintage Park Drive

Foster City, CA 94404

800-992-4199

(R) S/N 506639 S/N 101363

Probe S/N 101363 10.2 cm

(A)

AS

(86)

6/30/92 Andrew Pump

0700

Clinton tells me Woodworth in town. Sells small coolers. No catfish for 6/30. per Clinton. Drill bit was received in Puerto Rico yesterday but is missing on plane @ VI this morning. B-90 will be decomed + moved to MW-1 shallow well. @ approx 0930 will be ready approx 2 ft overburden. GIM will take sample @ MW-1

0705

Coring begins @ 12-15 ft MW-110 Box 1A 6/30/92 Run 1A

0720

Soil Tech worker shoveling mud/soil from bottom of water pit onto ground in a pile. AS informs Soil Tech/GIM to put into drum now instead of later.

0724

Coring stopped - 16 min / 3 ft. RQD = 0 - all less than 4 ft. Penetration rate = 0.18 ft/min Recovery - approx. 3 ft. Fracture Zone - 13, 13.2, 14, 14.5 approx. Description - same as above. Down pressure - 300 psi

(K)

(87)

6/30/92 Andrew Pump

0741

Coring begins Run #2 (15-20') down pressure 50-100 psi

0800

Drillers arrive w/ 55 gal drum to contain cuttings.

0805

Coring stopped. Run #2 (15-20') Recovery - approx 2 ft.

RQD = 0

% Recovery - 40%

penetration rate - 5 ft / 37 min = 0.13 ft/min.

fracture zone - approx 20.7 ft to 21.8 ft

highly - severe weathered - breaks easily.

very weak.

The ends of the sample recovery are same as above w/ the middle as described.

0840

Coring begins Run #3 (20-25')

0845

Ruben monitors breathing zone @ drill rig. ~~6/30/92~~ bld - open. No readings.

0903

Coring ends - Run #3 (20-25') @

Recovery - approx 2 ft (100%) (80%)

penetration rate - 4 ft / 23 min = 0.17 ft/min

RQD = 0 Fract. zone throughout

Down hole - 50-100 psi

moderate to weak highly weathered

(K)

(88)

6/30/92 Auburn Camp

0916

Run #4 Coring begins (25-30')

0920

AS leaves MW-11D

AS @ decon pad - Driller's start cleaning rig.

0932

GMI preparing field blank

AS returns to MW-11D - Decon /
set-up will be another 1 1/2 hrs.

0956

Coring ends Run #4 (25-30')

Downhole - 50-100 psi

RAD - D

Recovery - approx 3 ft (60%)

Penetration - 5 ft / 40 min = 0.13 ft/min

Fractures throughout

slightly to moderately altered.

Moderately strong.
fracture.

1005

Run #5 Coring begins - (30-35')

Downhole ~100 psi

1015

AS leaves MW-11D

AS @ MW-1

1040

Drilling begins -

1050

Sample 0-2' No HNU readings

recovery - 18"

bc - 4", 70, 75, 50/4"

all, dk grey silty clay some sand + gravel.

(89)

6/30/92 Auburn Camp

(89)

1055 Geraldine Miller collect sample.
0-2' MW-1 (0-2')

1100

AS leaves MW-1 returns to MW-11D.

Gordon onsite - AS leaves site - Gordon
shows AS apartment for rent -
\$600 + cable. plus maid x 2 a week

office 776-1111

house 776-7777

upstairs 777-7117

Gordon Caffelt -

Tefic view, small.

1145

AS @ MW-11D

Driller's went for lunch

1155

AS @ MW-1

Boring @ approx 16 ft
reaming w/ 7 3/4" bit

1200

Driller's stop for lunch

1240

AS returns to MW-1

1255

Driller's @ 20' - will go to 45'

1300

AS calls office - speaks to Pam Phillips @

informs her of apartment. Sally Odland @
meeting @ EPA.

1320

@ MW-1 Wanda informs me that screen

interval slt approx 25-45' @ MW-1D

Open hole interval approx 65-85'.

(89)

(90)

6/30/92 Andrew Hano

1330

AS @ MW-110

Ruben informs me that they are currently
Coring to 42' @ Run #8.

No CIA PPL oversight Run 5-8.

1339

Coring ends Run #8

Recovery - approx 1.5 ft.

ROD - Ø

Penetration rate - 2 ft / 33 min

Downhole - 50-100'

~~fractured throughout~~ (A)

inside core, outside bluish

fractured approx 40.3, 41.0 ft.

moderately strong, moderately altered

1346

Coring 42-45' Run #8A

1400

Coring stopped 42-45'

Recovery - 3.2 ft

ROD - Ø

penetration rate - $3.2/14 = 0.23 \text{ ft/min}$

Downhole pressure - 50-100 psi

weathered fracture zone

same as above

1413

Coring begins 45-50' Run #9

1436

Coring ended 48-50'

Recovery - 5'

ROD -

(A)

6/30/92 Andrew Hano

(91)

WBL Penetration Rate - (A) 5/23

Fractures @ approx 45, 45.5, 46-47.2, 48, 49

46-47.2 - weathered fracture zone

bluish green. feldspar water rich

moderately strong, slightly to moderately

altered. quartz. calcite streaks.

1500

AS leaves MW-110 arrives @ MW-1

Drillers end day @ MW-110 - crews ahead

of schedule + B go must catch up.

Drillers moved to 46 ft @ MW-1.

1520

Drillers assemble 4" stainless steel

1000 slot screen, 20 ft screen, 35 ft riser

pipe. 55 pipe was steam cleaned.

boring collapsed to 43.3 ft. (bot of

screen)

Depth to water 33.6 + coming up

1600

Clinton onsite confirms screen interval

@ 23.3 - 43.3 ft.

AS notes sand pack not installed w/

tie-in pipe as indicated by W.P.

top sand pack 21.1 ft

1610

(4 bags @ 100 lbs ea.)

bentonite pellets added to 19.1 ft

12 contained.

(A)

(92)

6/30/72 Andrew Hump

1615

Will govt tomorrow.

1620

AS leaves site.

1630

AS calls Sally Odland

why was sand set course?

DPNR - call Thursday may arrive on Monday.

Govt per diem \$93

1645

End of day.

(A)

(A)

7/1/72 Andrew Hump

(93)

0745

AS onsite @ MW-1

Weather - 80°, sunny, slight breeze

Soil Tech onsite - Drillers + Wanda

Drillers will decon R-90 rig while

other drillers decon @ govt MW-1.

Drillers will then move to MW-14, located in same parking lot.

0805

Wanda measures static water level

(Depth to water from top of well casing) - 30.24 ft.

Note: Water level Indicator is electric type

Micro + tap water used to decon

Electronix tip is deconed, not tape.

0830

AS @ MW-11D.

Drillers @ 52.4' closed.

Depth to water - 18.6 ft from ground surface

Run # 10 (50-52.4')

Recovery - approx 2 ft (83%)

Static @ R-90 - 21

penetration rate - 2.4/27 = 0.09 ft/min

pressure - 100 psi

bluish gray, slightly altered,

moderately strong, feldspar, dull,

fine grain, quartz, gray, weathered fragments

zone of silty approx 1 ft at approx 52

(A)

(94)

7/1/92 Andrew Hump

0910

AS @ MW-1

Drillers preparing grout.

0915

Drillers add grout w/ frame pipe.

Need more cement. grout approx 3 ft below ground level.

0940

AS @ MW-110

Drillers reach SS-60' casing.

0955

AS returns to MW-1

1015

Drillers return to MW-1 w/ cement.

1020

Drillers mix grout and add.

1025

Need more water for grout.

1100

AS @ MW-110

Cored (65-70') Run #13

recovery. 4.9 ft. approx.

RSD - 716

Fractures approx @ 65.4', 66.6', 68.0', 69.1'.

penetration rate = $\frac{5}{15} = 0.33 \text{ ft/min}$

slightly weathered fractures observed.

pressure 100-200 psi.

1102

Casing begins (70-75') Run #14

1112

Casing ends Run #14 (70-75')

penetration rate = $\frac{5 \text{ ft}}{10 \text{ min}} = 0.5 \text{ ft/min}$

RSD.

recovery - 5 ft

(12)

7/1/92 Andrew Hump

(95)

1115

pressure - 200 psi.

fractures, weathered observed @ approx 71.7', 73.4', 74.0', 74.6'.

bluish gray, slightly altered, moderately strong. fine grains, calcite veins

1145

Drillers break for lunch

After lunch, rods will be pulled + rig cleaned + prepared for decon.

1150

AS takes lunch

1230

Sample 0-2' @ MW-14 No. 14 (14-15)

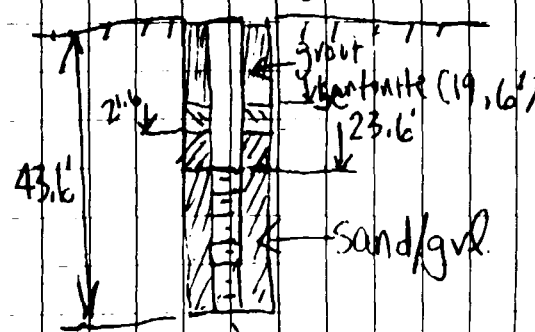
fill, asphalt. Some silty clay + sand/grl.

Drillers take lunch.

GTM takes sample 0-2' MW-14 (0-2')

Note: MW-1 completed manhole cover set w/ concrete. grout completed.

MW-1 diagram.



(14)

(96)

7/1/72 Andrew Hano @

1300

@ MW-14 Sample 2A 3'

recovery to

fill, asphalt, sand + gravel. Wanda takes sample for GC.

No elevated H₂S

Note - Cohen informs me that drills will work on cleaning MW-14D area + removing rocks from borehole. Decon will be done tomorrow morning.

1305

Overburden was @ approx 3 ft. thick

Drillers setting up for reaming

1330

One of the drillers (Rohan) sprains his ankle. Ar + Clinton assist him back to Soil Tech trailer + Hechter takes him to the hospital.

1355

AS @ MW-14D.

1417

Reaming begins

1445

Sally + Wanda (called office)

Sulfur Bay Apartments
Agency in Kansas

Jennifer

1 Bdrm + efficiency

Security

Call DPR in morning

Bdo Amer to - Fed Ex Mail to PTP
alert them.

(97)

7/1/72 Andrew Hano

(97)

1545

Reamed to 31' then air

1555

Drillers stopping @ 31' - going to get well materials today, then finish hole tomorrow morning + set well.

1730

AS checks out Sulfur Bay Apts.

- 1 Bedroom - secure! , nice view, huge, pool, tennis, weights, bench
- Efficiency - bland, no pool or tennis - just beach, twin beds

1800

Go w/ 1 Bedroom. Mail weekly incl
End of day write laundry.

(98)

(99)

⑧

7/2/72 Indian Head

0710

AS onsite @ NW-14

Soil Tech onsite Wanda + drillers

Weather - Hot, 85°, humid, sunny.

Drillers began teaming NW-14 down to approx 35'

0750

Reamed to 48 ft. Fare cleaning borehole.

0805

Drillers are tripping out rods.

0818

Drillers install 2" 4" stainless steel screen. (25.2-45.2) @

0830

Wanda measures depth to water from ground surface = 42.82 ft. + coming up low Wanda measures total well casing. 45 ft. 2.5 in @ 45.2 ft. @

0840

Sand is added to 22.8 ft (2 1/2 ft above screen top) 5 3/4 bags sand.

0850

Bentonite pellets to 19.8 ft (2 ft) + hydrated. (1/2 bucket) @

0910

Grout is mixed / added.

0925

Drillers set manhole cover + cement

0930

AS calls office - speaks to Ray Defaria + Jeanne Litwin.

1015

AS @ Soil Tech Trailer.

DPNR info. p. 83, 84.

Secy. McColie

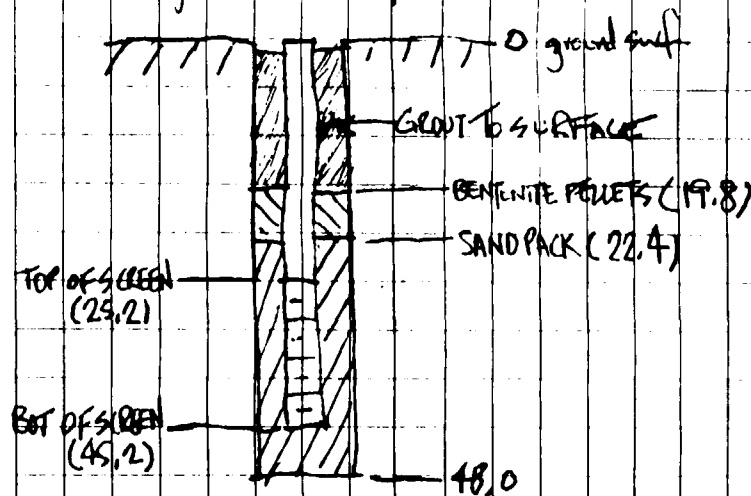
Mr. Leonard Reed - Coolers Mon?

⑧

⑧

7/2/72 Indian Head

Diagram - (NW-14)



NOTE: ALL DIMS SPECIFIED IN FEET.
4" STAINLESS STEEL W/ 20 FT SCREEN

1100

AS Cures times out to office. Called DPNR - Phone networking.

1200

AS @ DPNR - spoke to McCawley (secy) coolers not in yet.

1330

Winward Passage Hotel - Fed Ex. Dropped time sheet @ Fed Ex. for Jeanne Litwin. 400-5799-0593. Fed Ex @ Winward Passage

1340

End of day

⑧

⑧

(100)

0830

0900

0910

0915

1030

7/6/92 Andrew Hano

AS packages HNU for FedEx

AS onsite @ Decon Pad (Teraco)

Drill overburden @ MW-12D - grout PVC

Coke 12-D tomorrow weather - 85°F, Sunny, wind

Decon B-90 today set up - Ream

MW-10 tomorrow

Clinton, Ruben, Soil Tech on site.

Drillers prepare CME-SS rig for

MW-12D. AS drives HNU to Fed

Express to ship to HAZCO.

Fed-Ex Airbill # 400-5998-8810

AS onsite @ MW-12D

From Rubens notes:

Sample 0-2 ft.

Recovery - 12"

bc - 15, 33, 25

Silt, some clay, tr. sand, very fine

HNU = 0 ppm

Sample 2-4 ft

Recovery - 0.7"

bc - 17, 7, 13, 21

brn clay, some silt, some gss towards
top of spoon, dry.

7/6/92 Andrew Hano

(101)

1050

Using HNU EPA # 464273

Calibrated 7/1/92 by R. A. H. H. H.

span 5.0, scale x 200 set @ 65 ppm

w/100 ppm 15 dly.

6 kgd - 0.7 ppm

probe EPA # 464274, 11.7 eV

1100

Sample 4-6"

Recovery - 20"

bc -

light brn, tan hard clay, some silt

some f sand, tr. gvn

GTM takes soil sample from

this spoon

HNU - 0 ppm

Note = hit bedrock @ 5'-11"

Overburden is 5'-11" thick

1110

Drillers prepare to set PVC pipe

for water recirculation.

1115

Drillers leave for cement.

1145

Drillers return w/ cement. - take hand.

1220

AS @ MW-12D

Drillers begin mixing grout.

1230

Drillers grout recirculated in pipe in place.
& cover top.

(102)

1245

7/6/92 Andrew Hump
Drillers will decon auger + split spoons
@ decon area.

1250

AS @ decon pad.

1300

AS observes drillers decon split spoons.
B-90 drilling - mechanical arm is not
working. Drillers trying to fix problem.

1400

Drillers finished deconing.

Doing maintenance on rigs.

AS leaves site - calls Jeanne Lohm
informs her of activities.

7/7/92 Andrew Hump

(103)

0730

AS onsite @ MW-1D

Gm + Sol Tech onsite.

Weather - 85°F, partly cloudy

Clinton informs me that drill bit will
arrive @ 0800-0830. Drillers are filling
water tank for MW-12D coring.
Using same HNU as 7/6/92.

0800

Drill bit arrives @ MW-1D location.

0805

Problems w/ mechanical winch arm.

0840

Drillers having problems getting 8"
drill bit off.

0845

AS @ MW-12D - Drillers not there yet.

0848

AS @ MW-1D - Drill bit not off yet.

0915

AS @ MW-12D - drill bit not off @ MW-1D
yet. Drillers preparing to drill (core)
@ MW-12D.

0945

Drillers will core from 5' to 10'

0946

Coring begins. (No HNU reading 9.8)

①

0950

AS @ MW-1D - Drill bit not off yet.

0955

AS @ MW-1D

0954

Coring stopped @ 9 ft. (Adding extension
length to 10')

1000

Coring begins.

1002

Coring ends @ 10 ft.

(104)

7/7/92 Andrew Hump

Core 5.9' - 10' (Run #1)

penetration rate. 4.1 ft/10 min = 0.41 ft/min.

recovery - $\emptyset$

downhole pressure - 200 psi

1011

Coring begins (Run #2) 10-15'

1020

Drill bit is off. - Installing 10" bit.

1038

Installation complete.

1045

Texas Grit - m-c sand pack.
is used for well installations in
screened interval.

1050

"Environmentally safe" lubricant is used
for extension rod @ joints -
Soil Tech informs me that MSDS sheet
available @ field trailer.

1055

Reaming begins.
Will ream to 89'.

1110

AS @ MW-12D

Run #3 (15-18.5')

recovery - approx 2.2'

ROD - $\emptyset$

penetration rate 3.5' / 18 = 0.19 ft/min

pressure 100 psi

Moderately strong @ weathered fracture
zone, moderate to highly altered, to
saprolite
very weak, non staining.
G breaks w/ finger pressure.

(105)

7/7/92 Andrew Hump

brn to tan clayey silt.

1150 Driller's taken lunch.

1250 AS @ MW-10 - reamed to approx 38 ft
thus far.

1300 AS @ MW-12D

1313 Coring stopped. (Run #4) 20-25'

recovery - approx 2.8 ft

penetration rate - 5' / 13 min = 0.38 ft/min
ROD - $\emptyset$

pressure - 150 psi

(A)

Moderately weathered, fracture zone, clayey
throughout - highly altered to saprolite
very weak, non staining, brn/gray, wet

1320 Coring begins (Run #5) 25-30'

1343 Coring stopped (Run #5) 25-30'

recovery approx 4 ft.

penetration rate - 5' / 23 min = 0.22 ft/min

ROD - $\emptyset$

pressure - 50-100 psi

same as above

1406 Coring begins (Run #6) 30-35'

1446 Coring stopped (Run #6) 35-38.1 ft.

recovery - approx 2.4 ft @

penetration rate - 3.1 / 42 = 0.07 ft/min

ROD - $\emptyset$

(A)

(106)

7/7/92 Andrew Hump

1448

pressure - 100 psi
moderately altered (somewhat weathered),
moderately strong to weak, bluish
green fractured zone throughout;
vertical fractures, bright to dirty.
red @ rectangular to regular grain.

1505

AS @ MW-1D

Drillers @ 61 ft.

1510

AS calls office - speaks to Ray DePina.
move to Saffire Bay on July 15.

Jeanne Litwin line busy -

Note - @ MW-12D will corer 40'
today + check water level in
morning

1625

AS calls Leonard Reed - confirms
that 5 coolers received Monday
@ DNR - more space is available
if we need it.

1700

Grouting machine not working.
Will install casing tomorrow.
Reamed 10" hole x 70' deep.
Will tie out rods tonight, in case of
cave-in.

1715

AS leaves site

(R)

7/8/92 Andrew Hump

(107)

0745

AS onsite @ MW-1D
Grouting machine was started last night
and casing was set to 70 ft. (6" stainless
steel) No PPC oversight. Clinton tells
me that Hermie pipe was used for
grout.

@ MW-12D cored to 40 ft.

0755

Weather: Hot, sticky, humid, 90, cloudy
Using same HNU as 7/6/92
Will use 5 3/4" bit to 90'

0805

Wanda measures depth to water - 32.16 ft
to top of well casing holder - (-10.5 m)
 $32.16 - 0.9 = 31.27$ ft from @ ground
surface. Ream 70-90 ft w/ 5 3/4" bit.
Dixon + go to MW-13D.

0810

Clinton tells me that next week will
be critical week - Starting Four
Winds + Four Winds will have their
own oversight watching CDM PPC.
Also lab sample(s) will be taken.
@ MW-1D - grout to 1 ft

0930

Reaming starts

0935

AS @ MW-12D

Static water level = 25.96 ft from
ground surface - cored to 38.5' thus far.

(R)

(108)

0951

Drill down Pump 718 ft
 Coring begins @ 38.5 to 40 ft. (Run #7B)
 Recovery - approx 1.5 ft.
 pressure 100 psi

1001

Penetration rate - 1.5/10 - 0.15 ft/min

Coring ends Run #7B
 moderately altered, moderately strong
 to weak, bluish green, fractured
 zone, bright to silty.

1010

Water pump on CME-SS malfunction.
 Drillers checking out problem.

1020

AS calls Jeanne Litwin - Informs her
 of daily activities + next week objectives.

1025

AS @ MW-1D - reaming @ approx 75 ft
 thus far.

1050

Note. Will need new log book soon.
 Drillers @ 80 ft.

1055

AS @ MW-12D

Changed water trap

1123

Coring begins (Run #8) 40-45'

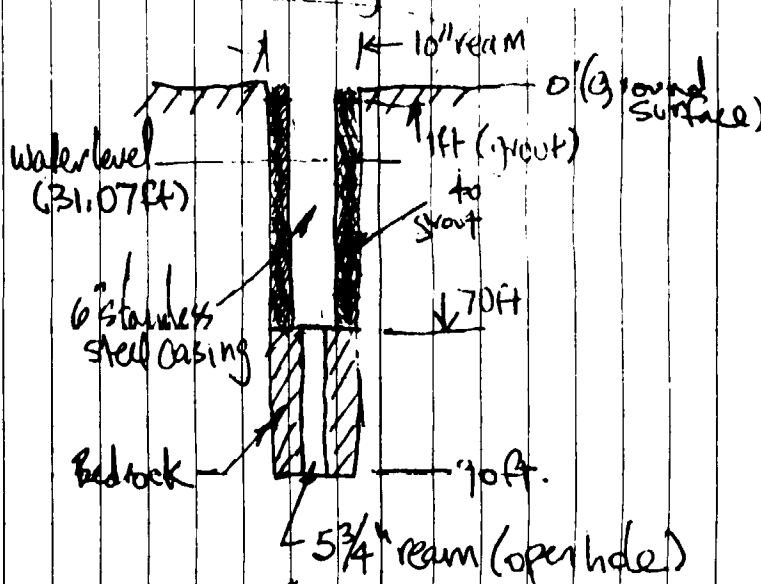
1130

AS @ MW-1D - hammering -
 reached 90 ft. $\therefore$ open hole interval
 is 70-90 ft.

(A)
 (B)

(109)

Drill down Pump 718 ft
 MW-1D Diagram



1200 AS takes lunch

1200 AS @ MW-1D

Drillers cleaning up + decom rig in
 afternoon.

1315 Depth to bottom = 89.38 ft to top of
 well casing.

1325 AS @ MW-12D

36 Run #8 (40-45') same as 35-40'

1341 Coring begins (Run #9) 45-50 ft.

1345 HNU reads 6.0 in breathing zone @
 well. 6.0 + 0.7 ppm -

(A)

(W)

1410

Andrew Pump 718/42 @
 Coring ends (45-50') @ 49.5'
 penetration rate $\frac{4.5}{37} = 0.137$ ft/min
 recovery - approx 3 ft.

RQD - 11.

pressure - 100 psi

same as above.

Run #10 (49.5 54)

1445

AS copies logbook notes from past
 1 1/2 weeks.

1500

AS @ decon pad - drillers clean
 cleaning rig + augers/extensions.

1515

AS @ MW-120.

Coring stopped @ 50.2' - Need new
 diamond bit to continue
 Deconing B-90 now - set up tomorrow
 morning.

1530

AS @ decon pad - will decon all
 equipment today so they can begin
 drilling in morning.

1600

AS leaves site

(AS)

(AS)

7/19/92 Andrew Pump

(M)

0735

AS on site @ MW-10

Weather: 85°F, Sunny, partly cloudy
 Using same HNU as 7/6/92 - began 0730

0740

Clinton measures static water level
 (to top of well casing) = approx 87 ft

0800

DTH @ AS @ MW-120

Bore collapsed @ 4 ft - depth to
 water could not be measured. Driller's

0830

flushing/cleaning hole to 50.2 ft.

AS calls Jeanne L'Hevin - informs
 her of objectives for day.

0900

AS observes Soil Tech filling water
 tank @ Standpipe

0920

Drillers return w/ water needed for
 drilling.

0935

Ruber informs me that other crew
 is beginning to move B-90 to
 MW-130 + set up to ream.

0959

1024

Coring begins (Run #100 50.2-55' @
 Coring stopped (Run #100A) 50.2-52.8-53.0
 recovery - approx 2 ft.

penetration rate - $\frac{2.8}{25} = 0.11$ ft/min

RQD - 0

pressure - 150 psi
 same as above.

(AS)

(112)

1100

Andrew Hump 7/9/92

AS @ MW-13D - will team to 100ft.
+ geophysical log - most likely set
casing tomorrow morning.

1245

AS @ DNR -

Inventory - 5 medium cokers

- 1/2 dozen typet
- 1 box singles
- pt paper
- (1) logbook
- 2 roll strapping tape
- 1 dozen pipets, disposable
- 1 roll duct tape
- 1/2 dozen Nitrile gloves
- 1 case dental wools
- 1 case 800 den. gar.
- 1 case 16 amber bottles
- 1 case 16 poly.

1330

AS @ MW-12D

@ pl. 20 ft. problems w/ clogging since
fracture zone contains cracked bedrock.
Characteristics have not changed -
Same as above

(AS)

(113)

Andrew Hump 7/9/92

1340

AS @ MW-13D

Reaming borehole - approx 31-32 ft
thurs far.

1430

AS with Susan Colligan @ COM FFC
Boston office.

1515

AS @ MW-13D - Down to approx ⁶⁵ 26 ft.

1520

AS @ MW-12D - Cooled to 64 ft. thurs far.

1524

Drill rod extension checked off -
depth 64.6 ft.

(64.68 - 64.6) Run #14B
recovery - approx 1.2 ft, pressure - 100 psi
penetration rate - 0.15 ft/min

RQD - 25

Same as above.

Note: Bring to 85 ft.

1555

Logging beams (Run #14C) 64.6' - 65.0'

1557

" " end @ 65.0'

penetration rate - 0.13 ft/min

recovery - 0.15 ft approx

RQD - 0

pressure - 100 psi

Same as above.

1600

Drillers quit for day, @ MW-12D

1610

AS @ MW-13D

(AS)

①

1625

1700

1710

1715

Andrew Hano 6/9/92
 Drilled to 96.5 ft then
 Reamed to 102.5' cleaning borehole.
 Drillers complete running - tripping
 rods out of borehole
 AS LEANS site.

AS

AS

Andrew Hano 6/1/92

②

0745

AS on site @ MW-13D

Weather - 90°, sunny, breezy.

Geophysical log will be conducted @
 MW-13D borehole by Clint & Wanda.

Depth to water 65.68 ft. from ground
 surface.

0900

Preparing geophysical equipment -
 problems calibrating.

0955

Calibration complete.

1000

Testing started. 8
 log stopped @ 86.96 ft. (hole caved
 in overnight to this point.
 Arms measure to 86.96 ft.

Casing will not be set today.

(Mon) casing will be set.

1030

AS @ MW-1D - Manhole cover
 set in place this morning w/ cement.

1050

AS @ MW-12D
 65.4-70 ft. - No recovery - possible
 unconsolidated zone.

Will reach depth @ Monday.

1100

AS @ Salt Tech. Hauling office.

1130

AS copies logbook notes to 6/10.
 AS LEANS site.

AS

(W) 7/13/92 - Susan Collage

0900 - Arrive G+M/Soil Tech. office
Meet Wanda Morales of G&M

0930 - Clinton Moffett arrives office G&M
Weather: Hot humid ~ 90°F. Sunny.

Currently @ MW-13D w/ CME-55.

Reaming MW-13D to 100ft. (B 90)
will set 6" casing.

Next location CME-55 (Rock core)
will be MW-7 [B-90 (Reaming)]
MW-7 - "probably" next.

0930 After safety meeting arriving at
MW-13D where they will reream to
100' 65.6' Depth to water. Friday
the drillers couldn't get all the
way down to 100' according
Clinton M.

1110 Finish reaming out hole (MW-13D)
Crew pulling up pipe.

1200 Hole is blocked by large rock
that fell into the hole. Drillers
break for lunch.

1235 Try to call Sally Odland from
Soil Tech office. Sally is
still on vacation. Until
tomorrow.

Susan Collage

(W) 7/13/92 Susan Collage

Spoke to Andrew Odland, just to
check in - and nothing to report.
Will call Sally tomorrow to check
on sampling.

1245 Drillers - trying to send
pipe down the hole again.

1355 Hammer caught up on rock

1450 Hammer still stuck they're
having problems - no air
or water is coming back up
the hole.

Earlier in the day location
MW-13D was shut down due
to complications (drill rod
stuck in the hole - irregular)
- Soil Tech employee flew back
to Puerto Rico to pick up
special tool to fix problem
- They probably won't be working
that hole again until
tomorrow.

1510 Grout mixture has been here
since noon. Water truck is
probably will not get to grouting
today.

Susan Collage

(R)

7-13-92 - Susan Collage

* Additional crew on CME-55 B-90

- Jose Ramos - Rig Leader
- Oscar Garcia - Foreman B-90
- Manuel Morales
- Jose J. Nieves

Crew on CME-55

- Juan Rivera - Foreman CME-55
- Jorge Diaz
- Jan Mullet

1600 Rig crew begins to place 6" casing down the hole

1640 100' of casing down in the hole successfully

1700 Begin mottling grout - rig crew assembles thermally tube

Clinton makes some interesting points about 4 Winds Shopping Plaza

They may have to begin borings before 4 Winds wells due to access problems

Will check how this will effect sampling

1805 Grout up to 20 feet. There's sediment in the well bottom - but this will be cleaned out later, (Tomorrow)

1830 Finish grout 380 gal total

1840

Leave Site

Susan Collage

(119)

7-14-92 - Susan Collage

0720 - Arrive MW-13D

Weather - Sunny, humid, ~90°F
Clinton Moffett conducts tailgate safety meeting - everyone signs sheet

0730 - B-90 rig crew changing drill heads for second stage of reaming (100-120')
They will probably finish setting this well today

0740 - Clinton informs me that in the other hole the CME-55 has broken drill rods in the hole. Rig crew will be working to correct the problem today. Clinton speculated that they may have possibly hit a very fractured rock zone which may have cause rock to buckle onto the rods

0745 Wanda and/or Clinton will conduct geophysical logging on 100-120' portion of the hole, second stage for this hole. First stage was done on Friday (0'-100')

Susan Collage

(V20)

0900

7-14-92 - Susan Collagan
Hydraulic hose breaks on B-90.
Someone from Soil Tech goes to find
a part to fix it in town.

0950

Wanda Morales gets word that
part cannot be found on
St. Thomas and that someone
will need to fly out to PR.

1005

Go to Soil Tech office, call
Jennifer Jarvis @ Ocean
Property Management to arrange
key pickup for the apt.

1020

Go back to hotel to make
a few more calls.

1050

Speak to Sally Odland in NY
to update her on the project.
Mentioned that access problems
at 4-Winds may cause the
shallow borings program to
begin sooner. Will check
with Clinton to see when he
thinks the shallow borings
will begin, and call Sally
later today.

1130

Go to Ocean Property Management
and meet with Jennifer Jarvis.

Susan Collagan

(V20)

7-14-92

Susan Collagan

To collect key to new apt. and
inspect. Cannot get card key for gate
until tomorrow.

1230

Return to site. (MW 103)
No activity. Soil Tech will
go back to TK to get parts.
Check out MW-12. They
are working to correct
problem there.

1300

Go back to Soil Tech.
office. Clinton Moffett
has gone to DPRN in
town.

1505

Speak to Clinton at Soil
Tech. Says there is a
possibility that they
may get access to 4-winds
soon. I don't think
we'll get to shallow
borings this week. Hence,
resampling for PVC.

1600

Call Sally Odland inform her
of Clinton's schedule and of
the problems w/ the hotel
rate.

Susan Collagan

(122)

7/14/92 - Susan Colligan

Sally would like me to find out from G&M, assuming that if they get access to the Winds Shopping Center they will jump at that opportunity to install the well there, will they be getting to shallow borings next week and if so, which ones, to see if we might be able to get a split sample at a preferred location per FTA's request? those being:

Curriculum Bldg: B-1; B-6;

MW-1; MW-14

Tech Property: B-8; MW-5;

MW-7.

Additionally, Sally would like to know if the 4-Winds Shopping Center groups consult and will want to take confirmatory samples as well. This may create a problem with required volume for all sample parameters.

Susan Colligan —

(123)

7/15/92 - Susan Colligan

0700 Arrive @ MW-13D

Drill crew is in the process of placing the equipment in the hole for reaming out last 20'. Wanda Morales informs me that the piece for the hydraulic hose is enroute from PR and won't be here for another day or two, but that they had a piece made on the island that appears to be working in the mean time.

0800 Began reaming

0835 Down ~ 110'

0905 Down 120'

Wanda prepares to do geophysical logging from 100' - 120'.

Depth to water -

1100 At G&M / Soil Tech office
Contact Sally Ordano and inform her of activity plan if G&M cannot access 4-Winds. Wanda finished Geophysical logging.
B-90 will move over to MW-13D

Susan Colligan —

(124)

7/15/92 - Susan Collagen
to assist in getting drill rods
out of the hole

1130 Back to hotel to check out
and pay for room. All
straightened out - low rate
was given to FPL.

1220 MW-12D no luck trying
to remove rods w/ B-90.
Soil Tech will leave tools
in the hole, grout and abandon.
Will speak to Clinton about
the particulars of this.

1250 Adcom. aka Texaco, drillers
decom B 90 in preparation to
ream out 12D.

MN-13D finished - OPEN HOLE
WELL into competent rock.

1400 S.C. back at G&M / Soil Tech
office. Clinton Moffett
informs me that they have
gained access to 4 Winds
Plaza and will begin
MW-6D on Tuesday. Tuesday
date was selected because
Ana Gloria Ramo's - designated
Susan Collagen -

(125)

7/15/92 - Susan Collagen
Coordinator for 4 Winds, will
be here.

1500 MW-12D - bore hole grouted
and abandon. Clinton mentioned
that the B 90 will ream
down to 65 feet and then
the CME 55 will ream

Coring at an area next
to original hole at MW-12

- Call Sally Odland. Inform
her that they have gained
access to 4 Winds. Since
she has already confirmed
w/ CLP people no samples
this week and two samples
next week, we will try
to get 2 from 4 Winds.
One @ MW-6D and one
@ MW-9 (potential assuming
they get to it) This will
eliminate MW-7 because
this location will probably
be completed tomorrow.

- Sally has arranged to
send CLP paper work

Susan Collagen -

(126)

7/15/92 - Susan Collage
and chemicals to the apartment
I will need to purchase
coolers and vermiculite and
pick up supplies at DPNR.
Additional things that need
to be addressed.

- Agreement made at earlier @
EPA meeting that G&M
will escort samples through
customs in P.R.
- Region 2 Chain of Custody
procedures G&M → FBI → G&M.

1600 B/90 setting up on MW-11D.
1620 CME 55 @ decon area.
1630 Leave site for the day.

Susan Collage

Susan Collage

(127)

7/16/92 - Susan Collage

0710 Arrive MW-11D.
5:40 Rig crew set 5' of casing
to minimize cutting during
the reaming process.
0730 Clinton Moffett arrives on site
everyone signs safety tail
gate meeting
0830 B/90, having trouble getting the
hammer started. Depth to water
at this hole is approximately 18'.
0900 B/90 is having problems with
the hammer. Team work will
be delayed while they figure
out what to do about it.
0930 CME 55 still at decon area
preparing to go to MW-1
next.
G&M pouring an equipment
blank. VOA, BNA, Metals, Cyanide,
TPH.
0950 Rig crew inspecting site @ MW-1
prior to mobilization. VITEL Co.
concerned about parking. Several
people will have to park and
walk up to MW-1.

Susan Collage

(128)

7/16/92 - Susan Colligan
1015 CME 55 mobilizing
B 90 Hammer fixed. Rig crew
re-assembles pieces

MW-7	INTERVAL	BLOWS	Recovery	COLOR	Grain Size
TILLET	0-2'	22-33-29-37	1.2'	lite brown	sand and cobble (fill)
	hnu. 8pm	1140lb/hnu	dry soils	and orange	(from surface) little silt/clay
	2-4'	21-24-24-38	1.1'	same	same
	Oppn. hnu				(fill material)
	4-6' (5.33)	27-35-50/3.5"	1.1'	grayish orange	ext. zone by weathered rock (sc. probable) volcanics
	next spoon	50/1.5"	Refusal?		
	6-8' ↑				

1200 Drillers break for lunch.

1230 Resume work on MW-7

hnu 0	8-10'	21-32/5.5"	0.9' 1/4"	"	"
hnu 0	10-12'	50/2"	0.1' 1/4"	"	"
hnu 20	12-14'	78-128/15'	1.2'	"	"
hnu 00	14-16'	42-154/6"	1.4'		

Sample taken @ this interval.

21445 Split spoons taken back to decon area. 14-16' was last spoon taken due to nature of material. Solid refusal still not encountered. GBM grout hole for safety reasons B/90 may not get to it until 6 days.

1510 S.C. picks up all equipment @ DNR
1600 Woolworth's purchases coolers.
Susan Colligan

(129)

7/17/92 - Susan Colligan

0710 MW-11; B-90 finished reaming to 52" and Wanda Morales finished geophysical logging for that portion of the well (hole) yesterday

0715 Depth to water 17.6'

Rig crew will set the casing and grout the hole.

0900 Rig crew finishes putting the casing into the hole.

Weather: Showers and Thunderstorms persist. hot-humid 90°F (approx)

Rig crew waiting on grouting materials and turner pipe.

0919 Turner pipe mobilized in place. Grouting begins.

1018 Wanda Morales goes to GBM trailer to finish up working on geophysical data. As soon as this well is grouted work will be done for the weekend, except some time cleaning up the site.

1035 Grouting complete - 310 gallons

1055 SC to GBM / Soil Tech trailer

Potential schedule for B 90 work will be finish MW-11D; 12D,

Susan Colligan

(13)

7/17/92 - Susan Collage
 7; and 8. The CME 55 will go
 to MW-8 (Mon) then Tuesday
 to MW-6D then if they get to
 it MW-9. This seems to be
 a slight change of plans compared
 to when I last spoke to
 Sally. I will call to
 inform her.

1120 Call Sally Odland to inform
 her of schedule change. We
 will split @ MW-8, MW-6D
 and MW-9 (if they get to it
 this week). No blank this week.

1150 Drive to town to try to locate
 Vermiculite or some sort of
 absorbant packing material
 tried of 32 behind
 pizza hut and Island Block
 west of ball field on 30 - no
 luck. Managers @ both stores
 have never heard of the stuff.

1320 Red Hook - True Value
 no Vermiculite

Susan Collage

(13)

7/20/92 Susan Collage
 0820- SC arrives GBM / Soil Tech field
 office. Weather: partly cloudy,
 90°F, humid.

B'10 rig crew is preparing to
 ream last 20' @ MW-11.

0930 CME 55 mobilizing at MW-8
 in Esso lot.

0950 Begin coring MW-8 - Four Eye Bink
 have Internal Blows Reading Color Grain Size

0.00 ppd 0-2'	12-10-12-16	1.4	Gray & orange	Silty clay (below)	fill asphalt
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0.00 ppd 2-4'	10-9-11-10	1.8	Same	Same	bottom 3" of sample was into new material
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0.01 ppd 4-6'	27-50/5"	1.1	orange	Weak weathered BR fragments	
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0.01 ppd 6-8'	50-53/3"	1.1	orange		
---------------	----------	-----	--------	--	--

0.01 ppd 8-10'	50/3"	0.0	orange		
----------------	-------	-----	--------	--	--

1105 Split sample taken from 2-4'
 Spoon. Spoon was full and
 this location was a transition zone
 between what appears to be a
 grading fill to very weathered rock

Susan Collage

(132)

7/20/92 Susan Collage
1115 B-90 finished @ MW-11D.

To decon. area - rig crew begins to set up on MW-12D - compressors, etc...

CME-55 will set up @ decon.
next proposed location will be MW-6D @ 4 Winds plaza.

Note: when split sample was taken, jars were filled directly from the spoon VOA's; MTBE; BNA; TPH; Metals, Cyanide.

No sample homogenization took place. no homogenization. Our Brossman says homogenize. however I cannot locate in GBM work plan where it says to homogenize.

1200 Break for lunch

1300 GBM office

1410 Call Sally Odland to let her know about sample homogenization discrepancy. She will check into it.

1530 Check Ocean Realstate office
no Fed Ex Package.

Susan Collage

7/20/92

- Susan Collage

(133)

Contact Don Dinsley FRC
Easton to inquire about staying
an extra week, probably yes.
Will get Bill Holden to cover
my RTI deliverable due Wed.
7/29/92.

1610 Stop by decon area. Both
rigs and tools being decon.

1630 Stop by MW-11D Clinton and
Wanda are conducting geophysical
logging for last 20 feet
of the hole.

1645 Call Ocean realstate office
Fed Ex never came by today.
Tried to reach Sally but
she's gone. Left message on
her home phone answering
machine to let her know
we'll need a tracer on the
package and to get guidance
on homogenization issue.

2010 Spoke to Sally at home. Yes everyone
should be homogenizing prior to
filling the sample jar. Refer
Clinton to Addendum to 10/1/92 memo.

Susan Collage

(137)

7-21-92 Susan Collage

0720 - On site. Weather clear, sunny
~ 85-90°F. light and varied breeze,
Both rig at decon area.

0830 Meet ~~4~~ ⁵ winds representative at
Texaco Ana Gloria Ramos invest. com. center.

0845 Call Federal Express @ Airport
to try to trace package using
name. 774-3393 No manifests
found.

0930 Mobilize on MW-6D @ Four
winds in front of V.I. Furniture
Clinton Moffett arrives on location
has rug moved over ~ 15' East
to a more appropriate location.

1050 About to begin hammering first
spoon. No stainless steel bowl
yet. I go w/ Cliff to purchase
one. He decons bowl @ Texaco
decon area.

hrs	Interval	Box	Recovery	Color	Grain Size
0.0 ppm	0-2'	18 10 12 19	1.6'	Brown- Gray stiff-Dr	Asphalt 0.3' silty clay traces
0.0 ppm	2-4'	10, 7, 11, 12	0.8'	Same as above	Same as above
0.0 ppm	4-6'	5, 55, 135	0.0-	spoon bent no sample recovered	

510

Susan Collage

7 21 92

Susan Collage

(138)

Location	Sample	Tag	Analysis	Decon	Remarks
TUL-MW- Q	BHR65	10762, 63	VOA	7/20/92	2-4' internal
	73828-01-01	10765, 66	MBE, n.P, 120		
	73820-02-01	10769	TPH	(1015)	
	BHR65	10764	BNA		
	MBES56	10736	Metals		
	MBES58	10737	Cyanide		
2 TUL-MW- bD	BHR64	10603, 04	VOA	7/21/92	0-2' internal
	BHR64	10605	BNA		MS/HSD
	MBES57	10738, 39	Met./Cyan.	(1500)	
	73828-02-02	10740	TPH		
	73828-01-02	10746, 68	MBE etc		
	73828-01-02	10767, 68			

Susan Collage

Susan Collage

(136)

7/21/92 - Susan Collogan

1140 4.6' Spoon bent. Basket missing resulting in no recovery. Spoon contents fell back into the hole

1200 Break for lunch

1245 Contact Sally Odland @ FPC. Tracer put on Fed Ex shipment (Acids and CUP paper work) tracer shows that packages will reach this destination by close of business. Reported that G&M will homogenize on split samples, however, they will continue sampling in the same manner for all other split spoon samples that will not be shared w/ FPC (sample taken directly from the spoon for all analyses)

1300 Return to Site (MW-6D) G&M/Soil tech rig crew is putting up a temporary fence per the requestst of And Gloria Ramos. One condition

Susan Collogan

(137)

7/21/92 - Susan Collogan

for performing work at 4 Winds so that the work area be securely fenced off. Orange cones and Caution tape were not sufficient.

1403 Rig crew prepares to start sampling on new hole (#1 for over) Ana Gloria Ramos informs me that another condition for working @ 4 Winds is that "no work be done during the weekends on a Virgin Island Holiday" and Monday July 27 is a V.I. Holiday, therefore no drill work will be done.

Interval	Blow	Recovery	Color	Grain	Size
0-2'	12-20	50/6" 1.3	Same	Asphalt 3"	
2-4'	50/6"	0.0'	Same	As first spoon pg 134	

Top of Bedrock this hole 2.7'
Split taken on 0-2' interval
No recovery on 2-4' spoon

1545 Pick up paperwork - No acid

1900-2200 CUP paper work in prep for tomorrow's shipment.

Susan Collogan

(138)

7/22/92 - Susan Colligan

0730 Arrive MW-8 Rig crew preparing to core - waiting on water.

0830 Call Vasu Desikan to check on a few questions regarding paper work for CLP shipment

0915 Back @ MW-8.60 Speak to Clinton Moffett regarding sample shipment. He suggests I make a copy of each U.S. DA permit and include it with the air bill as well as writing the permit number on the air bill itself.

0940 Go to penny saver printing in Tilton to have copies of USDA permits made

1000 MW-8 coring in progress
Fracture zones @ 3; 3.6;

5.6; 6.2'

Run #1 2.6-5.5' Penetration = 2.90 feet; 11 minutes; Rate - 0.26 ft/min; Down pressure 200 psi; Recovery 48%; RQD - 45.

Susan Colligan

7/22/92 - Susan Colligan (139)

Run #2 5.5-10' Penetration 4.5'; Run duration 7 min; Penetration rate 0.64 ft/min; Down pressure 300.0 psi; Recovery 1.9'; Percent 12%; RQD 29.0Rock description Volcanic rock grayish green to dark greenish; moderately strong; fine to medium grained; slightly altered; slightly weathered.

1105 Go to Airport Fed Ex to Ship samples. They made 3 copies of the soil permits for each shipment.

1200 Attempt to call Sample Management office to report RAS and SAS shipments, both Jonathan Rude (RAS) and Steve Hilger (SAS) were unavailable.

Called Sally Culland to inform her of the shipment, and discuss other points about the project.

1340 Arrive back to MW-8.60

Susan Colligan

(140)

7/22/92

Susan Collage

Run #	Depth	Penetration	Duration	Rate	Pressure	Recovery
1	10-15	5.0	12	0.42	50-100	1/20/0
4	15-20	5.0	12	0.29	150	1.7/34/0
5	20-25	5.0	31	0.16	150-200	.8/16/0
6	25-30	5.0	38	0.13	200	2.0/40/0
7	30-35	5.0	24	0.21	100	0.0/80/30
8	35-40	5.0	28	0.18	150	2.5/50/26
9	40-45	5.0	25	0.20	100	4.2/84/46
10	45-50	5.0	17	0.29	100-150	4.2/84/39
11	50-55	5.0	17	0.29	150	5.0/100/45
12	55-60	5.0	33	0.15	100	4.5/90/63
13	60-65	5.0	24	0.21	100	5.0/100/84

~~Susan Collage~~

10-15' - Moderately altered fracture zone (crushed)

15-20 Very altered fracture zone (crushed)

Susan Collage

7/22/92

Susan Collage

(141)

20-25 Moderately altered fracture zone
 25-30 Mod alt fracture zone (crushed)
 300-30.8 Moderately altered fracture zone (crushed)
 31.8-33.3 Competent rock
 33.3-34.5 Mod altered fracture zone (crushed)
 37.5 Competent rock
 37.5-40 Mod alt. frac zone (crushed)
 40-45 - 40.0-41.1 Competent rock slightly altered fracture zone (Moderate fracture)
 41.1-41.9 (crushed) 41.9-42.7 Fresh rock 42.7- slight mod altered fracture zone - crushed

1750 Meet Clinton Muffett and Wanda Morales at MW 120 D where they are doing geophysical logging. Today they finished running down to depth to bottom 30" Depth to water 26". Casing will be installed to maintain 4" all the way to bottom of the well.

1900 Leave MW 120.

Susan Collage

(142)

0715

7.23.92 Susan Collage
Arrive MW-6D. Depth to water
8.4'. Drillers resume coring
@ 50'.

50-55' 52.2-53.3 slightly to
moderately fracture zone (crushed
fractures occurring @ 50.4, 51.1, 51.5, 53.8)

55-60' Fracture zone from 55.0-55.4
(crushed) moderately altered. Moderately
altered fractures @ 56.1' and 57'
Slightly altered fractures @ 57.3'
and 58.6'

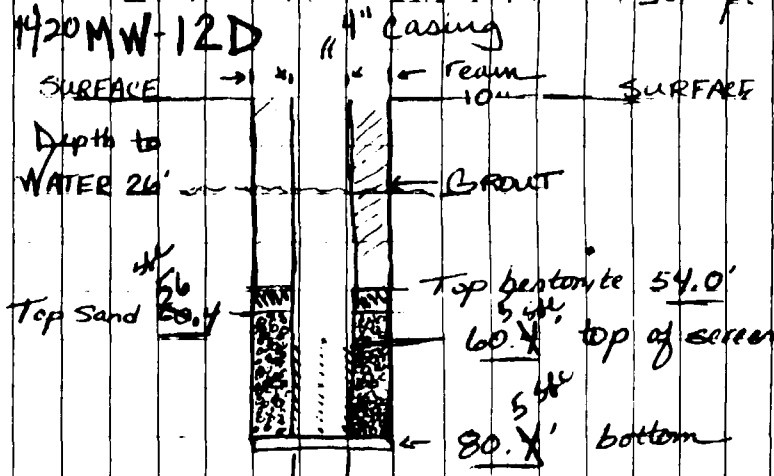
60-65' Mod Altered fracture @ 60.9'
Slightly altered fracture zone 61.5';
62.1'; 62.6'; 62.8'; 63.9-4.2 mod
alt fracture zone (crushed) 64.8 mod alt fra.

0944 Finish coring @ MW-6D. Rig
crew will break down and decom.
* B-90 rig crew finished re-reaming
12D to get the bottom of the
hole cleared out. 4" casing
was installed all the way
to bottom. The walls of the
hole are unstable and do not
contain competent rock.

Susan Collage

(143)

7.23.92 - Susan Collage
1100 - Drive into town Purchase
2 18 Quart boxes @ Woolworth
Attempt to locate Rainers cabinet
shop on sub base to pick up
some saw dust for packing
and shipping samples with
1330 - Arrive Teraco decon area found
CME 55 still in decon area
Rubin Torciano mentions that
he will be going to the police
station to check on MW-9 set up



the well was special case due to the
highly weathered, highly fractured rock
no coring past 65'

Susan Collage

(144)

7/23/92 - Susan Colligan

Today's weather - partly
cloudy 80-90°F

1600 Leave site

2000-2200 Prepare bottles and paperwork
for tomorrow morning
split sample @ MW-9.~~Susan Colligan~~~~Susan Colligan~~

Susan Colligan

7/24/92 - Susan Colligan

(145)

0710 Arrive MW 9. Dick crew
is setting up the exclusion zone
(temporary fence) around rig.0800 Clinton Maffei and Nanda Morales
pour another equipment blank
for today's sampling activities.Spoke to Clinton about fax
sent by Sally Odland yesterday.* Per EPA request they would
like for us to do a reconnaissance
of the Tillet Property for potential
surface soil sampling activity.
Clinton mentions early afternoon
today will be a good time to
do that.

0810 Drillers driving second spoon

17'	0-2'	16-22-74-76	1.8	brown reddish brown	Clay - rock frag mud coarse sand
-----	------	-------------	-----	------------------------	-------------------------------------

25'	2-4'	9-23-21-30	1.1	same	same
-----	------	------------	-----	------	------

1-6' none

~~Susan Colligan~~

Susan Colligan

Station	Location	Sample #	Tag #	Analysis	Date/Time	Remarks
G	NW	BHR63	10741,2	VOA	7/24/92	0-2' and 2-4' intervals
		BHR63	10743	BNA		
		7382B-01-03	10745,6	MTBE...	C1030	25 PPM hmm peak
		7382B-02-03	10747	TPH		
		MBES56	10744	Metals/Cyn		

7-24-92 Susan College

1/TBE sample and VOA sample taken separately out of 2-4' spoon. One deviation is TPH was taken after homogenization as GBM didn't take there until this point. This was done to help ensure comparable data deviation is from CDM FRC Froegman. Paper work completed and samples packed and strapped.

1130 Stop by GBM office meet Clinton and Wanda. Clinton asks me to give him a call after dropping samples at Fed. Ex to arrange for Tillet walk over. Wanda gives me final information for wells installed so far from boring logs. Additionally,

Susan College

7-24-92 Susan College

Wanda informs me that B90 crew finished installing MW-8 (Esso) late last night. Workers decided late that they wanted to work late and take the day off tomorrow, today.

1215 Ship samples from Fed Ex, Airport location

1300 Try calling Clinton Moffett @ GBM Trailer regarding Tillet walk around. No Answer

1345 Arrive GBM office. Vacant.

1410 Leave GBM office

1420 Pick up acid shipment @ Ocean Property Management. Jennifer Jones informs me that all phones on the east end of the island have ~~not~~ not been working since ~1030 AM.

1430 Drive to Fire Station. Phones down @ this location as well.

Susan College

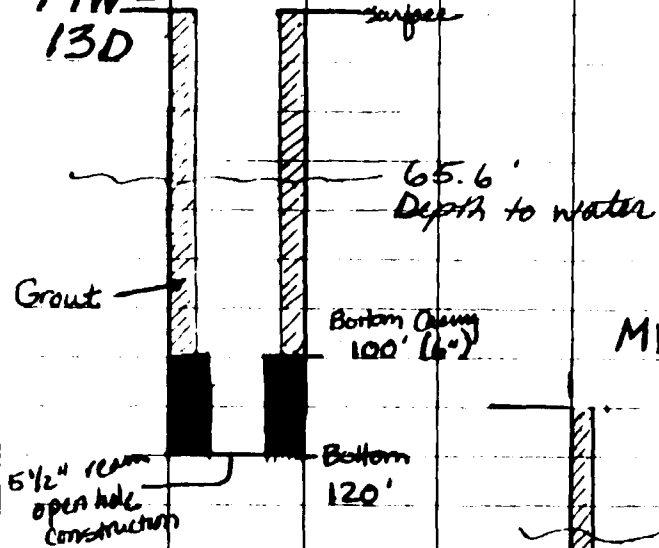
Susan College

(148)

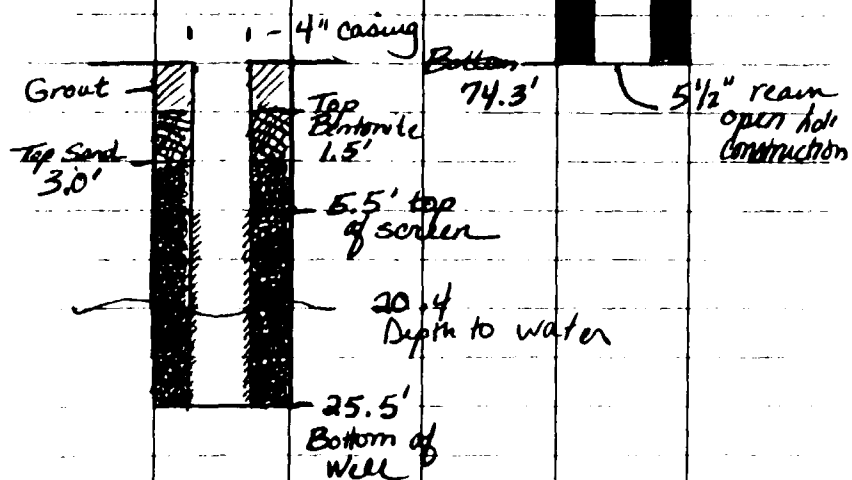
7/24/92 -

Susan College

MW-13D



MW-8



Susan College

7/28/92

Susan College

(149)

Run	Depth	Penetration	Rate	Pressure	Flow	%	Remarks
#1	52-10	4.8	10	0.48	100.0	1.6	33
#2	10-15	5.0	5	1.0	100	0.4	8
#3	15-20	5.0	12	0.36	1.0	1.0	20
#4	20-25	3.0	20	0.34	100	1.3	31
#5	25-30	4.20	35	0.13	100	1.6	31
#6	30-35	2.6	13	0.20	100	2.5	96
#7	35-40	4.0	26	0.15	150	4.0	100

0920 Clinton Maffett arrives on site. Ask him about Tillet walkover. Says he'd like to do it this afternoon 1330. Ask Clinton for an update on the schedule to get some idea where split samples can be obtained this week. He must go to the office to get a better picture however knows MW-10D will be next.

1010 HNL readings taken @ hole. Breathing zone 0 ppm. Readings @ hole equal 10-15 ppm. Clinton Maffett checking readings at hole intermittently. Weather: Clear, Sunny, 85-90°F.

Susan College

(150)

7:28 92 - Susan Callaghan
 LME^{37C} B-90 is on location at
 MW-7 on Tillet Property.

1050

Call Sally Odland. Inform
 her of project progress and
 about communication difficulties
 on Friday (all phone lines down
 on east end of the island). Received
 all acids except H_2SO_4 . Need
 additional pieces for HNU
 calibration kit (pressure gauges
 Tygon tubing and T-valve).

Sally gave me new RAS
 labs for this week. VOA/BVA
 will continue going to compu-
chem under a new case #

(18544). TAL Metals and
 Cyprade will go to EPA
 ESD Laboratories in Edison, NJ.

1200

Go to Apt check for H_2SO_4 - none
 in vermiculite.

1210

Call Sally to inform her.

1230

Drove to Secret Harbor View villas
 to pick up Jay and straighten away
 Key situation for Mark G's arrival.

1230-1300 Lunch

Susan Callaghan

(151)

B10

7:28 92
5:2-10
6-5

Susan Callaghan

Fluctuated back wide 5.7, 5.11,
 6.8. Mod altered

10 15

Highly altered fracture zone (cracks)
 pockets of ^{up}consolidated material
 (clay silt)

1520

Same as above

20 25

Slightly altered fracture zone (cracks)

25 30

Slightly altered fracture zone

28 31

Slightly altered fracture zone

31 35

Slightly altered fracture zone

1430

Dillers prepare to ^{sc}demobilize
 at MW-9.

1500

S.C. goes to Tillet Property
 w/ Clinton Moffett to map out
 suitable surface soil sample
 areas. Several areas between
 parking area and shops were
 noted and marked on a map
 for Tillet Garden Area.

1610

At G&M / Soil tech office
 Fax apartment info. to
 Mark Greany and fax Tillet
 walkover map to Sally.

1640

Leave Se

Susan Callaghan

Station	Location	Sample #	Tag #	Analysis	Date / Time	Remarks
4	FB01	3HR69	10732, 23	VOA HCE	07-29-92	Split of Field blank
	2992	7352B-01-04	10735, 27	MTBE... HCE	92 @	on Spoon prior to MW-100 boring
		3HR69	10724, 35, 26, 27	BNA	0830	
		105429	10730	Metals		
		105429	10731	Cyanide NaOH		
		7352B-02-04	10732	TPH		
5	B-9	3HR68	10734, 35	VOA	07-29-92	4-4
		3HR68	10758	BNA	92 @	4-6
		7352B-01-04	10735, 27	MTBE...	1400	
		7352B-02-05	10759	Met/Cy...		
		7352B-02-05	10760	TPH		

7-29-92 - Susan Collagen

0710- SC.
arrive - 10:40.
CME-55 Decon
SC. Finishes
preparing
glassware

Weather:
clear, sunny
85-90° F.

Sample eliminated SPC

7-29-92 Susan Collagen

0830 - Four Field blank-FPC taking
split. Method: GGM alter-
nated filling of their sample
bottles w/ that of FPC sample
bottles.

Acids/Preservatives:

HCE/MTBE and VOA - 5
drops added before sample
taken. PH < 2

(NaOH) - Cyanide - 9 pellets
PH = 13 (712)

(HNO₃) - Metals ~ 2 ml
PH < 2

(H₂SO₄) - TPH - poured from
a GGM preserved TPH
bottle ~ 2 ml pH < 2

0850 GGM/soil Tech having access
problems to car wash location
MW10D. Clinton Moffett will
make calls. They may go
to MW SPC B-9 (K1 Furniture)
first.

0945 - Call Sally Oakland. Update
her on potential schedule

Susan Collagen

(154)

7-29-92 - Susan Collegen
for today. She will take
splits from B-9 and 10D
if available, however will
not take splits from MW-6
or MW-10.

0955 Call Vasa Diskin. Need
USDA permit for EPA
Laboratory. She'll fax
it to Ocean Property
Management.

1005 B-90 demobilizes @ MW-9^{see}
and arrives Texaco for decon.

1150 Drive to Ocean Prop. Mgt.
@ Secret Harbor to pick up
fax of U.S.D.A. permit for
EPA Lab

1230 Lunch

1300 Arrive B-9.

Interval	Blow	Pen.	Color	Grain Size
0-2'	10-15	4-10	1.4'	dark gray to reddish brown
2-4'	10-12	8-9	0.5'	SAND
4-6'	5-8	50/1.5"		SAND

Full clay sand
silt little
rock trace
sand (grace)

Susan Collegen

(155)

7-29-92 - Susan Collegen
1410 - refusal encountered @
5 feet - Begin demobilizing.
* Grout open hole.

Notes B-90 is Mobilized at MW-9
~~Reaming is in process~~. ^{the} preparing beam

1450 GEM / Soil Tech office. They
are still having access problems
@ car wash area (MW-10;
MW-10D). They may have to
work odd hours to avoid
conflicts. GEM may begin
borings near cor' building
tomorrow.

1530 Contact Mark Greany @ RFE
NY to give him information
about project and apartment.

1550 Wanda Morales informs me
about B-90 progress at
MW-9. Reaming will begin
tomorrow.

1630 Leave Site

Susan Collegen

Susan Collegen

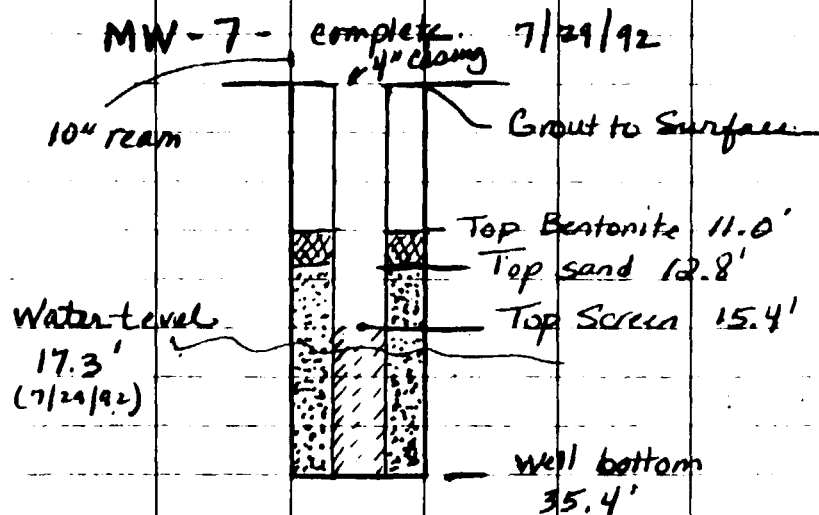
(156)

7/30/92 - Susan Collage

0700 Arrive Texaco

0720 Clinton Moffett and Ruben Ponciano drive up to Curriculum Center to stake out first boring location B-6

0730 CME-55 begins mobilizing @ B-6.



flush mounted.

Susan Collage

Susan Collage

7-30-92 - Susan Collage

(157)

hru	Interval	Blows	Recovery	Color	Grain Size
	0-2	25-20-11-12	1.2	Brown to dark Brown	Silty clay 3m' mud rock frag. trace sand & organic
25ppm	2-4	9-8-9-12	1.4	Same	Same w/
100ppm	4-6	6-10-11-9	1.3	Same	Some black layers of peat (0.4')
50ppm	6-8		1.4	Same	0.4' highly silty rock.

Bedrock @ approximately 7.3'

0930 Finish this hole. Grubbers are grouting the hole.

1000 SC goes to GBM field trailer to update paperwork.

1050 Call Sally Odland. Sally would like to get B6 and B1 and eliminate B9 sample if possible

1130 Mobilize at B1

hru	Interval	Blows	Recovery	Color	Grain Size
50ppm	0-2'	4-3-4-4	1.1	light brown red	Silty clay trace sand
32ppm	2-4'	4-3-4-5	1.3	Same	Same
39ppm	4-6'	6-11-8-6	1.5	"	"
62ppm	6-8'	6-5-6-5			
42ppm	8-10'	6-5-8-25			
	10-12'	50/4"			

Susan Collage

Station	Location	Sample #	Tag #	Analysis	Date/Time	Remarks
6	B0	BHR67 BHR68 BHR69 BHR70 BHR71 BHR72 BHR73 BHR74 BHR75 BHR76 BHR77 BHR78 BHR79 BHR80 BHR81 BHR82 BHR83 BHR84 BHR85 BHR86 BHR87 BHR88 BHR89 BHR90 BHR91 BHR92 BHR93 BHR94 BHR95 BHR96 BHR97 BHR98 BHR99 BHR100	20746.6 25749 28747.98 28750 10755 20740.41 28744 28742.43 10746 10606	VOA BNA MTBE MCH/Cyph TPH VOA PNA MTBE MCH/Cyph TPH	7/30/92 7/30/92	(158) VOA 4-6' spoon Homogeneous 4-6' and 6-8' Sasam Collagen 300-VOA Sample collected from 4-6' spoon, all other samples were collected by combining 4-6' and 6-8' spoon. 1110 - Purchase 12, package samples for shipment. 1615 - Arrive FedEx ship samples. 1745 - Finish leave site
7	B1	BHR67 BHR68 BHR69 BHR70 BHR71 BHR72 BHR73 BHR74 BHR75 BHR76 BHR77 BHR78 BHR79 BHR80 BHR81 BHR82 BHR83 BHR84 BHR85 BHR86 BHR87 BHR88 BHR89 BHR90 BHR91 BHR92 BHR93 BHR94 BHR95 BHR96 BHR97 BHR98 BHR99 BHR100	20740.41 28744 28742.43 10746 10606	VOA PNA MTBE MCH/Cyph TPH	7/30/92 7/30/92	Homogeneous 4-6' and 6-8' Sasam Collagen 300-VOA Sample collected from 4-6' spoon, all other samples were collected by combining 4-6' and 6-8' spoon. 1110 - Purchase 12, package samples for shipment. 1615 - Arrive FedEx ship samples. 1745 - Finish leave site

CURVE TABLES

HOW TO USE CURVE TABLES

Table I. contains Tangents and External to a 1° curve. Tan. and Ext. to any other radius may be found nearly enough, by dividing the Tan. or Ext. opposite the given Central Angle by the given degree of curve.

To find Deg. of Curve, having the Central Angle and Tangent: Divide Tan. opposite the given Central Angle by the given Tangent.

To find Deg. of Curve, having the Central Angle and External: Divide Ext. opposite the given Central Angle by the given External.

To find Nat. Tan. and Nat. Ex. Sec. for any angle by Table I.: Tan. or Ext. of twice the given angle divided by the radius of a 1° curve will be the Nat. Tan. or Nat. Ex. Sec.

EXAMPLE

Wanted a Curve with an Ext. of about 12 ft. Angle of Intersection or I. P. = 23° 20' to the R. at Station 542 + 72.

Ext. in Tab. I opposite 23° 20' = 120.87
120.87 ÷ 12 = 10.07. Say a 10° Curve.

Tan. in Tab. I opp. 23° 20' = 1183.1
1183.1 ÷ 10 = 118.31.

Correction for A. 23° 20' for a 10° Cur. = 0.16
118.31 + 0.16 = 118.47 = corrected Tangent.

(If corrected Ext. is required find in same way)
Ang. 23° 20' = 23.33° + 10 = 2.3333 = L. C.

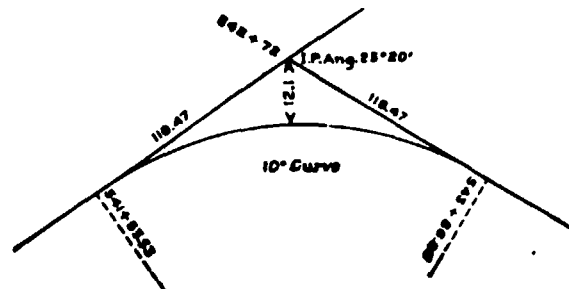
2° 19½'	= def. for sta.	542	I. P. = sta.	542 + 72
4° 49½'	= " " "	+ 50	Tan. =	118.47
7° 19½'	= " " "	543	B. C. = sta.	541 + 53.53
9° 49½'	= " " "	+ 50	L. C. =	2.3333
11° 40'	= " " "	543 +	E. C. = Sta.	543 + 86.86
		86.86		

100 - 53.53 = 46.47 × 3' (def. for 1 ft. of 10° Cur.) = 139.41' =

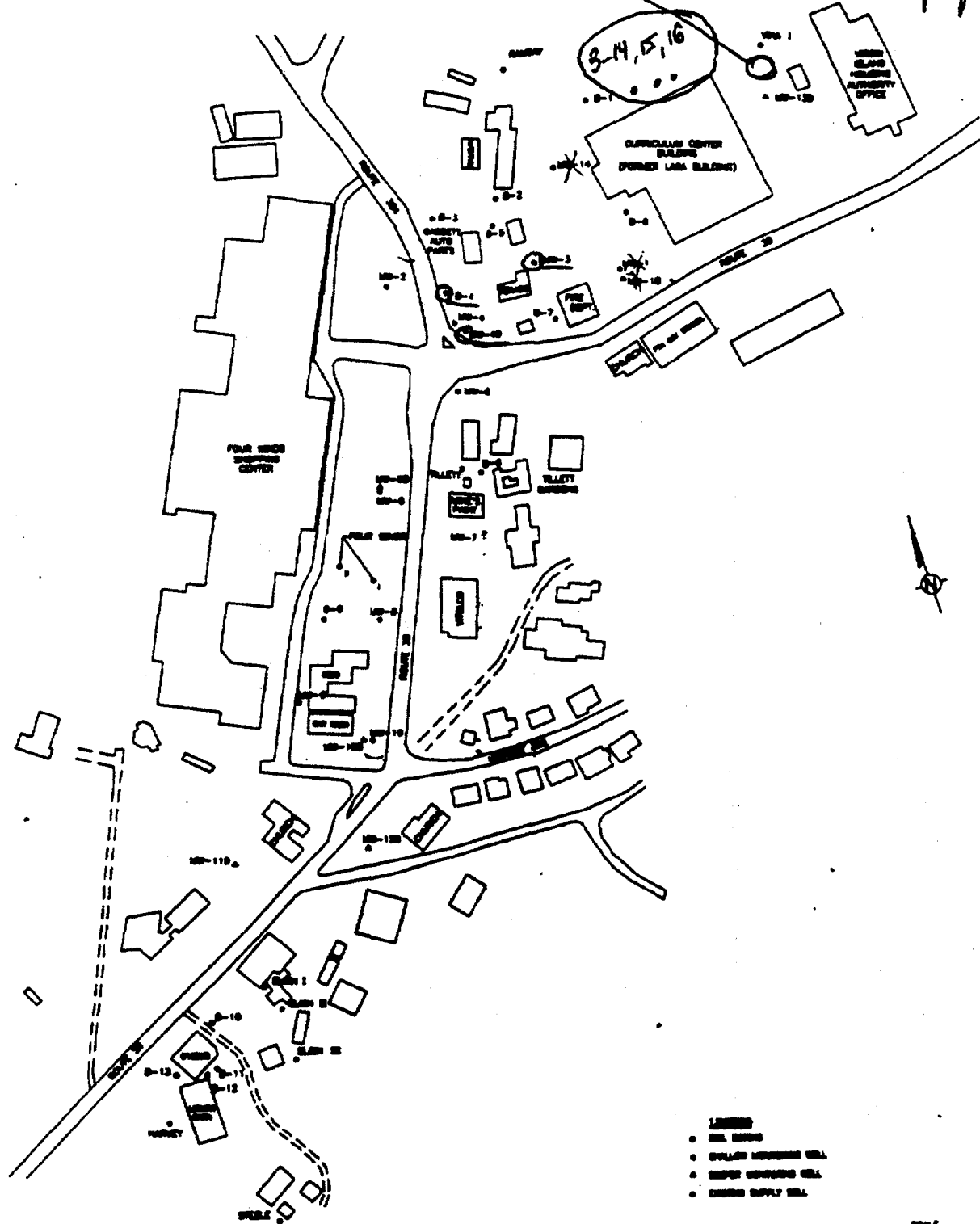
2° 19½' = def. for sta. 542.

Def. for 50 ft. = 2° 30' for a 10° Curve.

Def. for 36.86 ft. = 1° 50½' for a 10° Curve.



Location of WAPA water supply stand pipe



**Tuta Wells Superfund Site
St. Thomas, U.S. Virgin Islands**

[illegible]

7-31-92 - Susan Collage

Weather: Clear, Sunny 85 90°F
Clinton Moffett updated activities that occurred yesterday.

Rig crew will clean up and
decon equipment today

* CME-55 finished w/ B-6 yesterday and will complete B-7 (Fire Station) this morning

<u>Loc</u>	<u>Interval</u>	<u>Bloms</u>	<u>Recov</u>	<u>Color</u>	<u>Grain Sz.</u>
0.0	0-2'	22, 98, 16 13, 50/sec	1.5	light brown	fill silt rock fragments
0.0	2-4'	23, 45, 17, 25	1.3	"	trace fine gr sand

Drill Rig was moved twice. First because auger was advancing at an angle forward the less stable drainage ditch - Second time they hit a bolder.

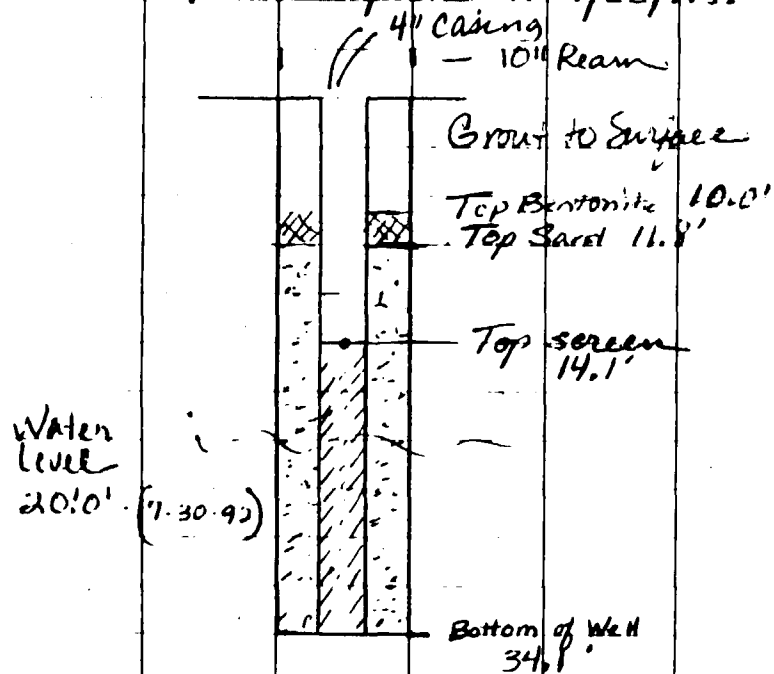
0830 Return to GOM Soil Tech
office. Phone in Sample shipment
from 7/30.

0915. Return B-7. Auger refusal @
4'. G & M will collect from 2-4'.

Susan Calver

② 7-31-92 - Susan Callaghan
1000 - Return to G&M soil tech.
field office

MW-9 - complete on 7/30/92.



Was unable to obtain all info
from Robin P for BI # (157).
Wanda does not have time to
get geophysical together before
I leave. Will ask Mark G.
to get it while he is here.
1105

Susan Callaghan

Monday August 3, 1992

Mark Grelang

0830 On-site at G&M office
w/ Clinton Moffet of G&M.
Discussing plans for
coming week(s).

B-20 scheduled to return
at MW-6D by day

CME-55 scheduled to
begin coming at MW-10 location.
This location is near car-wash
therefore drilling activities
restricted to night-time hours.

Weather: Clear, hot 85-90
variable breeze

Monitoring instrument:

HNU P101 EPA #464278
Calibration 7/23/92 by RJA
Span 5.0 65ppm Calgas 100ppm
11.7er probe ISO 5

CME-55 performing savings
B-2 and B-3
This morning near
Jeep dealership. 611g
M8

④ 8/3/92 Mark Greaney

Boring B-2

completed to depth of ~3.3 ft
no HNu reading above background
background = 0.2 ppm
auger & spoon refusal
at 3.3 feet
sample collected by G&M
no split taken

Boring B-3

completed to depth of ~3.3 ft
slight HNu reading observed
0.2 reading observed
background = 0.0 ppm
auger & split spoon refusal
at 3.3 feet
sample collected by G&M
no split sample taken.

Borings B-2 and B-3
are closed by filling/grouting

1200 attempting to get
access approval to
perform boring B-13.
Mark Greaney

Mark Greaney 8/3/92 ⑤

1200 cont. MB
B-90 is set w/ large
diameter PVC casing is set
to ~3 ft depth for the
purpose of controlling
dust and water surge
while reaming. This
is done at MW-6D
where B-90 is now
located. casing will be
allowed to set overnight.

1400
access not obtained for
boring B-13.
Split sampling will be
done next week
when CM9-55 completes
MW-10D and MW-10.
Split samples to be taken
from borings at
Tillet Gardens
and O'Henry areas.

1500
returning to condo to
address supply situation.
Mark Greaney

⑥ 8/3/92 Mark Greany

1630

finished organizing
for next weeks samples
done for day

~~8/3/92~~

Mark Greany 8/3/92

8/4/92 Mark Greany ⑦

1000

Weather: Clear, Hot 85-90°
variable breeze

beginning oversight at
"staggered" time due to
anticipation of drilling
activities tonight.

3-90 rods are being
tripped out due to plugging.
Difficulty in tripping out
rods. Reaming complete
to only 35-40 feet
Reaming will be performed
here prior to geophysical
logging. This change
implemented due to
difficulty getting geophys-
ical instruments to
descend 3" diameter
"cored" hole. Discussed
this change w/ Sally Olland
OK - geophysics after
reaming but always
before grouting.

Mark Greany 8/4/92

⑧ Mark Greaney 8/4/92

B-90 activities at MW-6D
stopped due to leak
in hydraulic system.
Repairs will be performed
tomorrow. Only minor
amount of hydraulic
fluid is released and
all is immediately
cleaned up with
absorbent pads. No fluid
got near the bore-hole.
Activities here complete
for the day. Activities
will resume at MW-10D
tonight at ~ 6:30 PM.
1400 - returning to condo

1830 - at G&M office w/
Clinton Moffet of G&M
preparing to go to car-wash
location to do borings
for MW-10D and MW-10.

1930 Drilling begins at
car-wash location.

Mark Greaney

Mark Greaney 8/4/92 ⑨

2000 Drilling MW-10
auger through ~ 6 inches
of asphalt to begin.
0-6" asphalt
Split spoon #1 driven

~~0-6"~~
0.5-2.5 feet (G&M 0-2)
15, 33, 27, 35 blow count
1.5 foot recovery
fill, silty clay, little sand
little rock fragments
grey to brown

Split spoon #2
2-4 feet
21, 50 blow count (11" advance)
auger & spoon refusal
~1.4 ft. recovery (previous
cuttings)

auger & spoon refusal
Top of bedrock at ~ 3.0 b/s
sample MW-10
collected from 2nd spoon
slight HNA reading recorded 2nd spoon
0.2 signal 0.4 recorded briefly.

Mark Greaney

⑩ Mark Greany 8/4/92

Ris moved N 4 feet toward road

MW-10D

14,9,33,50 - flow count
auger through top 6" asphalt
1.5 feet recovery

sample collected here.

MW-10D - sample number
now installing short piece
of casing to serve as
part of the drilling fluid
recirculation system.

for tomorrow's drilling
(coring at MW-10D)
now also grouting up bore
hole at MW-10. Will use

B-90 later to install
MW-10 at this same
location (will ream/air drill
past grouted up section
(through)).

Clifton preparing field blank
to accompany these two
samples.

Also preparing paperwork
& packaging for shipment
Mark Greany

Mark Greany 8/4/92 ⑪

tomorrow morning.
1100(PM) sample packaging
completed - done for the
evening.
Coring at MW-10D to
begin tomorrow night.

~~Mark Greany~~
~~8/4/92~~

Mark Greany

②: Mark Greany 8/5/92

1100 - beginning late due to night drilling activities planned for this night. Checking up on reaming activities on-going at MW-6D using B-90.

B-90 down-the-hole hammer is not ~~found~~ ^{not} functioning properly. Repair to hydraulic system made this AM. Now air pressure down hole not sufficient tripping out rods to investigate problem.

1230

Breaking for the afternoon will return ~ 6:30 to scene. CMR-SS coming to location MW-10D. Night drilling will be performed to avoid interference with car wash operation.

~~Mark Greany~~

Mark Greany 8/5/92

Mark Greany 8/5/92 ③

1830 6:30 pm

Clinton Moffet of GFM informs me that MW-6D was completed as a shallow well due to collapse of large void at ~7-8 ft which prevented sufficient air pressure development to operate B-90 down-the-hole hammer. Clinton Moffet was not present for well construction and is not certain whether a grout plug of cored-section was installed. Clinton Moffet believes that sand was added down hole and then screen set from 24' to 4' bts. Wanda Morales of GFM was ~~in~~ ^{was} in charge of operations using the B-90 at this time. She is not available to provide information at this time will follow up on this matter tomorrow.

Mark Greany

⑭ Mark Greany 8/5/92

0730 PM - 1930

preparing to begin coring
CORING MW-10D
at car-work location
(requires right-time drilling)
setting up rig.

will begin coring with
drill diamond bit from
a previous well.

Two large halogen lamps
are being powered by
portable generator (same as last night)
Area is also fairly well lit
by N5 nearby street lamps.

2030 (1830 PM)

coring begins

Run #1

2.25' to 4.65 ft = 1

4.65' to 5.0 ft = 1A

rock descriptions will be
made subject to poor light
conditions - ie difficult to
assess the nature of fractures

Runs 1 & 1A completed in
31 and 1 minutes respectively

Mark Greany

Mark Greany 8/5/92

⑮

MW-10D		penetration	time	recovery
Run	Interval			
1	2.25-4.65	2.40	31	2.40
1A	4.65-5.0	0.35	1	0.30
2	5.0-8.2	7.2	38	2.3
2A	8.2-10	1.8	13	1.5
3	10-13	3.0 (150psi)	17	3.0
3A	13-15	2.0	17	1.4
4	15-19	4.0	28	2.3
5	19-22	3.0	22	3.0
6	22-25	2.0	17	
7	25-27	2.0		
7A	27-27.3	- broken pieces		
7B	27-28.3	1.3 (N 90°)	4	1.3
7C	28.3-30	1.7	9	1.65
8	30-33.5	3.5 (N 45°)	24	3.5
8A	33.5-35.0	1.5 (N 102°)	7	1.5
9	35.0-40.0	5.0	30	4.8
10	40.0-44.8	4.8 (250psi)	18	4.8
11	44.8-49.6	4.8 (200psi)	17	4.8
12	49.6-51.4	1.8		

⑥ Mark Greany 8/5/92

Table on p. 15 will be filled progressively.

2200

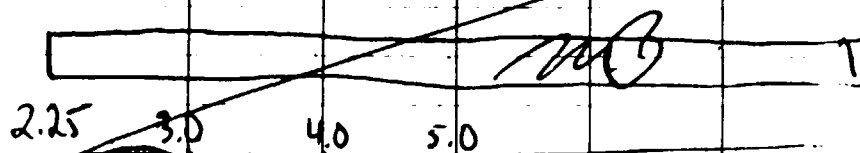
just removed first portion of 2nd run.

5.0 - 8.2 feet see table p. 15

Descriptions

Run 1: 2.25 - 4.65

~~MB~~



Run 1

weathered



weathered & contains clay material

Run 1A

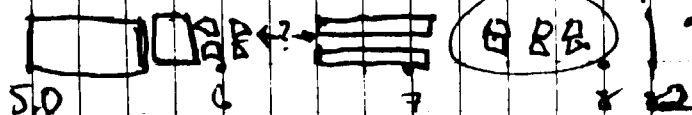
+ broken pieces
4.65 5.0

Mark Greany 8/5/92

Mark Greany 8/5/92

⑦

Run 2

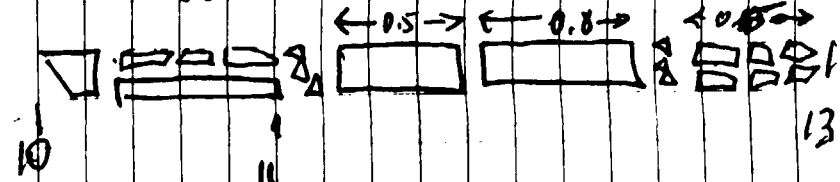


broken pieces w/ calcite deposits

Run 2A (8.2 - 10)



Run 3 (10 + 13)



Run 3A

all broken pieces 1 (of rock)
15 w/ calcite deposits
largest piece ~ 2 1/2 inches
no full diameter pieces



Mark Greany

⑧ Mark Gneary 8/5/92

The rock here has larger particles than rock at MW-4D. Ruben Ponciano of G&M describes rock as volcanic sandstone. The rock looks to be fairly competent, no major fractures or areas of weathered rock encountered thus far (15 feet S/S). However this rock seems to break into pieces quite easily. Small 'hairline' fractures may exist throughout, but as stated above - no major water bearing zones evident to current depth 15 feet S/S.

2340 beginning core run #4
Water recirculation continues to be quite good - this indicates that no major fractures have been encountered.

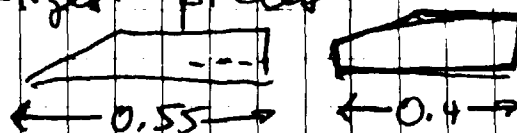
BEGINNING 8/6/92 (midnight)
starting 1/ next page

Mark Gneary

Mark Gneary 8/6/92 ⑨

0001

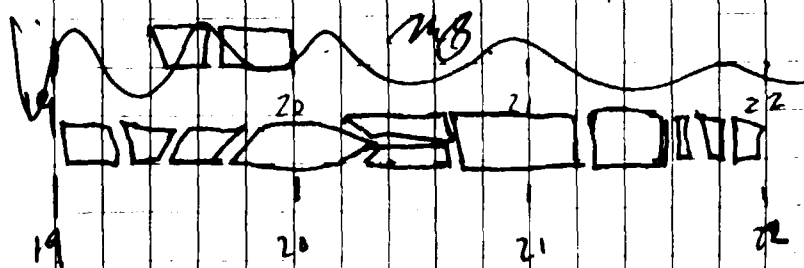
Run #4 retrieved 15-11 ft.
see table on p. 15
mostly broken pieces
largest pieces



same description as previous run
re - no definitive evidence
of water bearing fracture.
Note - all fractures will
be 'reviewed' by Ruben
Ponciano of G&M at
conclusion of coring
during better light conditions.

0100

Run #5 (19-22 ft)



Mark Gneary

② Mark Gueary 8/6/92

Run 6 (22-25)

all broken pieces

Run 7 (25-27)

0200

1 piece 0.4 ft at top
then broken pieces
some pieces w/ large
calcite deposits.
now having problems
getting core catcher
to come up w/ sample

0230

finished tripping out rods
in order to free sampler.
was stuck in rod.

0300 finished for the night

~~Mark Gueary~~
8/6/92

8/6/92 Mark Gueary ②

1200 On-site at B-90 location
MW-6D was completed as
shallow well w/out grouting
deeper section cored
to ~65 feet.

1300 Telephoned Sally Odland
to discuss ~~the~~ MW-6
shallow well construction.
She will discuss this matter
with people in the NY office
to determine if this well
will be O.K. as constructed.
Ruben Ponciano of 68th is
in charge of B-90 operations
today as Wanda Morales
will work ~~the~~ this
evening's night shift with the
CME-55 at the car wash
location, coring MW-10D.

1330

B-90 now drilling
what will be the deep well
at MW-6 location (a few
feet from previously cored
MW-6D - which was completed

② 8/6/92 Mark Greany.

at shallow well.

MW-6D (new) is being drilled w/ B-90 down-the-hole hammer. Hammer is now at a depth of ~40 feet.

1400 - returning to condo for a break prior to this evening's coring activities w/ CM-55 at MW-10D car wash location.

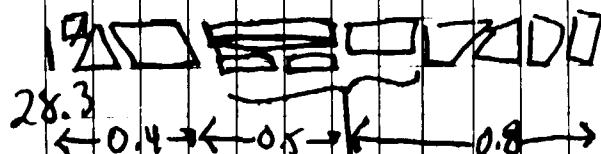
1830 (630 PM) return to G&U field office. Preparing to mobilize CM-55 to car wash location for tonight's coring activities at MW-10D.

1930 Setting up rig and recirculation system. drilling begins at 27 feet beginning drilling with a new drill bit tonight. Water level measured at 19.7 ft b.s.

Mark Greany 8/6/92 ③

2030 Begin coring run 7848
see table p.15
recovered broken pieces (small) followed by 0.6' piece and by larger broken pieces to 28.3'.
small broken pieces at top are eroded by drilling.
larger broken pieces at bottom are broken & fairly at various angles - no full diameter pieces.

Run 7C 28.3 - 30.0



area w/ thick
calcite deposits
covers center



calcite deposits
~ 1/4 inch thick

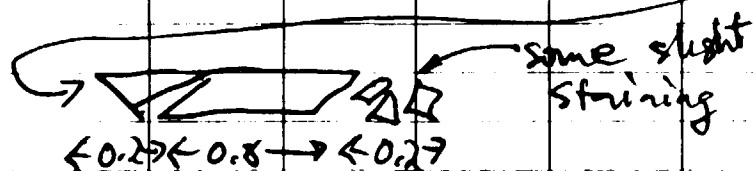
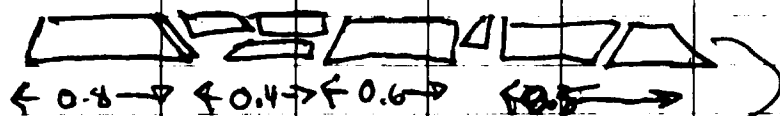
Mark Greany 8/6/92

②④ Mark Greany 8/6/92

Run #8 (30-33.5)

mostly large ~ medium pieces
with what appears to be
drillers breaks.

large pieces 0.6-0.8

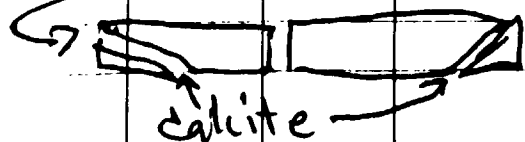
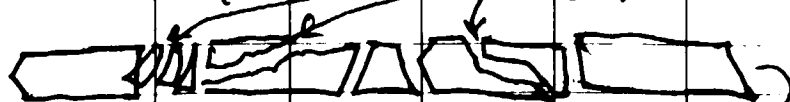


Run #8A (33.5-35.0)



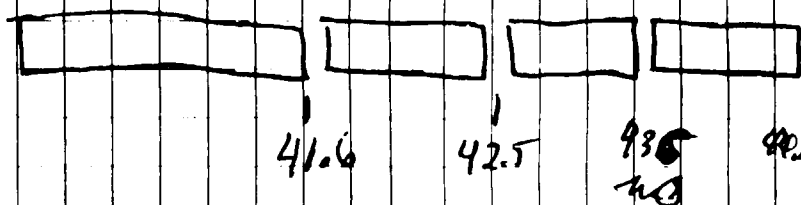
some slight staining

Run #9 (35-40)



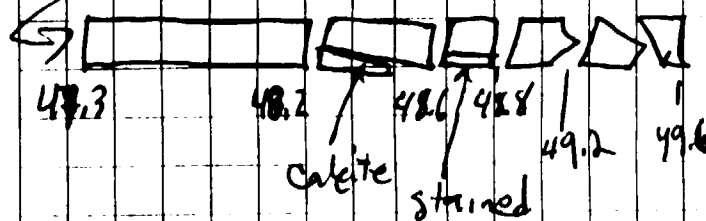
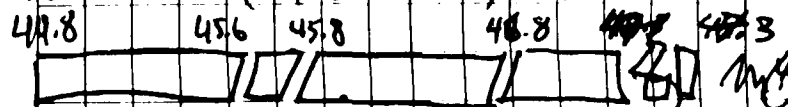
Mark Greany 8/7/92 ②⑤

Run #10 (40-44.8)



4 very competent pieces
with 'tight' breaks
slight staining on faces
of 'tight' breaks.

Run #11 (44.8-49.6) rec. 4.8



Now USING TIME FOR 8/7/92

0/15 Run 12 is retrieved
see table to the right
on page 15 for detailing info.

Mark Greany

(26) Mark Gueary 8/7/92

0115 run #12 49.6 - 50.4 ft

~~6 ft 49.6 - 50.4~~
Wanda Morales notes this
interval at 49.4 - 51.4

~~0130 drilling core run #13 MB~~

Run #12 cont.

recovery = 1.68 ft 200 psi
21 minutes

Run #12A (51.4 - 55.0)

recovery = 3.6 ft (100%)
14 minutes

Run #13 (55.0 - 59.8)

recovery = 4.8 ft (100%)
22 minutes

Run #14 (59.8 - 64.7)

recovery 4.9 ft (100%)
14 minutes

Mark Gueary

Mark Gueary 8/7/92 (27)

Run #14A (64.7 - 65.5)

0.8 feet recovery (100%)
3 minutes

Run #15 (65.5 - 70.0)

4.5 feet recovery (100%)
12 minutes

Run #16 (70.0 - 75.0)

recovery = 4.55 feet (91%)
11 minutes @ 300 psi

note: measurements for
run #15 and #16 were
obtained 8/7/92 at 0900.
MB left site at 0230
at run #15 began.

Core was going very
satisfactorily at this time.
excellent recovery and
excellent rate of penetration.

Mark Gueary

②⑧ Mark Greany 8/7/92

0900

back on-site to complete
notes for last night's
drilling activities.
drilling completed at 75.0 ft.
at 0315 AM.
demonstration took
approximately 1 hr 15 min.

All cores are being
archived in site storage
space. Descriptions will
be made in more
detail later.

~~6-10-92~~ 6/10/92

1130

At boring B-13
Adjacent to and south
of O'Henry Dry Cleaners.
driving split spoon #1

Spoon #1 (0-2 feet)

10-12-21-14 blow counts
140 lb hammer 30" drop
HNU background = 0.2 (GTH HNU)
HNU background = 1.0 (FAC HNU)
spoon driven 2 feet

Mark Greany 8/10/92

②⑨

three inch diameter spoon
recovery = 1.1 feet
clayey silt, little gravel
trace rock fragments
organic materials roots
HNU reading on closed spoon
temporarily deflected to ~5 ppm
also temporary HNU reading
of ~4.5 ppm in borehole.
Both above readings drop
to background after ~5-10
minutes.

Weather this morning:

Clear hot 80-90°F

Wind, variable, light 0-10 mph

Spoon #2 (2-4 feet)

recovery = 1.3 feet

10-25-17-12 blow count

1st 1/2 foot is same as

above, the rest is

highly "altered" rock.

Rock capable of being
broken by hand.

loose cemented medium grain
Ruben Porciano terms it "altered"

Mark Greany

③① Mark Greany 8/10/92

B-13 cont.

Spoon #3 (4-6 ft)

recovery 1. # mb recovery ft

7-11-11-19 blow count

mostly silty material

no H₂N readings above background

sample will be taken

from this interval.

Spoon #4 (6-8 feet)

spoon advances only 5 inches

after 50 blows

~ 4 inches of material recovered

no H₂N readings above background

G & M sample taken from

spoon #3 (4-6 feet)

sample B-13.

portable G-C sample taken

from spoon #2.

12/5 driller breaking for lunch

NOTE: Chronology change to

6/10/92 on page 28.

Usually new day is started

on top of page. However

this morning has been

Mark Greany 6/10/92

Mark Greany 8/10/92 ③①

a little hectic and I began
taking notes before I realized
that I should have started
a new page.

MORE information regarding
prior activities.

On Friday afternoon (8/7/92)

casing was set to ~45 feet

at MW-6D. This casing

was allowed to set over

the weekend. Today

Tonito informed me that

Jack Dema's oversight

personnel were here

on Thursday and observed

drilling activities at MW-6D.

They video-taped activities

including an event where

down-hole pressure caused

drilling fluids to issue

out of hole onto surface.

Mark Greany 6/10/92

(32) Mark Gueary 8/10/92

1300 Jack Dema's oversight personnel were on-sight again today (also were on Thursday, see p. 31).

I introduced myself to Richard Smith of Jack Dema's office.

773-6142

He is accompanied by a man and a woman that he says are environmental experts hired by Dema. They are recording notes on tape and are taking photos in the area. Richard Smith says he is not concerned today with ~~any~~ GTR drilling activities, but is here to familiarize the experts with the study area. Richard Smith refuses to give me the names of the others. I offer to answer any questions he may have.

Mark Gueary 6/10/92

Mark Gueary 8/10/92 (33)

Other business today included preparation for sampling. However - no split samples will be taken today. Samples (2) will be collected tomorrow from desired locations. Much preparation taken care of today early in the morning. Faxed time sheet to home office & spoke w/ Susan Schofield. Informed Susan that Dema personnel were on-sight.

Ruben of drilling crew (soil tech) cut finger this morning at ~1100. taken m/b. He has been taken to hospital for possible stitches (sp?). This injury occurred at MW-6D location while tripping out rods after completing air hammering at a depth of 64.1 feet.

③④ Mark Greany 8/10/92

MW-6D is now complete. The original MW-6D is going to be taken out and grouted up. GFM was very cooperative in agreeing that the construction of a shallow well in the original MW-6D location was a mistake since the bottom section was not properly grouted closed.

1350

at MW-6D location Wanda Morales is preparing to do geophysics at this location. First interval of 0-45 feet was measured w/ geo-physical instruments prior to setting the six inch stainless steel casing. Below the casing will remain 'open hole'. First interval 0-45' was measured w/ geophysical

Mark Greany 8/10/92

③⑤

instruments 6/7/92 Thursday in the afternoon.

At Texaco station
CONE-55 equipment used to perform boring B-13 is being decontaminated. GFM approved decontamination process is being followed. (see page 6 of logbook one).

1400

At GFM field office
Smith Bay

Dan Bingham is performing portable GC analysis on samples taken from B-13.

~~A hit in B~~

Hits of PCE measured:

0-2 interval	36 ppb	PCE
2-4 interval	26 ppb	PCE
4-6 interval	344 ppb	PCE

Clinton not in office
out for lunch
returning to CMR-55

Mark Greany

(36) Mark Greany 8/10/92

1430 Decon of CME-15 equipment completed. Now mobilizing to boring location B-10

1500 (B-10)

split spoon #1 is retrieved.

slow count 17-16-10-8

recovery 1.3 feet

No HNU readings above background
background = 0.1 ppm

split spoon #2 (2-4 ft)

slow count 7-16-22-16

recovery = 1.2 feet

no HNU reading above background
background = 0.1 ppm

silty clay, w/ rock/gravel fragments

split spoon #3 (4-6 ft)

slow count 8-12-12-12

recovery = 1.4 feet

more silty clay
w/ rock fragments/gravel

No HNU reading above background
background = 0.1 ppm

Mark Greany

Mark Greany

8/10/92

(37)

(B-10) Continued

split spoon #4 (6-8 ft)

slow count

25-38-50-50/4"

spoon refusal

Water encountered here

This is first time

water encountered while

split spoon sampling

according to Ruben Arellano.

Sample for analysis

will be taken from

this interval.

This (and all previous) bore hole
to be closed by filling
with grout.

1530

going to MW-6D location

Wanda Morales of G&M is

now conducting geophysical

survey of the section

from bottom of casing

to bottom of hole

(~ 45 to 65 feet)

Mark Greany

(38) Mark Greany 8/10/92

1530 cont.

Ruben of drilling crew (soil tech)
has returned from hospital
received 6 stitches in left hand
on pinky finger (2 cuts).
Wanda has completed
caliper measurement of
MW-6D. Wanda Morales
of GDM is now preparing
to do sonic instrument
geophysical logging at MW-6D.

1600

At decon-area
B-90 is being decontaminated
in preparation to perform
reaming at MW-10D.
Reaming of MW-10D to
be performed at night
(car wash location access
restricted to night hours).
Now also decontaminating
equipment from cone-ss
to prepare for next
next boring location
(either B-11 or B-12).

Mark Greany

Mark Greany 8/10/92 (39)

1730

At location B-11
Completed augering through
concrete at rear of
O. Henry Dry Cleaners
in a parking area.
Concrete is ~ 0.6 ft deep
Split Spoon #1
recovery = 1.3 feet
Blow count 8, 10, 10, 15
H/Nu deflected off scale 0-20 ppm
when probe inserted into
top of unopened spoon.
H/Nu also pegged on 0-20 ppm
when probe inserted into
bore hole.
H/Nu reading of 50 ppm when
scale set 0-200 ppm and
probe inserted into bore hole.
H/Nu reading of 5-10 ppm
observed in soil sample
upon opening spoon.
Sample will be taken
from this spoon.

Mark Greany

(40) Mark Greany 8/10/92

Split spoon #2
recovery =

Blow count

20 - 19 - 50 - 50

spoon refusal at 3.5 feet
auger refusal at 3.8 feet

1800

Ruben Ponciano of G&M
preparing sample for
analysis.

samples also collected from
each spoon for portable GC
analysis at G&M field office.

1900

grouting up B-11

demobilizing CME-55 to
return to decon area.

Activities complete for the day.

B-90 is scheduled to install
upper casing at MW-10D
tonight. Work to begin at 1930.

~~Mark Greany~~
Mark Greany 8/10/92

Mark Greany 8/11/92 (40)

8/11/92
0700

On-site at Texaco

Weather - hot clear light breeze

Monitoring instrument: HNu

(see page 3 for information on HNu)

0830

At Texaco of Clinton Moffet

& Ruben Ponciano of G&M.

CME-55 is down - we are
awaiting a part for replacement.

0930

Repair/maintenance of CME-55
complete, now preparing
to mobilize to B-12
at O'Henry Dry Cleaners
(parking lot in rear).

1000 B-12

Augered through 0.6 ft concrete
Split spoon #1 (0-2 feet)

Blow count = 2, 4, 3, 3

recovery = 1.2 feet

HNu = 1 ppm background = 0.1 ppm

silty clay, silt on top 0.4 ft

Mark Greany

(42)

Mark Greaney 8-11-92

1015

split spoon #2 (12-14 feet) (B-12)

blow count = 5, 3, 4, 6

recovery = 1.4 feet

Spoon is moist - but probably due to nearby steam/discharge lines from O. Henry and not from presence of gw

1030

split spoon #3 (4-6 feet)

blow count = 5, 13, 36, 31

recovery = 1.6 feet

H/Nu reading of 0.1 (background)

H/Nu reading of 1.4 in spoon #2 (2-4 feet)

1045 auger refusal at 16 feet MB

split spoon #4 (6-8 feet)

blow count 28, 24, 16, 28

H/Nu reading of 2.2, 6Kgrnd = 0.1 ppm (ppm)

recovery = 1.8 feet

Sample will be taken from this interval B-12: 6-8 feet

split spoon #5 (8-8 ft 5 inches)

Spoon refusal

50 blows to advance 5 inches
auger refusal at 8 feet 5 inches

Mark Greaney

Mark Greaney 8/11/92

(43)

Split sample collected from B-12
Sample collected from 6-8 ft
interval (split spoon #4)

Sample B-12 (6-8 ft depth)

(1100)

VOCs

BHR61 MB

BHR61

MBTE + 2*

7382B-01-61

TPH

7382B-02-61

metals

MBES 61 MB

MBES 71

CN

MBES 61 MB

MBES 71

BNAs

BHR61

*(+2) n-propylbenzene

1,2-dibromoethane

Sample taken from 6-8 ft interval

Sample packaged on ice

in coolers for later

shipment to labs.

Breaking for lunch

1300 decontaminating CM9-SS

for decontamination

at decon-area (Texaco Station)

Mark Greaney

(44) Mark Greany 8/11/92

1400

collecting field blank sample
pouring de-ionized water
over sampling equipment
(decontaminated according
to procedure on p. - log book #1.

sample: field blank sp#

VOCs	BHR60
MBES +2	7382B-01-60
TPH	7382B-02-60
metals	MBES 70
cu	MBES 70
BNA's	BHR60

1500

re-mobilizing CME-55 to
location for boring B-8.
Rig cannot be properly
positioned. Several attempts
made to back up a steep
section of driveway. Narrow
passage between an above
ground pump house and a
Mark Greany

Mark Greany 8/11/92

(45)

nearby building - restricts
access to desired location.
Abandoning attempt to perform
this boring. New positioning
rig to perform boring
through overburden as part
of the installation of
monitoring well MW-5.
MW-5 is also located
on the Fillet garden
property. A ~~split~~ MB
split sample will be
taken from this location.

MW-5

split spoon #1 (0-2 feet)

blow count 13, 19, 18, 21

recovery 1.1 feet

HNA reading = 0.1 ppm = background

silty, grey material

split spoon #2 (2-4 feet)

blow count 25 30 34 29

recovery = 1.4 feet

HNA reading of 2.0 ppm Bkgrnd = 0.1 ppm

Mark Greany

(46) Mark Greany 8/4/92

split spoon #2 (cont.)

Silt and silty clay.

Split spoon #3 (4-6 feet)

blow count 35, 50/3 inches

spoon refusal

highly altered rock recovered
top of bedrock encountered.

Sample will be collected
from entire split spoon #2
and bottom of split spoon #1
to ensure sufficient volume.

VOCs	BHR 62
MBTE +2	7382B-01-62
TPH	7382B-02-62
metals	MBES 72
cu	MBES 72
BNAs	BHR 62

Soil samples packed in ice
(cooled to 4°C) no preservatives
Field blank also packed in ice
and preserved according
to Grossman (see next page)

Mark Greany

Mark Greany 8/4/92

(47)

Field blank

preservatives

VOCs HCl pH < 2

MBTE +2 HCl pH < 2

TPH H₂SO₄ pH < 2

metals HNO₃ pH < 2

cu NaOH pH > 12

BNAs none

1630 packing samples &
completing paperwork.
Will attempt to reach Fed Ex
before closing time 500.

1730

Fed Ex shipment will be
made tomorrow morning.
Transporting all sealed coolers
to Corado room at
crystal cave to maintain
proper custody.
Coolers will be taken to
Fed Ex at airport first
thing tomorrow morning.

Mark Greany

④⑧ Mark Greany 8/11/92

Shipping Info: air 6H
400-5269 →

VOCs/BNA	Comp Chem	-6501
MBTE	RECRA environ.	-6534
TPH	Gen. Phys. (GP) Env.	-6545
metals	US EPA ESD Edison	-6523
cu	Skinner & Sherman	-6512

samples to be shipped 8/12/92

2100 drilling activities are underway at MW-100.
Reaming w/ B-90 down-the-hole air hammer.

2130 Activities suspended due to air pressure under pavement causing pavement area of approximately 10-15 foot radius to lift up. Water is being forced up through various existing cracks/seams in the pavement. Operations are stopped. Hole will be grouted and B-90 will ream through grout tomorrow.
Mark Greany

Mark Greany 8/11/92 ④⑧

A neighbor complained of noise from air-hammer operation this evening.
By grouting hole it is expected that less air will escape through the side walls of the reamed hole in the overburden.
2200 leaving site for the day

~~Mark Greany 8/11/92~~

Mark Greany 8/11/92

⑤ Mark Gueary 8/12/92

0700 Bringing coolers out of
Condo to car for transport
to Fed Ex at Airport.

Coolers stored in condo overnight
to maintain proper custody.

0800 arrived at airport Fed ex
Fed ex office does not open
until 0900 AM. Waiting at loading dock.

0900 Coolers are brought into
Fed ex office.

1000 returning to site
additional paper work filled out
at Fed Ex office for customs
purposes. All coolers are
now in custody of Fed Ex
for shipment to Lab.

1030 At location for boring B-8.
The attempt to perform this
boring was abandoned yesterday
due to difficulty in access
with drill rig CME-55.
Location restricted - rig
could not be positioned
while in tow.

Mark Gueary

Mark Gueary 8/12/92 ⑤

This problem has been solved
by towing rig to position
close to desired location.
From this position the
rig winch is used to
pull the rig the remaining
distance (up a section of hill).
The tank truck Fed
is used as an anchor
for the winch at top
of the hill section. This
process is not easy but it
works and rig is finally
positioned at desired
location.

1130 now drilling boring B-8.
breaking through concrete driveway.
Rig must be repositioned
approximately one foot as
we have encountered a
pvc pipe below the concrete.
Pipe is not harmed. Purpose
and identity of pipe unknown.
No damage to pipe.

Mark Gueary

(52) Mark Greaney 8/12/92

1200 drilling begins at new location ~1 ft. away from previous attempt ~~where~~ ^{where} PVC pipe was encountered. This time a boulder is encountered under the concrete. The rig is again repositioned, immediately adjacent to present hole to avoid boulder



Boulder is successfully avoided. G&M collects a sample from this location.

concrete = ~0.8 ft.

split spoon #1

0.8 - 2.8 feet

recovery = 1.3 feet

H₂O = 0.1 = back ground

split spoon #2

2.8 ft - refusal at ~0.6

recovery = 0.8 feet

H₂O = back ground = 0.1 ppm

Sample is collected from

split spoon #1 B-8: 0.8 - 2.8

Mark Greaney

Mark Greaney 8/12/92 (53)

No split sample is taken from location B-8: 0.8 - 2.8
The only split samples taken during week of 8/3 - 8/7 and week of 8/10 - 8/14 are taken at B-12 (O'Hanry) and MW-5 (Tillet)

1400 Rig is demolished from B-8 location.

This took a long time due to method of positioning rig using winch. Tank truck Ford F-600 served as anchor for cable to winch to slowly ease rig down the decline section of driveway.

Now returning CMC-55 to decon area for decontamination.

1500 No more borings to be performed today.

Clinton is packaging samples for lab delivery via soil tech.

Mark Greaney

(54) Mark Gueary 8/12/92

G & M sampler are walked through curtains by soil tech personnel each day. Samples are then shipped to Lab via Fed ex from Puerto Rico. CME-SS activities complete for the day.

1930 on site at car wash MW-10D location.

Setting up B-90 to ram through grout placed down hole last night. Grout was placed to prevent air from escaping through side walls of the bore hole in the overburden. The air that has escaped has caused a problem by exerting an uplift force on the pavement in an area of approximately 15 foot radius around the bore hole. Water was forced up through existing cracks and seams

Mark Gueary

Mark Gueary 8/12/92 (55)

in the asphalt. 2030 Air hammering is underway. After hammering down ~15 feet the pressure again has built up enough to force water/air up through existing cracks/seams in the pavement. Operations are halted for the moment to prevent the build up of further pressure, which may rupture the pavement.

2100 CME-SS is brought in to use hammer/winch to drive a spear-tip through pavement in various locations to serve as pressure release vents. "Spear-tip" creates holes in pavement of ~4 inch diam. Several holes are punched into pavement in the affected area. These holes will be filled with grout after drilling is complete.

Mark Gueary

(56) Mark Greany 8/12/92

2130 Air hammering starts up again after installation of several punch-holes in the area affected by the build up of subsurface air pressure. The punch holes are effectively venting pressure as water can be seen bubbling / splashing as air pressure is relieved.

Part of the problem may be the vent hose at the top of casing that is used to conduct cuttings to drums for containment. This system is used here to minimize the mess created by cuttings that would otherwise issue directly out of the top of the casing. GJM is attempting to minimize the impact in this area so as not to upset the owner of the car wash business.

Mark Greany

Mark Greany 8/12/92 (57)

2200 Air hammering is progressing slowly due to difficulty in keeping the cuttings moving through hose containment systems. Now down to a depth of approximately ~~30~~ feet. Operation is slow but seems to be progressing in a stabilized manner. Air pressure build up problem is apparently under control.

~~Re 2130~~
2245 returning to condo.

~~Mark Greany
8/12/92~~

Mark Greany

(58) Mark Greany 8/13/92

0730 On site at Texaco
preparing to mobilize CME-55
to MW-2 location to
do boring in overburden.

MW-2 located in North end
of V-wind plaza parking area.

Weather: hot 85-90 light breeze
intermittent showers this AM
very humid today

0930

CME-55 in position in northern
end of parking lot and
now boring through overburden
at location of MW-2 MB (MW-2)

Augering through asphalt.

Asphalt 0.4 ft thick

split spoon #1

0.4 - 2.4

H.Nu Background = 0.4 ppm

recovery = 1.5 feet, H.Nu = 0.6 ppm

10, 19, 28, 15 blow count

0.4 - 1.2 clayey silt rock fragments
trace sand

1.2 - 1.9 = silty clay

Mark Greany

Mark Greany 8/13/92

(59)

MW-2^{MB} boring in overburden cont.
split spoon #2

2.4 - 3.1 feet

0.5 ft recovery

40 blows, then 50 to

advance only one inch

spoon refusal, auger refusal ~ 3.4 ft

H.Nu = background = 0.4 ppm

Sample will be taken from
split spoon #1

Now demobilizing CME-55 to

prepare for boring behind

Gassett dealership to be

called B-5^{MB} this boring

being performed now after

delays in obtaining access

agreements.

Mobilizing to B-5^{MB} (B-5)

boring to be located in back

of Gassett bldg near the

car repair bay in the rear.

Augering through asphalt.

asphalt = 0.35 feet

Now hammering first spoon

Mark Greany

⑥ Mark Greany 8/13/92

Boring B-5 cont.
split spoon #1 (0.35 - 2.35 feet)

Blow count = 5/8/12/14
H₂O reading of 5.0 ppm
Back ground = 0.4 ppm
recovery = 0. m3 1.6 feet

split spoon #2 (2.35 ft - 2.8 ft)

Blow count = 50 blows to advance 0.4 ft
0.4 ft recovery
H₂O deflected slightly negative
most likely due to high humidity.

B-5 sample taken from 1st spoon

CME-SS equipment is now
demobilized and taken to
Decontamination area.

Sample is preserved (ice) and
packed for shipment to Enseco.
No split sample taken at B-5

Mark Greany

Mark Greany 8/13/92 ⑥

1600 No further boring/sampling
activities planned for today.
Returning to Condo to fresh
before B-20 drilling activities
begin at Car wash (MW-10D)
this evening.

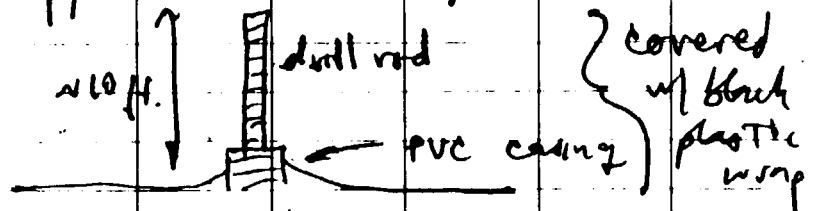
2030 On site at Car wash
location. B-20 is mobilized
and preparing to ream MW-10D

2145
B-20 is out of service due
to the failure of a hydraulic
connection. Minor amount of
hydraulic fluid escaped and
was immediately cleaned up.
No fluid reached the
opening of the bore hole.
Drill rod is stuck in hole
as a result of breakdown.
Rod and hole will be
covered with plastic until
B-20 can be repaired.
No drilling is scheduled for

Mark Greany

⑥2 Mark Greaney 6/13/92

Friday (tomorrow) night, this
drill rod will be left in
this configuration for the
weekend. Drilling (reaming)
interrupted at a depth of
approximately 40 feet.



Done for the night

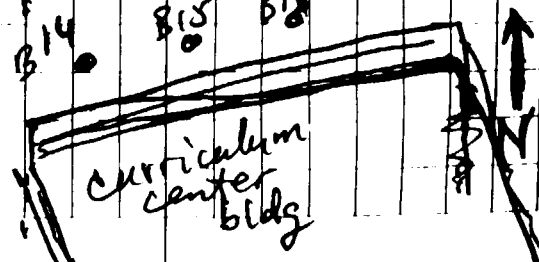
~~Mark Greaney
6/13/92~~

Mark Greaney 6/13/92

Mark Greaney 6/14/92

⑥3

0730 On site at Texas
w/ Ruben Ponciano of 6th M
& Soil Tech CME-55 crew
(Juan, Jorge and Mile)
Preparing to take additional
borings B-14, 15, 16 north
of the curriculum center.
These borings are not part
of the original plan for the
site. However EPA has
been informed that these
borings will be performed,
EPA is satisfied that
these borings are appropriate
and that they will yield
valuable information regarding
potential contamination in
the area of the curriculum
center. (according to S. Odland
from telephone conversation.)
locations: B-14 B-15 B-16



Mark Greaney

⑥4 Mark Greany 6/14/92

0800 weather today is
hot, humid $\sim 90^\circ\text{F}$
light variable breeze.

preparing to perform boring B-14
(split spoon #1)

blow count 5/5/6/6

spoon driven from surface into
dirt area scheduled to be
covered with a concrete pad
by curriculum center.

recovery 1.2 feet

HNA = background = 0.2 ppm

split spoon #2

blow count 6/40/50 - to advance 2 inches
spoon refusal ~ 3.6 feet

recovery = 1.0 feet

G&M sample taken from 1st spoon

⑥5 B-15 ~ 20 feet east of B-14

split spoon #1

blow count 5/5/6/6 mb

: 6/4/4/5

recovery = 1.3 feet

HNA = background mb = 0.2 ppm

split spoon #2

blow count: 50 to advance 2 inches

Mark Greany

Mark Greany 6/14/92

⑥5

B-15 cont. $\rightarrow$ split spoon #2 cont.

recovery = 0.2 feet

HNA = background = 0.2 ppm

G&M sample will be taken
from split spoon #1.

No split sample taken.

⑥6 B-16 ~ 20 feet east of B-15

split spoon #1

blow count 10/10/10/10

recovery = 1.2 feet

HNA = background = 0.2 ppm

split spoon #2

blow count = 12/14/45/50 to
advance 3.5 inches.

spoon refusal at ~ 3.6 feet.

HNA = background = 0.2 ppm

recovery = 1.4 feet.

G&M sample taken from 1st

split spoon.

Summary of B-14, 15, 16

all 3 - performed in same general area
beginning boring in dirt surface.

all 3 - sample taken from 1st spoon.

all 3 - no HNA reading above background.

Mark Greany

(66) Mark Gueany 8/14/92

1430 CMZ-55 and split spoon
equipment has been decontam-
inated. Drill crew returning
to Puerto Rico for weekend.
Tonito of Soil Tech is bringing
GFM samples to Puerto Rico
for shipment to Eneco lab
via Federal Express (samples
are taken by GFM & Soil Tech
through USVI customs).
Done for day

~~Mark Gueany
8/14/92~~

Mark Gueany 8/14/92

Mark Gueany 8/17/92 MONDAY (67)

0800

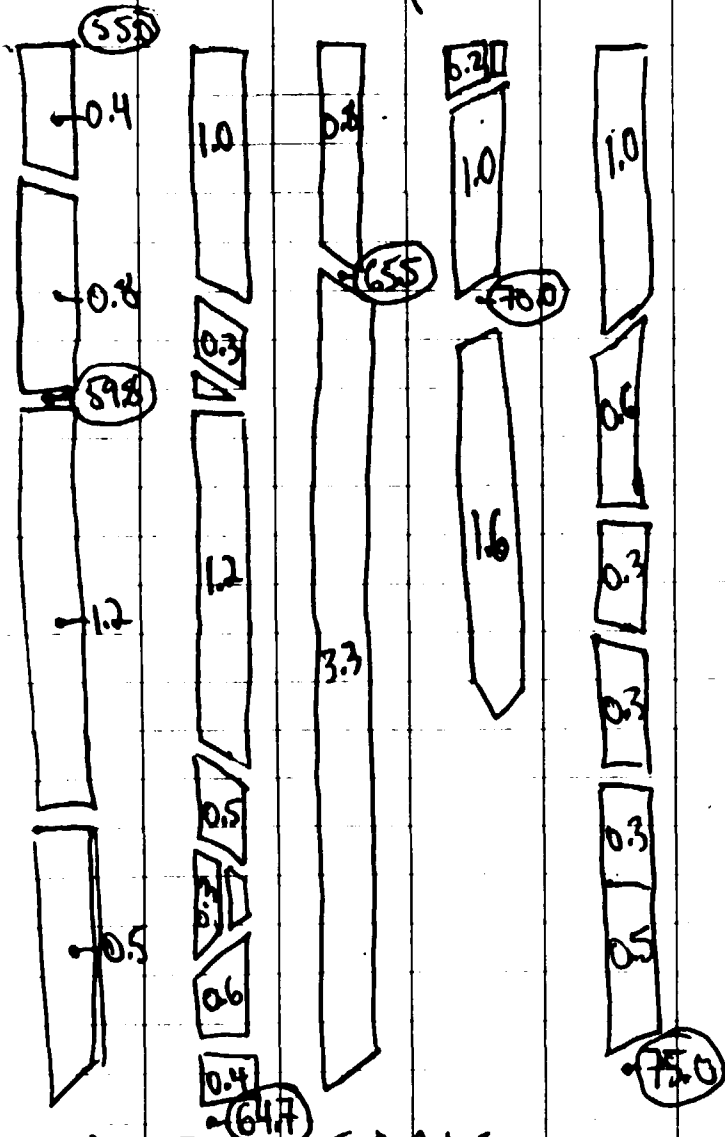
Weather hot, humid, variable breeze
On site at storage facility
near Esso Station.
Ruben Ponciano of GFM is
going to organize core boxes.
I will use this opportunity
to inspect the cores taken
from 55.0 to 75.0 ft at
monitoring well # MW-10D.

Other activities today will
include the collection of
drummed cuttings from various
locations for consolidation
at the Soil Tech - Kessler
House. This house is located
in the lower John Donko area
of St. Thomas, on the west side
of Charlotte Amalie.

Drum consolidation meaning drums
to be staged together. Contents
will not be mixed, as currently
identified according to drilling
locations.

Mark Gueany

⑥8 Mark Greany 8/17/92
MW-10D Cores from 55.0 - 75.0



NOT TO SCALE
Mark Greany

Mark Greany 8/17/92 ⑥9

MW 10D

major fractures at -

49.6 to 50.7 feet
and
53.4 to 54.7

Water at 19.7 feet.

NOTE above intervals subject
to interpretation. Other zones of
fractures noted at
25.0 - 27.3
37, 38, 39 ft (slightly altered
fracture zone)
70.0 fracture.

1200

CME-55 crew is continuing
to restage drums at
the Soil Tech Kessler House.
(see p. 67) - Drums will be
stored at Kessler House until
ultimate disposal is decided
on the basis of sample analysis.

Mark Greany

(70) Mark Greany 8/17/92

1600 B-90 crew will be working
at MW10D location (car wash)
this evening. No further
activity to report today.

2100 MW-10D

B-90 is up and reworking
to a depth of 55 ft. to
prepare to set casing.

2200 leaving site to prepare
for possible sampling
activities tomorrow.

~~Mark Greany
8/17/92~~

Mark Greany 8/17/92

Mark Greany 8/18/92

(71)

8/18/92

0800 Weather: Hot Humid ~90°F
variable breeze

At G&M field office w/
Clinton Moffatt.

Sampling will not be performed
today as sampling protocol has
not been approved. LMS
submitted & approved.

Phoned Sally Ballard at NYC
CDM FPC office to inform
her that sampling has been
postponed. She will push
to have sampling protocol
submitted and approved so
that surface soil samples
will be collected this week.
CDM FPC is scheduled to
sp/17 samples from 100% of
the locations that G&M
will sample.

1200

CME-15 crew continues to
move drums of cuttings to
Soil Tech Kessler House.

(72) Mark Greany 8/18/92

No drilling activities to be performed by CM2-55 crew today. B-20 drilling will resume tonight at MW-10D (Car Wash).

1400 Activities conclude until B-20 can be mobilized to MW-10D location this evening to perform night drilling.

1930 On site at MW-10D

~~B-20 crew is installing casing in MW-10D to a depth of 55 feet. Casing will be allowed to set overnight and during the day tomorrow prior to air-hammer reaming the 'open-hole' section from 55 to 75 feet.~~

2200 Casing is set in MW-10D to depth of 55'. Done for Day
Mark Greany 8/18/92

Mark Greany 8/19/92 (73)

0800 Weather Hot Humid ~90°F
variable breeze

Surface Soil Samples will be collected by GPM today.

CDM APC will perform 100% split sampling.

Two background samples will be taken for metals ~~and~~ and cyanide only.

Samples will be collected by Rusten Ponciano and Clinton Moffat of GPM.

Split Samples will be accepted at all sample locations.

Samples are collected by clearing organic matter as necessary. VOA vials are filled with soil prior

to ~~soil~~ homogenization. Remaining soil collected is then homogenized prior to filling jars for BNA, metals, and cyanide analysis.

A field blank will also be collected after decon.

Mark Greany

74 Mark Gueary 8/19/92

SAMPLING INFORMATION:

Location	adm #s	MB	Org.	thorg.	Time	G/M #
N.E. corner curriculum ctr (SS-1)	MB	MB	MB	MB	0930	SS-1
N.E. corner curric. ctr. (SS-2)	MB	MB	MB	MB	0945	SS-2
NW corner of curric. ctr. (SS-3)	MB	MB	MB	MB	1030	SS-3
drum area (SS-3)	MB	MB	MB	MB	1030	SS-3
drum area (2 ft from SS-3)	MB	MB	MB	MB	1030	SS-3
near B-1 (SS-4)	MB	MB	MB	MB	1030	SS-4
O'Henry near B-13 (SS-5)	MB	MB	MB	MB	1130	SS-5
T. Let Garden area (SS-6)	MB	MB	MB	MB	1200	SS-6
Field Blank (FB-8-19)	MB	MB	MB	MB	1330	SS-7
NIHA area north of Hwy (SS-8)	MB	MB	MB	MB	1345	SS-8

Mark Gueary

75

Case # 18648

lab - organic - Compchem
inorganic - Skinner & Demer
After each 2 samples we returned to decon area to decontaminate sampling equipment. (We had 2 sets of sampling equipment, stainless steel bowls and stainless steel trowels). Standard 8-step decontamination procedure was used.

- 1) Soap & water scrub
- 2) tap water rinse
- 3) 100% nitric acid
- 4) tap water rinse
- 5) methanol
- 6) hexane
- 7) deionized water
- 8) Air dry / wrap w/ alum foil

1500 prepping samples & prepping paper work

Mark Gueary

(76) Mark Greaney 8/19/92

Samples are shipped at
Fed Ex at Airport.
INORGS - Shinnert Sherman
AIRBILL # 400-5269-6490
ORGS - CompuChem
AIRBILL # 400-5269-6556
Sampling complete.
1700 returning to Condo

2000

At MW-10D location.
B-70 is air hammering
open-hole section below
set casing. Set casing
to depth of 55' (last night)
Open hole section will be
reamed to depth of 75'.

2200

air reaming is progressing
smoothly. Reaming of
MW-10D should be
completed tonight.

Done for day

~~Mark Greaney~~
8/19/92

Mark Greaney 8/19/92

Mark Greaney 8/20/92 (77)

0800

On site at Texaco
CME-55 crew is here
preparing to decontaminate
B-70 drill rig prior to
remobilization from MW-10D
(completed last night) and
commencement of drilling
of MW-10 (cathelon) to
be performed tonight.

~~Notes~~ regarding yesterday's
sampling activities.

VIMA location was added to
locations to be sampled
during the day yesterday.
This location was sampled
as a background sample
only. Metals/cn analysis only.

1000 CME-55 crew is
preparing to level off the
'flush mount' at MW-4D.
The existing concrete
'mound' will be reduced
and made more flush w/grade

Mark Greaney

(78) Mark Gueary 8/20/92

Performing an 'inventory' of wells taking
w/ Clinton Mofet & Ruben Bonciano.

Well #	screen / open hole	sounded	depth to H ₂ O
MW-4D	51.0-71.0	71.4	12.42
MW-4	7.0-27.0	27.0	11.48
MW-3	10.4-20.4	30.40	17.30
MW-1	23.6-43.6	43.07	30.04
MW-1D	70.0-90.0	89.60	73.00
MW-14	25.2-45.2	45.39	27.92
MW-13D	99.0-119.0	119	54.22
MW-6D		63.40	7.90
MW-6	to be decommissioned		8.20
MW-11D	54.3-74.3	74.5	16.85
MW-12D	60.5-80.5	80.64	25.78
MW-7	15.4-35.4	35.32	16.90
MW-8	5.5-25.5	25.57	17.48
MW-9	14-34	34.08	13.06

~~MW-10~~

These water level measurements
are made today prior to
well development.

1600

Completed above water level
measurements. Activities complete.

Mark Gueary 8/20/92

Mark Gueary 8/20/92

Note: ~~SMO faced~~ and
faced all yesterday's
sampling information
to SMO today.

B-90 scheduled to
begin drilling MW-10
tonight.

2000

on site at MW-10 location

Drilling has begun using

B-90 down the-hole hammer.

An intermediate depth/shallow depth

well is to be installed here

Drilling is progressing smoothly.

2100

Drilling continues w/ B-90 rig.

Done for Day

~~Mark Gueary
8/20/92~~

Mark Gueary 8/20/92

Mark Greaney 8/21/92

(80) Inventory of remaining
Supply materials for Sampling

5 large coolers

4 empty

1-1/2 full of vermiculite

Bottles

3 boxes of 6 80 O₃ ampers

1 open box 10 1 liter ampers

1 open box 6 1 liter polys

2 boxes 12 1 liter polys

1 full box 46ml 122 vials

1 open box 18 vial vials (1/10ml)

1 open box 8 803 JARS

Mark Greaney

Mark Greaney 8/21/92 (81)

Supply (cont.)

1 bag of heavy surgicals

1 box surgical gloves (opened)

N $\frac{1}{2}$ dozen tyvek suits

Chemicals

NaOH

HCl

HNO₃ } in medium cooler

H₂SO₄ }

H₂Nu isobutylene

calibration gas - 2 bottles

H₂Nu - see page 3

H₂Nu cal gas regulator

Mark Greaney

82 Mark Greany 8/24/92

PAPERWORK

good supply of trip/chains

* possibly need labels
* CLP # stickers

plenty of Fed Ex slips

1100

At G&M office w/ Clinton Moffet

B-90 completed MW-10

last night to a depth

w/ 35 feet.

Screened from 35 - 15 feet

NO drilling activities today

B-90 was decontaminated

this morning.

going to office to copy G&M book.

* then done for day

going to airport.

~~Mark Greany
8/24/92~~

Mark Greany 8/24/92

8/24/92

Bill Holden

83

0700 At G&M trailer - Clinton Moffet
Site Manager. One well, no two-
left to complete MW-2, MW-5;
will start well development - MW-4D
MW-4, MW-3, MW-1, MW-10, MW-11
Containerizing pumping/development water
beginning B-90 tomorrow. MW-6
will be decommissioned; it will be reinstalled.
Have to ream it out, grade it to the
surface, replace.

Wanda Morales. Ruben Ponce

1000
0800 Arrived at MW-5 site - Wanda
is working for some cars to be moved
in order to position the drill -

Ruben is across the street at the Texaco
station evidently preparing to begin
well development. Wanda has some
information on the geology of St. Thomas -
she believes it is mostly volcanic.

Clinton works generally in the office

1010
0900 Getting ready to position the rig
Have positioned the rig; getting
ready to raise the mast
They have already collected soil
samples at this location - then will

Bill Holden 8/24/92

(84)

Bill Holden

8/24/92

be boring down 40-45', then checking to see where the water level is at.

1100 Drilling started

1110 Having ~~some~~ problems getting started. drill is getting stuck on rocks.

1115 The hammer is 5' long; each rod is 15' long - drilling is beginning to proceed. Drilling is taking place slowly to keep the cuttings down.

1120 Then have placed a half drum over the hole to help catch the cuttings.

1130 Down about 15'; still proceeding slowly

1145 Drilled down to 20'; flushing hole out with water.

1150 Containerizing the cuttings

Wanda (GDM) states top of bedrock is 4.8'.

1200 Brecking for lunch. They usually break 30 mins.

1245 Arrived back from lunch - work had begun (drilling)

1400 Down at 45'; still no water. Wanda says they are going to let the hole sit about 1 hour, and then check.

1415 Now have hit water.

Bill Holden

8/24/92

Bill Holden

(85)

Drillers will pull rods from the hole

1430 Pulled first rod from hole.

1435 Drill bit removed from hole

1500 Water measured at 23.9'

1505 Borehole depth 44.9'

1600 Clinom (GDM) arrives at site.

1605 Water table is about 24'; they want to screen about 5' above the water table, which makes it 19-34' screen. They will benharize/grout up to 34'.

They will have to let it sit overnight before constructing well, as the sand

that they add to the bottom will spill. Also will not hold the casing.

GDM has not had this problem at other wells, as they had a fairly good idea of where the water table was.

1615 5' of grout;

1625 Soil Ex arrives with grout machine.

1630 Beginning to mix grout; bennie pipe is down hole.

1645 Adding grout to hole.

1650 Finished grouting; cleaning up.

Closing down - will start again tomorrow

Bill Holden

(86)

Bill Holden

8/25/92

0715 Arrived at MW-5 site - signed Tailgate H&S form - drillers and Clinton, Wanda (G&M) are on site at MW-5. Wanda is measuring the depth to the gravel. Gravel is at 40.75', groundwater is still at about 24'. Well development is continuing over at the Texaco station. Development finished at MW-4, MW-4D. Clinton said development proceeded at ~ 1.5 gpm - today they will begin development of MW-3.

0730 Torito (Soil Ex) says they will take about 1.5 hours to construct the well here - then they will move across the street to the Texaco station to decom - they set up on MW-2.

Preparing 20' of stainless steel pipe.

0740 Clinton has marked off the area in the parking lot across the street where MW-2 is to be drilled.

- Now adding riser pipe to the screen. 4" pipe. - (10') - now adding 10' more, for a total of 20'.

0745 Well is in place - beginning to add sand. 3 bags in so far

Bill Holden

8/25/92

Bill Holden

(87)

0800 Four - Five - Six - sand now at 29.8

0805 9 bags in. " bags - sand now at 17'

0810 - Adding bentonite - up to 15'

0820 - Lowering mast

0825 - Pulled rig off well; removed top riser; set to fit flush with surface - returned to MW-5, placed back in.

0830 Left to return to apartment to speak with Jeanne Litwin - wants me to ask Clinton whether or not they have submitted a plan to EPA discussing the decommissioning of MW-6. Also - need to find out when the well development phase will be over - if any other activities will be going on. Spoke with Jeanne at 9th 0920

0935 Returned to site - MW-5 has been grouted to the surface. They are letting the gravel settle and slightly under - then will add the sand box.

Weather today - Clear, warm (90s), humid.
1000 Wanda M. has returned to G&M trailer - decommissioning is proceeding across at the Texaco Station

Bill Holden

(88)

Bill Holden

8/25/92

Drillers still waiting on grant to settle. Decided to observe well development at MW-3. Torke helped me locate MW-3 but no one was there. Torke said they are probably still at the Esso station. 1015 Arrived at Esso - Clinton M. "hot", along with the second crew. They have spent the morning pumping the development water which they collected yesterday into the large holding tanks. A structure has been built around an open bay to house this treatment "plant". An air stripper occupies one corner of the structure. Treatment will only be done when tanks are filled. Spoke to Clinton about schedule - GDM only expects to get one well developed per day (per team?). They will definitely be busy this week and next. Clinton said a schedule outlining this had been submitted to Sally Odland (CDM Federal) - I explained Sally was at a seminar this week and Jenna Lihon probably hadn't found the schedule.

Bill Holden

8/25/92

Bill Holden

(89)

He will also be calling Jenna to discuss the submission of details on how MW-6 is to be abandoned. Said this had already been discussed verbally. Spoke of Plan A - pull the well out of the hole and graft. If this fails, Plan B - drill through the bottom of the casing and then graft. Plan C - ? It will mostly depend on what happens when they try to do it. Clinton does not think that they will get started developing MW-3 until the afternoon. 1100 At MW-5 - well box still not installed. Drill crew has started setting up over at MW-2. Raised mast and positioned rig and air compressor. 1115 Spoke to Reuben (GDM) - they will be breaking for lunch and beginning well development operations. At MW-2 - crew getting set up for drilling. 1120 Beginning to break through asphalt. 1200 Advanced 5-6' 1215 Breaking for lunch.

Bill Holden

(90)

Bill Holden

8/25/42

1300 Returned to site

Wanda says they have drilled down to 26'; are now removing the tools to check the water level

1315 Removed tools from hole.

Wanda reported that the hole has collapsed - no water found with probe - hole collapsed completely! Fill material?

WDM will try reaming the hole again. (MW-6 will have to cut off the casing 5' below grade).

When this crew finishes with the well - they will go back to Puerto Rico - a different group will continue well development.

1325 Beginning to ream hole.

1330 Down to ~26'; water coming out of hole

1345 Cased reaming, continuing withings

1350 Began pulling tools

1410 14.8' to water

1420 14.02' to water

1425 13.9' to water

1440 13.85'

1450 Wanda has measured the bottom of

Bill Holden

(91)

8/26/44

Bill Holden

The hole at 24'; spoke with Clinton about how to construct well; Clinton wants to wait another 30 mins. to see what happens.

1500 13.79'

1505 Clinton M. L. decided to drill the well down to 28' i.e. 4' deeper than it is now.

1510 Drillers are getting ready to put the tool back in the hole. Water at 13.78' Will ream to 28', 7-27' screen

1525 Beginning drilling.

Water is now getting out of the hole - several times

1600 Still advancing bit.

1605 Now pulling tool from hole.

Water at 15.6' Total depth 28'

1610 Unsticking 20' screen in hole

1620 Beginning to add sand.

1630 Drillers left to get more sand.

11:40 Dropping meat; drillers return with more sand.

1700 Sand Pack at 50'; now adding

benzonite 22.5 bags of sand.

Benzonite seal 5-3'

Bill Holden

(92)

Bill Holden

8/25/92

- 1705 Preparing to cut steel river pipe, cleaning up cuttings.
- 1710 Wanda measured water at 13.66'
- 1720 Grouting up hole, cleaning up site.
- 1730 Cementing in road block - watering down site to $\frac{1}{4}$ clean cuttings off parking lot.

Moving 55-gallon drums the cemented road box to protect overnight.

- 1740 13.62' from top of stainless steel road box - last water measurement by Wanda M.

1800 Site activities shut down for night

Bill Holden

8/26/92

Bill Holden

(93)

- 0730 Arrived at site - near MW-6 - no crew here yet, are probably decommissioning at Texaco station.
- 0740 Clinton M. and Wanda M. are picking up geophysical equipment over at the Texaco station. Crew is decommissioning.
- 0750 Toronto says his boss from Soil Tech will be arriving this morning with some special tools to help pull the casing from MW-6. There are decommissioning the drill rig now, but will not start until his boss gets here.
- 0755 Second crew finished developing MW-3 yesterday, and are discharging the purged water now at the Exxon station. Today they will move on to MW-1, MW-10.
- 0810 Shopped by GSM Field Office to make copies of 8 hour NGS training for Clinton.
- 0900 Attempted to call Jeanne Lihou again. In meeting.
- 0905 Working with Wanda M. over at MW-6. Weather today - hot, humid.
- 0910 B-40 Mobile drill has arrived at MW-6 area; casing mast

Bill Holden

(94)

Bill Holden

8/26/92

0920 Torito⁵⁴ Torito has arrived with the lead driller

0940 Drillers began removing cement around well head with hydraulic hammer. More people arrived from Soil Ex, but Torito's boss will probably not arrive until 1200 noon.

0950 Using cable to pull flush-mount road box from the ground - are cutting the box into pieces and removing piece by piece.

1005 Spoke with Sean Libwin about decommissioning of well - she wants to check it out with the EPA WAM - will call her back in about 20 mins.

Warden stated that when they were installing this well, there was a large cavity about 7' down - they had to put a lot of sand in the hole - during decommissioning they need to try to blow this sand back out - this may give them problems, since it is finer than rock.

1030 Seannise Libwin has not been able to get in contact with the EPA WAM - will call back at 1200

Bill Holden

8/26/92

Bill Holden

(95)

1032 Drillers have removed road box, are continuing to use a hammer to remove cement/grout at the top of the well.

1040 Spoke to Clinton about Sean's concerns - he will be around this afternoon - so we may get this cleared up then.

1100 Finished removing cement/grout seal at top of hole.

1120 Still working now for tool/person from Puerto Rico. Clinton arrived and took care of arranging for more clean-up materials, at other well sites which have been worked on.

1145 GDM preparing to attach clamp line structure to the top of the pipe-well - cable will be attached to this to pull.

* Tecnie Libwin (201) 653 5828

EPA Wam has approved procedure.

1200 Well successfully pulled from hole in first try.

They are now going to drill an enlarged hole at the surface so they can place a 12" PVC pipe down - so that the sludge will come up in one place; also, there is a cavity just below the

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surface, in which the air would probably expand, not bringing the cuttings to the surface.

1215 Almost finished drilling hole for 12" PVC.

1420 Have got to PVC pipe in.

1225 Broke for lunch - crew also breaking.

1305 Drillers are constructing a cap for the 12" PVC pipe, to connect to a hose leading to a funnel on the left side of the B-92, which will direct the cuttings to one spot.

1345 Getting ready to put the tool in the hole.

1410 Began attempting to blow out hole.

1420 Advancing the tool in the hole - so far very little has been blown out.

1430 Adding 2nd pipe on tool.

1445 Adding 3rd rod on string - so far only about "1 1/2 bars" sand back out of the hole. Drillers adding water down the hole now.

1450 Water cuttings beginning to come out.

1515 Drillers left to get more water - so far not much has come out.

1530 Return with water.

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1545 Clinton arrived - verified that nothing other than well development will take place after completion of the well.

1605 Pulling tool from hole - Timbo says they will be having to purge sand pack again with a bigger hammer.

1615 With the tool out of the hole, running water is now visible down at a depth of about 5'.

1648 Trying again with 10" hammer started up air.

1645 Pulled hammer from hole - was not much more successful in blowing cuttings from hole.

1650 This hole was cased to 65' - hammered to 35' - Wanda M. just measured to 15 5', i.e. there is still a lot of sand down there.

1700 Back at G&M office to discuss this situation with Clinton.

Well was set at 23.8' - put 30 bags of sand in hole - had many problems getting sand - known to have equilibria in hole. Now have gone to 40' with 5" - no cuttings used 10" - no cuttings -

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got stuck at 25' - all cuttings must be getting stuck in void. Saw C. at 10' & 15' wants to try to run the 5" bit to room to the bottom 165' insert frame pipe, and incorporate the bottom cuttings into the grout. W.M. is worried about not going the 10' bit to 35'. Saw Blake they should grout what they have drilled, then run the 5" bit to try to run down to 65'.

How to get frame down? Paul looks - pump with down frame - go push it down to 65' & try to flush it out. Frame was that it won't be down.

Clinton is going to call Steve Panching in New Jersey.

1732 Tom is having dinner the kids are telling describing how they were going to see the hole.

1800 interesting the kids are not want to go to the upper 15' of mine!

1830 Returned with Wanda Teniba to site - drillers have left - they will have to come back - left site for day

Bill Holden

8/27/92

Bill Holden

(99)

0700 Arrived at site no one here yet

Observed drillers working here last night at least until 2030 when driving by site

0715 Clinton M. arrives

0725 Toniba arrives - said drillers worked until 2100 last night. Said they added 33 bags of grout and cement - grout has now settled down about 1.5'.

0740 Drillers arrive. Hole has been grouted to the surface - six-inch steel guide pipe has been placed in grout

Weather today - hot, humid

Clinton thinks it may take most of today to room and grout this well - then the rig has to be moved and dewatered. So they may not get around to installing the replacement well until tomorrow.

No well development yesterday - Reuben got sick - he will be working with the well development crew today.

Toniba says the guide pipe is only about 4' long.

0750 Drillers placing 5" bit into hole

0800 Placing screen on to direct cuttings

0805 Beginning drilling

Bill Holden

(100)

Bill Holden

8/27/42

0815 Grout cuttings coming out fairly regularly.

0820 Adding 2nd rod to string (each rod

is 15') - string now 30'

0830 Preparing to add 3rd rod - Tomlin has

left to make a phone call

0835 Drillers are working on water.

0850 Water truck arrives

0905 Remod hole several times

0930 Some sand now coming out - still at 30'

0950 Have advanced to ~38', driller is reaming
very slowly.

1050 Adding 3rd rod to string - string now 45'

1100 Advancing very slowly

1130 Still advancing rod slowly and constantly
reaming hole. Hole advanced to about 45'

1145 Breeking for lunch

1230 Resume reaming hole to 45'

1250 Getting ready to add 4th rod - string
now 60'

1300 Reaming slowly - still at 45' (have not
advanced string yet)

1400 Down to about 50'; have called Jeanne
Libman twice at home now - no answer -
called New York - no messages -

1415 Driller has reported downhole hammer

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8/27/42

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(101)

has stopped working at about 53' - they are
going to pull it out and see what happened

1420 Having trouble pulling the string from
the hole. String is stuck at about 40'

1435 Removed top rod from man - still are
attached, 3rd rod to the

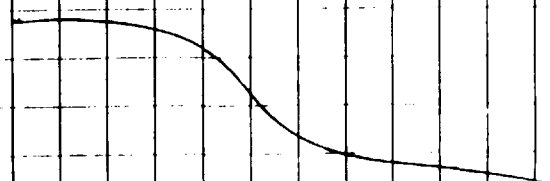
1440 By circulating water, the string has broken
free. Drillers are now reaming section where
hole got stuck.

1450 Tomlin has reported the hole has collapsed
in the lower 20' - water driller tried reaming
the hole, he hit rock at 33'. Tomlin
is calling it quits for today - he will bring
3" casing with him tomorrow and try
advancing casing as he drills.

1510 Tail removed from hole. Wells is
checking depths - 19' (4 more than yesterday)

1530 Crew is shutting down site for the
day.

Tomlin 775 7652 Left site for day -



Bill Holden

(102)

Bill Holden

8/28/92

0730 Arrived at MW-6 site - crew has just arrived and are setting up to work.

0745 Clinton told me Han has decided not to do any work here today - Han has been receiving complaints about some of the well sites (barrels, etc); are going to spend the day cleaning them up. There will also be developing MW-1D. There is a meeting today at 11:00. I have received 2 messages from New York - from Sally Odland and Pam Phillips.

0815 Spoke with Seane Lihum (NYC) - do not need to do inventory of supplies - do need to leave island as soon as MW-6 is over.

0900 Returned to site - no work going on at MW-1D yet. Most equipment has been moved from MW-6 over to the Texaco station.

0930 Went to Soil Ex office - Han had decided to have the meeting early - and are holding it now.

0940 Discussed what crew will be working next week on well development. Also discussed sampling what will be taking place in September.

Bill Holden

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1000 Discussed pumping tests.

1045 G.M. left for a visit of the field sites. I remained behind to fix my time sheets to Boston.

1130 Returned home

Bill Holden

(100)

Bill Holden

8/31/92

0900 Spoke to FPC in New York, got Sally's home phone number.

0920 Spoke with Sally - she wants me to get schedule from Clinton for 1) ground water sampling 2) pump test. Ground water sampling will be here place week of October 5-16th. 1st Pump test will not take place until November.

0940 Got some information from Clinton in office - drillers are on site getting rigs ready - Wanda: Tambo will be back today. Nothing will happen until about 1000-1030, according to Clinton.

1030 At MW-6, crews have moved out to MW-1 (?) to begin well development - still no one here.

1040 Tambo, Wanda, and drill crew arrive at MW-6 with smaller rig will not be using B-90, because it can not work with a 3" casing.

1100 Planning on driving casing to 65' then grouting as they pull the casing back up.

1115 Using 5', 10' sections of casing. Putting 15' in hole.

Adding 10' to string - total now 25'

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1120 Casing down 10' - getting ready to start driving it.

1130 Adding 10' section - total now 35'

1135 Removed 10' section added 5' - total now 20'

Spinning casing into hole using water.

1145 Spinning 5' Adding 5' - total now 25'

spin in. Adding 5' - total now 30'

Stopped to look for c. wand.

1200 Had to break a piece loose - now spinning 30' string in. Breaking for lunch 6 s' casing and 10' casing left to be added.

1215 Left site

1315 Returned, drillers and G&M not yet back.

1325 Drillers, G&M return with water truck. Tambo said they have 45' on the string. Advancing string.

Adding 5' of string (total now 50', according to Tambo.) Spinning in.

1345 Drillers are spinning (reaming) up and down - string advancing slowly - water hose broke. Wanda measure drill string at 46'

String length must be 50'.

Drillers are spinning hose.

1400 String seems to be stuck 140'

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1405 Casing is consistently getting too tight - takes much effort to break open.

1410 Removed 5' of casing - string now 45'

1430 Drillers are placing brine bit inside the casing and will try to flush out the hole.

1440 Trimming.

1500 Drillers reported that the brine will advance, but when they pull it up the casing will still not advance - they do not have a tool to advance both the brine and the casing at the same time. Tonito is checking with Puerto Rico to see if such a tool exists.

During this time drillers have left to get more water.

1520 Clinton said Tonito is still trying to get a hold of Corbana in Puerto Rico.

1530 Drillers are pulling brine from the hole.

1545 Corbana wants to go out from here - Clinton is going to check this out with Tom in NJ.

1600 Clinton tried to call down on the wellsite.

Tellie - is now driving down.

1610 Clinton said Tom wants to try putting a bentonite slurry down the hole.

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to try to keep the hole open while continuing to spin casing down.

1630 Wade says they will not be doing any more tonight. They are having problems getting water, and they need to go to the house back in town to get the parts to mix the bentonite/slurry.

Left site for Jan.

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Bill Holden

9.1.92

- 0700 Arrived at new site G&M (Clinton, Wanda) and Drillers arriving.
- 0720 Drillers have arrived with slurry pump / bucket. Also with Forklift loading cuttings on pallets to prepare for removals.
- 0740 Drillers flushing at hole - are getting large quantities of broken rock.
- 0800 Pulling triume from hole. Replaced triume, fixing broken hose.
- 0810 Advancing triume, hose broke again. Tunito thinks the hole is plugged somehow. Removed triume from hole - clearing out.
- 0815 Readvancing.
- 0830 Breaking down triume. Removed top 10'; replaced with a different section. Now advancing triume and getting good circulation.
- 0850 Continuing to flush, adding 5' to triume.
- 0900 According to Tunito, the triume is currently at 55'; they are not planning on advancing the casing, which is still at 45'; the slurry appears to be holding the hole open. They are going to try and advance the triume to 65' and immediately start grouting at that point - however, at this point the water connection is still broken.

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9.1.92

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- Clinton is checking out to see when it is going to be fixed.
- 0930 Adding 10' to triume string now at 45'.
- 1000 Wanda reports triume is at 65'. They are going to try grouting through the string up to the casing.
- 1010 Bringing in grout machine.
- 1020 Beginning to pump grout down hole.
- 1025 Remove 10' from string, now 55'.
- 1030 Remove 10' from string, now 45'.
- Removed 10', now 55'; removed 10', now 25'; removed 10', now 15'; Removed last section.
- 1035 Now adding triume pipe. Grouting.
- 1050 Beginning to put 3" casing. Remove first 5'.
- 1100 Call to call Sally Odland in NYC - left message with secretary.
- 1130 Tunito reports grout is almost to surface. Drillers continue to remove casing.
- 1135 Stopping to add more grout.
- 1150 About 20' casing out - stopping to add more grout.
- 1200 Pumping and mixing grout.
- 1215 Breaking for lunch.
- 1300 More water - more grout and pumps.

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9/1/92

- 1330 Casing pulled from hole
 1340 Large Casing pulled - ^{5th} New-6 has
 been grouted to surface. At last!
 1410 Cleaning up grout machine, casing,
 tremie, rig, etc.
 1430 Breaking down trireme rods, casing
 1510 Drillers are still cleaning up area,
 have moved small rig to side - Just to
 save grouting took more time than they
 than thought. Drillers are not planning
 on beginning replacement for New-6
 until tomorrow.

1750 Spoke with Sellen Odland

CDM FPC

107F Corporate Blvd

South Plainfield NJ 07080

(908) 757 9500

Department of Natural Resources

E 724 3320 - Mr. Leonard Reed

Macaulay (Secr.)

Nisley Centre, Suite 231 #45A

Bill Holden

(111)

Bill Holden

9/1/92

- 0740 Arrived at site. Drillers have 13' 50
 set up at New-6 and are already drilling.
 Drillers at 10'. Getting ready to add a
 2nd ⁱⁿ 15' rod. Weather has been (and
 yesterday - hot, hot, hot, and humid -
 0800 Drillers down to ~ 13', continue casing
 Still using only air.
 0810 Adding second 15' rod string now 30'
 0830 Down to ~ 26' Wanda Morales said they
 drilled 2' more than they needed due to
 casing. Clinton is determining if they
 can use the same screen as they pulled
 for this well.
 0845 Wanda said Clinton would like me
 to come to the office.
 0900 Clinton informs me he would like to
 use the same screen they pulled for
 Wednesday in this well. After discussing
 what I wants to know if this is a
 problem. I told him I was a little
 curious as to why it took him a whole
 week to bring this up at the last
 minute.
 0915 Spoke with Sellen Odland - she does
 not have a problem with this a long

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as the screen is damaged before they use it. Also said to call the DNR office at noon to see if material can be stored there.

0930 Returned to MW-6, drillers are pulling rods (string) from hole. Wanda is measuring the depth. Hole is plugged at 22' 10".

1000 Drillers are replacing drill in hole.

Repositioned 30' string in hole.

1030 Still flushing out hole.

1040 Pulling string from hole.

1050 Wanda measuring depth. Hole is now plugged at 20'. This hole is definitely being stubborn. Drillers are replacing tool in hole.

1100 Timbo says a large rock has collapsed from the side into the hole - probably a consequence of the fill conditions here. The drillers are using the rod to try and push it.

1110 Drillers have got 30' string in hole again.

1130 Driller flushed hole, now having trouble pulling string out.

1140 Wanda reported drillers will be adding

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water to the hole.

1150 The water has allowed the string to be pulled from the hole.

1220 Drillers flushing hole - left site for lunch.

1310 Tried to contact DNR - need to call back at 1420.

1340 Returned to site - Wanda reported. Drillers have continued getting stuck. They are continuing to flush/clean out the hole.

1420 Wanda mentioned sometime they stop the hole at 27', it collapsed a bit, they are going to try taking it down to 24'.

1500 Drillers pulled string - hole has collapsed to 18'! Truly the hole from hell! They are going to try and put in a 6" casing, and install the well through it. Drillers have left to get casing.

Clinton is transferring the information from the data probe in MW-6; now we will soon know if well needs to be replaced.

Drillers need to go to Charlotte Amalie to get casing. This will take about one hour. I am returning to the apartment to begin packing books.

Bill Holden

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for str sharing at DNR (called at 1420 OK to store there). (Take tomorrow between 9 and 5).

1610 Arrived back at MW-6. The drillers have returned ~~to~~th with the 6" casing - they are steam cleaning them over at the Texas station.

1640 Drillers starting to put 6" casing down hole. Clinton has informed me they need to add another well at MW-9.

1655 Drillers have pulled 15' of 6" casing down - now adding last 10' (total length 25').

1710 Pushing casing into ground.

1740 Stopped to add another rod to the string.

Casing about 14' into the ground.

1810 Casing about 22.5' into the ground.

1850 Ramping bar - Clinton says they are going to try and steam the casing clean, and then set the well.

1940 Tanito measures 23.5' on the rods.

Pulling rods from hole and getting screen ready.

1950 Screen placed in well.

2010 Wirth measures well depth at 23' 6"

2015 Began adding sand

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9/2/92

Bill Holden

2020 Pulled all 25' of casing out (?) Tanito and Wanda M. told the drillers to do this.

2030 Drillers have left to get more sand

2035 Brief rain storm

2100 Drillers return with sand

2110 Finally got 5' casing off, removed other 20' feet, began adding sand.

2115 Need more sand. Tanito estimates 20 more bags.

2130 Drillers have run out of sand. They will not be able to finish MW-6, will not be able to do MW-15 tomorrow. More sand will be needed from Puerto Rico - They are going to cap this well, clean up site, and fence it in. Left site for day.

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Bill Holden

9/3/92

- 0730 Packed up supplies in apartment.
 0815 Called Sella Odland in NYC - won't be in until 0930.
 0930 Spoke with Sella - told her due to send problem, wells may not get completed until next Tuesday. Sella wants supplies to go to DNR.
 0945 Packed supplies in van.
 1030 Clinton said there is a chance sand may get here by tomorrow. If so 2 crews will work tomorrow to finish wells.
 1130 Found DNR at Ninsky Centre - stored 7 coders (eachally 6 coders and 1 box) in store room - marked boxes "CDM FPC 1 of 1", "2 of 1", etc.
 1230 Shipped HNU from FedEx at Airport.
 1430 Loaded up seeds, new HNU to store at GEM Warehouse.
 1445 No one at GEM Warehouse / Office - drove to M-6, drillers cleaning up area. Tom to send no sand till Tuesday.
 1500 Dropped off seeds and HNU at GEM.
 1510 Clinton confirmed that no sand will come until Tuesday.
 1530 Back home - called Sella.

Bill Holden

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Susan L. Flakus 9/8/92

(117)

- 0720 Arrived onsite. No one from Soil Tech ^{of} Jarahy & Miller (GEM) present.
 0830 Calling GEM office, no one there.
 0840 Meet Ruben Poncaup (RP) of GEM onsite. He arrived onsite and is waiting for remaining personnel plus send for HNU/G. The weather is sunny, humid, ~90°F.
 0850 After discussion of last week's activities plus this week's, Ruben Poncaup (RP) and I go to the GEM office. To check the HNU - it was not plugged in over the weekend to charge and the battery check is negative, so have plugged in HNU to charge it. I am given GEM health & safety plan to review (extent of H+5 bonding).
 0900 Personnel from Soil Tech (ST) and GEM arrive at GEM office. These include: GEM - Derek Stepenoff (DS) (OS) Bingham Ken Kamzar (KK), site chemist ST - Tonito Ramos (TR) - field supervisor plus foreman and two assistants.
 0920 Return to site. R.P. & DS. from GEM are going to police station at the Four Winds Plaza to check about creating an exclusion zone around MW 93 as several cars are parked there.
 9/8/92 S.L.F.

(118)

Susan L. Flakus 9/8/92

0921 I continue to review site documents.

ST personnel are getting sand needed to complete the well installation @ 6 ft. The level of personal protection today has been level "D". There is little likelihood, according to R.P., that level of protection will need to be increased, but this will be monitored. (Hope to get HME charged up).

1030 There have been problems with removing parked cars from the exclusion zone for MW95. Owners of vehicles are being determined and located, if possible.*

1055 ST have moved their drill rig to MW95.

There is no well development occurring currently. R.P. has been back at the G+M site office.

1050 Note: MW95 is located in the parking area across from the police station @ Four Winds Shopping Mall.

1130 Still waiting for last car in @ ST the exclusion zone to be moved. It is a government vehicle but the police

officers^{rs} cannot locate who the owner is. Also, the G+M and ST crews are still waiting for the sand to arrive in order

SL7 9/8/92

*Note Today is an election day holiday.
9/8/92 - S. Flakus

(119)

Susan L. Flakus 9/8/92

to complete MW65. RP confirmed that there will be no well development today (will be performed tomorrow).

1135 The police agree to have the last car towed to a nearby parking spot. Jim (DS) has called in for a tow truck.*

1200 Note: Discussed with RP the structure of MW65. The screen will start at 29 ft and rise 20 ft to 9 ft.

1215 Have been discussing calibration procedure w/ K.K. who does the onsite G.S.

1222 DS is calling towing company again to find out status.

1225 DS says that they are leaving now.

1235 Leave site for lunch as the tow company will take a while to get here.

1335 Return to site from lunch.

1340 Tow truck arrives from dropping off another car. The towing personnel^{w/ get 578} said that the car is a rear drive, so to tow from the front (the only way) would cause damage. They could tow the car with no damage for extra charge. DS

said fine. Then, they were trying to find key and wondering who the

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(120)

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1340 Owner was, perhaps an official, drove off when they could not open the door.

1400 An official who drove up said that he might be of help in locating the owner. They are checking with two names.

1415 Note: R.P. is counting the drums storing waste.

It has started to rain. The weather is approximately 80° to 88° now.

1435 Checked in with Sally Odland - gave her status report of the day's activities and current problems with creating an exclusion zone.

1510 R.P. has returned to the site. The car is still there; no owners located.

1525 R.P. and D.S. are going to pick up coolers that should have arrived today. TR of ST has gone to check on the shipment of sand.

1600 Still no return of crew with sand.

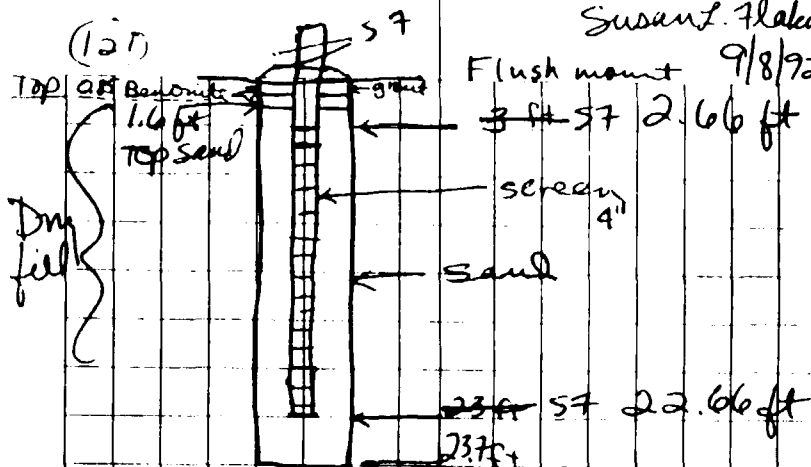
1610 Crew returns with sand and starts pouring into NW 6R. They had stopped at 9.5 ft b.g.s. on previous day. The top of screen is @ 3 ft b.g.s.

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(121)

Susan L. Flakus

9/8/92



Using 100 lb bags of sand (one cubic ft).
1630 Crew (ST) continues to pour sand. Note: the flush mount for NW 6 has been correctly finished, as per the g+m plan (rounded off cement). g+m personnel (R.P.) measuring sand and overseeing operation.

1632 Weather is overcast, approx 80°. Crew is using Texblast blasting sand.

1650 The sand was filled to 1.6 ft b.g.s. Bentonite pellets were added to a thickness of 0.85 ft. Grout to g.s. (1.75'). The hole @ g.s. is ten inch diameter. For 10 ft ST the hole is larger ST has a wider diameter further down hole.

1700 R.P. relates that will not have the

SLT 9/8/92

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bentonite layer any thicker (0.65 ft is as close as may get) considering the initially installed depth of the screen.

1705 ST crew has ~~arrived~~ ^{started} to grout. First, potable water is being ST added to backhole.

1730 Crew has finished grouting well and is adding ST creating well coverings/cement. This well is flush mounted.

1800 Well installation operations for MW6R complete.

1805 Finish discussion with R.P. and site personnel exit for day.

(Will meet @ 7 am tomorrow)

SFA 9/8/92

(123)

Susan L. Flakus 9/9/92

0700 Susan Flakus, notetaker, arrives onsite. No other personnel onsite. The weather is overcast, humid and ~70°. The car is still parked at Well site 9S. (RP) ST

0707 Ruben Bouciano arrives onsite. He goes to police office to check about the car. Susan Flakus (SF) goes to check MW6R. DS onsite as well (Kirk Steppanoff).

0710 Note: Today's activities will be the installation of MW9S (provided the car will be moved). Also MW6S development.

0718 Soil Tech (ST) crew arrives onsite. DS states that police have said they will move car by ~11:57 0700.

0725 Owner of the car comes out and removes it. ST crew is backing up rig into place.

0740 ST crew starts air drilling.

Using Mobile drill B-90. Note: Jim & ST are not using an HNU by choice of R.P.

0825 Continuing to rain. Starting adding potable water downhole. They have drilled to ~16 ft bgs. The water was sampled previously in June.

SFA 9/9/92

* drilling fluid
potable water
- SFA 9/10/92

(124) Susan L. Flacus 9/9/92

0835 ST + g+m take a work break.

0900 ST + g+m resume work.

0910 Air compressor not delivering air properly.

0915 ST crew from another project stop by. R.K. on site now. There is a leak in one of the air compressor fittings. They are down 23 feet now.

0925 T.R. is going to check about fixing compressor.

0930 Have shut off the B-90.

0958 ST foreman started up rig again.

Note - D.S. watch is 5 min. slower than SF watch. According to D.S.

The ST crew received the "go-ahead" from their office in Puerto Rico to resume drilling.

1005 Note: The exclusion zone is no longer marked off. Advised D.S. that at a reasonable point SF this should be corrected. He did so immediately.

R.P. has been off site for awhile.

1020 Reaming stopped. Not enough air pressure to throw cuttings. Hammer's motion is thus restricted. ST is speaking to rental company #57 of the rig to troubleshoot mechanical difficulty.

SF 7 9/9/92

ST

(125) Susan L. Flacus 9/9/92

1050^{SF} Called Sally Odland with update.

1100 SF leaves site for g+m office to check on HNu and ask R.P. to get their HNu on site.

1105 R.P. informed SF that the HNUs for g+m have all been shipped back. SF called Bob Aitken of CM FPC about the HNu not functioning. SF checked on HNu. It is not operational so am sending back to warehouse.

1130 SF has packed up HNu. As there is downtime now with drilling, SF goes to Federal Express. ~~Arb bill # 400-6629-2041~~ SF to ship

HNu # 400-6922-3372 is used (Arb bill).

1230 SF stops for lunch on way back from Federal Express.

1300 SF continues to site. Upon her arrival on site, she hears report from D.S. that there has been no change in the status. G+m + ST are still trying to get someone from the drill rig company to come troubleshoot.

1345 T.R. of ST confirms that the person will not be able to arrive until tomorrow. As there will be no more drilling for

SF 7 9/9/92

(126) Susan L. Flakus 9/9/92
The day, RP has directed DS to
develop MW 6R today. DS is
preparing for this.

1350 SF at MW 6R. SF will provide
EPA representative oversight of this
full operation as it is only
remaining operation today.

1355 SF calls Sally Odland with
the current status while waiting
for DS to arrive at MW 6R and
mobilize. While calling, SF notes
that ST crew is securing the exclusion
zone around MW 9S location.

94/5 DS continuing to set up for
taking a water level measurement.

The purging equipment is coming.
Note: DS is taking care not to let the
water level indicator tape touch the
ground (has donned dedicated gloves as well).
DS is decoupling tape w/ soap & water.

(mizodetergent spray). The
submersible pump is being decoupled
by ST personnel @ decon station.
Good care & demonstrated by DS that
no contamination ~~as~~ might occur.

SF 7 9/9/92

(127) Susan L. Flakus 9/9/92
in well from purging operations.

1430 MW 6R is opened. Water level
measurement is taken from the north by DS.
Water is encountered @ 8.2 ft. ~~but~~
from the top of the casing (north side).
Sounding - 22.84 today w/ water
level probe. (Yesterday the ~~reading~~ ^{sounding} ST
was 22.66). DS calculated
the volume of casing is 9.52 gal.
 $22.84 - 8.2 = 14.64 \times 3.14 \times 0.65 \text{ (gal/ft)}$
 $= 9.52 \text{ gallons (4 inch well)}$

1500 - ST Crew plus DS. Still
setting up for purging. ST personnel
include those present yesterday
plus Papa Gonzales who will be
doing the purging (Papa Coleman Downstate).
Note: Tubing, pump and dedicated
line ~~have~~ ^{are} been kept off the
ground. Tubing is dedicated.

1520 - Start purging MW 6R.

RP here to do purging as well.

Water from well is yellow-brown, ~~sooty~~.

1530 Water turbidity is still poor. The
water is being purged at a rate of
~~one~~ gallons per minute. So far
nine.

SF 7 9/9/92

(128) Susan A. Flakus 9/9/92

The water remains yellow/brown w/ dirt. J+M plans to purge until clear (per R.P.).

J+M have noted a trace of product in the water throughout pumping.

1547 A sample in one VPA well was taken from tubing outstST for analysis (GS) at field lab in J+S office. R.K. will perform analysis. Water has cleared somewhat. It is still a pale yellow.

1548 RP is taking the sample to the lab.

1549 Depth to water is 10.5 ft. Approximately ST 1 ft. Water has stabilized (water level).

1600 R.P. returns. Water has cleared considerably.

1610 Stop purging. According to J+M's watch, the purging lasted 54 minutes. 54 x 9 gallons = 486 gallons purged.

At 57. Intake @ 20.66 ft below casing top (two feet above bottom of screen).

1630 SF ST Crew (ST + J+M) have been packing up purging equipment.

SF leaves site for day as there are no more field operations necessary for her to observe.

ST 9/9/92

(129) Susan A. Flakus 9/10ST/92

0810 Susan Flakus (SF) arrives at the J+M office to meet with Robert Romano (RP) (field team leader) who is ST 57.

The weather today is sunny, humid and ~90°.

The scheduled activities today will be taking water level measurements at all currently installed wells, sampling of drummed waste, and fixing air compressor of

rg. The Soil Tech (ST) crew will be cleaning heavy equipment and getting ready for shipment, assistance with moving drums, and potentially resuming drilling operations provided the compressor is fixed. Tonito Ramon in office as well.

0815 Derek Stepanof (D.S.) at J+M office.

0820 RP and D.S. are going to collect the waste samples.

1030 The air compressor may have been fixed, but after trying, it is not working. ST needs to get more parts.

1245 RP is packing samples (waste samples).

1250 SF heads down to drilling in case they get parts and are able to resume drilling.

1350 ST crew members have returned and are trying to fix drilling.

ST

9/10/92
ST

(130) Susan L. Flakus 9/10/92

1445 R.P. is going to take water level measurements. SF will stay by drill rig as ST personnel project that it may be running within 15 minutes or so. D.S. is staying by rig as well.

1450 Note: The top 53 1/6 feet of borehole for MW 9S has collapsed (earliest today). Cuttings from this top section will need to be forced out by compressor when it becomes operational. The collapsed section was reported earlier today to SF by R.P. and T.R. (ST).

1455 Note. SF had discussed the need to sample the drinking, potable water again with Sally Odland, COM FPC project mgr during yesterday's status update call. She said that there was no need to as there was the one sample taken earlier, plus another as ordered by Pam Philip when the ^{30" x 24" 1/2" same 3"} faucet source was changed. Also, EPA has stated that additional monitoring of water will occur and has occurred during other sampling events (i.e. water). The water supply is from municipal supply. This supply has been sampled in February.

SF 7 9/10/92

(31) Susan L. Flakus 9/10/92

1500 The ^{(air compressor) ST} MW rig has been restarted. They will try again.

Note. D.S. had performed soundings of MW 9S and determined that the top 14.4 feet are still stable (contrary to previous note on page 130) but that the cuttings between 14.4 feet bgs and 24 feet bgs have not been forced out. SF will clarify the discrepancy with these observations.

1510 Have set up and started to re-drill MW 9S.

1520 Note: Cuttings still not coming up.

ST had previously removed a rod and are now going to install another to see if this will assist in forcing the cuttings up.

1545 Drill rig shut down. Cuttings are still not coming up even though there is enough air pressure.

1555 JMMV ST have decided to get 6 inch casing to help restrict the air flow and increase air pressure as a cavity has been created downhole. This is a similar situation to MW 6S ST 6S. The four inch casing will be installed within the six

SF 7 9/10/92

(132)

Susan & Flakus 9/10/92

inch casing. ST + JM are mobilizing for this operation.

1600 Susan & Flakus (SF) calls in this change in status to Sally Oakland. Want to find out which wells have been measured for water levels.

1700 ST + JM continue to mobilize.

The six inch casing is being deconned.

1715 ST truck arrives w/ deconned casing.

1720 ST crew starts up rig. Are removing rod in ST and drill head down hole.

1730 The R34 rod and drill head have been removed.

1740 ST crew installing 6 inch casing.

(Deconned casing is being kept on plastic. Casing is stainless steel.)

for RP says that the water levels are measured for MW-13D, 1D, 1, 14, 3, 4D, 4, 2, 6D, 6R, 8, 10, 10D, 11D, 12D, 7.

1800 Weather has cooled somewhat with

getting surplus breeze.

Six inch casing is down 16 feet bgs.

ST crew is getting rod ready to drop inside casing.

1810 ST crew has started flushing out hole.

This method appears to be working.

SF 7 9/10/92

(133)

Susan & Flakus 9/10/92

1812 Cuttings are being collected in drums from hose connected to 6 inch casing.

1815 RP notes that there is no trace of product in the cuttings.

1825 ST crew is forming drum to inch casing with rod. Cuttings still being flushed during this process. Rod is being driven.

1845 ST crew is adding another 5 ft length of 6 inch casing. building up

Note: Light from adjacent police station plus drilling lights seems to have ST be sufficient.

1855 RP goes to assist D.S. who has been taking WL measure. * (water level measure is only)

1900 ST crew is continuing down hole (slowly).

RP has returned to MW 9S location.

1930 Drilling shut down. Letting air compressor cool down. The casing is down 22 feet bgs.

2000 Resume drilling - took dinner break while air compressor was cooling.

2015 Note: RP has been (also D.S.) diligent about maintaining an exclusion zone despite a constant stream of cars and pedestrians.

SF 7 9/10/92

(134)
(2015) Susan L. Flakus 9/10/92
"Passing by MW 9S. This shopping area is heavily used.
2020 D.S. continuing w/ his wks. of JWM installed wells.

Note: The ST crew regularly cools the air compressor line with hosed water.
2025 RP said that the ~~best~~ TCP/RRA Hazardous waste Characteristics Samples were collected from cuttings produced during this phase of well installation. (19 wells). He collected 1 - 1lt container
1 - 250 ml container + 2 125 ml containers.

2027 Drillers have reached depth that was drilled to yesterday (29 ft bgs). Are continuing to cut down to 30 ft bgs.
2030 They are at ~ 22.5 ft bgs now.

2045 - ST crew is giving air compressor a cooling off period. RP to office.

2059 Resume drilling.

2115 D.S. arrives @ MW 9S.

2125 R.P. examines rock in cuttings - appears to be volcanic sand.

2130 Drillers down ~ 26 feet bgs.

2135 RP reports to SF that there may be a loose section of 6 inch casing.

SF 9/10/92

(135) Susan L. Flakus 9/10/92
2136 ST crew is ~~continuing~~ to drill for ST now ST investigating this possibility. Indication of loose section was that drill was not advancing.

2138 Air compressor shut off to allow it to cool.

2145 ST has resumed ~~operations~~ ^{drill operations} ST

2200 Air compressor shut off. Borehole depth is being measured to try to locate loose casing. [Note: D.S. is still taking W.M.s.]

2210 ST crew is working on removing loose casing section. (D.S. finished 2225) ST

2220 RP informed SF that since the casing that has become loosened is irretrievable in that the borehole has collapsed around casing, the boring will be grouted tomorrow. Also, the air compressor has continued to be temperamental. Therefore the MW 9S will be redrilled next week to allow for a thorough overhaul of the air compressor. ST ST confirmed the condition of the top 10 ft of the borehole, to the top of the loose casing. Status will be updated tomorrow.

2235 SF leaves site for the day as operations have stopped.

SF 9/10/92

(136)

Susan L. Flakus 9/11/92

0753 Susan Flakus (SF) on site. ST crew is demobilizing rig after last night's drilling. MW9S will be grouted.

0815 R.P. states that D.S. is continuing w/ w/lms. Also, ground water samples will be taken to run through the field ge. These samples will be taken from MW-4D & 4.

The crew (ST & GYM) will clean up well location 9 after demob of equipment is completed.

0825 D.S. finished w/ w/lms. Nine has not been done due to drill rig.

0830 SF calls in with ^{MW} status to Sally Odland. She wants to know -

Why 4D & 4 being sampled?

W/lms do not need to be recorded at this time.

0852 SF goes to GYM office to find out status of future drilling/equipment repair/overhaul. ST crew has begun grouting MW9S.

0900 K.R. informed SF that he wants to analyze 4D & 4 to complete characterization of the aquifer in the area of MWs 3 and 5, which were

SLF 9/11/92

(137)

Susan L. Flakus 9/11/92

analyzed. MW5 had a hit of 1600 BTEX. 0910 SF discusses status of drilling w/ TR & ~~Peacher~~ ST. Peacher has contacted mechanic to return to the site today and work through the weekend to rehaul air compressor. Due to the heat and humidity, excessive stress has been placed on the air compressor. This causes the steps taken yesterday evening to cool off the machinery & connecting hose.

0915 R.P. came in with sample from 4D.

Tom Denehy, of GYM has shown up on site. ST has been discussing problems w/ MW9S w/ the ST boss also w/ mechanic.

0925 Peacher mentioned that they will be sampling the production wells next week. (28 wells)

0936 Tom Denehy ^{R.P.} shows up at the GYM office. He is the project manager for GYM.

0942 Tom Denehy discusses new plan w/ ST personnel (T.R. & Peacher). He also is ^{MW} called Sally Odland about new approach. This is to not drill as deep (29 ft & 9S), but rather to about 20 ft & 9S and install a shorter length (< 20 ft) of screen that reaches the water table level fluctuations which

SLF 9/11/92

(138)

Susan L. Flakus 9/11/92

according to T.D. are less than may have been previously anticipated. The drillers will not be able to start drilling today. They are cleaning the area now around mud 95.

1005 T.D. states that Sally Odland agrees to shallower depth. A 10 ft. screen will be used, approximately from 10' bgs to 20' bgs. If possible, will drill to 25' bgs.

1010 SF asks what screen length to be used if the drilling is to 25' bgs. as the water table is ~ 13' bgs. He said that the screen will start @ 10' bgs down to 20'. Also need to add 1 extra foot for sand (to 21') below the screen.

1035 Confirm with Sally Odland the revised well construction (depth, screen interval) as related by T.D.

1050 SF leaves G&M office and site for the day. Field operations are complete for this week as the drillers & G&M will resume work on Monday.

~~Susan L. Flakus~~

SF

9/11/92

(4)

Tutu Wellfields St. Thomas USVI

9.28.92 - Susan Collagan (5)

0740 - Leave Ramada Yacht Haven
to go to DPNR to pick up
and inventory supplies for
groundwater sampling event.
Susan Collagan representing
CDM Federal will split
groundwater samples w/
Gaugherty & Miller (GBM)
field team.

Weather: Clear, sunny humid.
~ 80°F.

0810 Meet Miss McCauley @ DPNR
load coolers and supplies
into minivan. Quick inventory
No vermiculite for packing
No HPLC water for blanks
No Acids - should be in w/
GBM's equipment

0855 To Pueblo to pick up small
supplies - ice, bags, water

0920 To Farmers Cabinet/glass
shop @ Subbase to pick up
some saw dust for packing

Susan Collagan

⑥ Tutu - Wellfields St. Thomas USVI

9.28.92 - Susan Colligan

1035 Laura Soalise - EPA

Suzanne Tramontan - EPA

Arrive @ Soil Tech G&M

Attempted to reach Sally Odland at home no luck
busy. EPA reps introduced themselves

1130 Reach Sally Odland to get info on preferred well sampling.

- Curriculum Building

- Tillett (MW-5; 7)

- Esso (MW-9)

- O'Henry

- Esso / Texaco

Clinton Moffett gives field meeting to all field personnel. EPA and CDM.

2 Field Crews:

1.) Purge Crew

2.) Sampling Crew

1200 Only find HCl and HNO_3 for Acids one

1220 Purge crew to Esso to decom down hole equipment.

Susan Colligan

Tutu - Wellfields St. Thomas USVI ⑦

9.28.92 - Susan Colligan

1230 Break for lunch

1310 S.C. begins to prepare glassware for tomorrow's samples

Rubin Forcianso of G&M informs me that they will not be sampling today.

But they will begin sampling tomorrow @ MW-8.

1430 S.C. Back to G&M trailer to work on Glassware for tomorrow's sampling event

- Clinton tells me that tomorrow they will sample MW-8; 6; and 6D. Possibly one more. I mentioned preferred locations and G&M will try to accommodate CDM as best they can.

1430 Finish preparing glassware and paper work for TB, FO, MW8. Leave Smith Bay.

Susan Colligan

⑧ Tutuwellfields

9/29/92 - Susan Collagen

0650 Arrive Smith Bay

Weather: Clear, Sunny; humid ~ 80°F

0930 Trip blank poured using GBM's
lot of deionized water.

GBM pours their trip blank

-All trip blanks poured in

GBM trailer (office)

-GBM purge team heads out
to MW-8

-EPA arrives.

0905 GBM Mobilizes on MW-8

0825 Begin Purge MW-8 ~ 5.5 g/1 vol.

H₂Nu 0.0 ppm on well headspace

	COND (µS/cm)	PH	Temp (°C)	OVA PPM
Vol 1	1252	6.7	32.8	0.0
2	1370	6.88	33.2	0.0
3				

DRY

0850 Well purged off

0900 Sample team begins decontam
bailers.

1040 Field blank taken by
pouring deionized water
from a decontaminated bailer.
(cont pg 12)

Susan Collagen

Station	Location	Sample Number	Tag Number	Analysis	Date/Time	Remarks
1	RTB-01	BHB51	10652, 53	VOA	9/29/92 0930	HCE - Trip Blank
2	STB-01	7511B-02-01	28507, 08	VOA, MTBE, BNA, Metals, Cyanide, TPH	9/29/92 0930	HCE - Trip Blank
3		BHB52	28509, 10	VOA	9/29/92 1040	HCE Field Blank (Rinse)
		7511B-02-02	28513, 14	MTBE etc.		
		BHB52	28511, 12	BNA		
		MEG061	28515	Metals		
		MBG061	28516	Cyanide		
		7511B-01-01	28517	TPH		
4		BHB53	28518, 19	VOA	9/29/92 1315	HCE up-winds
		7511B-02-03	28523, 23	MTBE etc.		
		BHB53	28520, 21	BNA		
		MEG060	28524	Metals		
		MBG060	28525	Cyanide		
		7511B-01-02	28526	TPH		

⑫ Tutor Wellfields

9/29/92 - Susan Collage
CDM Federal bottles were
alternated with GBM's bottles
and collected in the following
order:

- 1) VOA
- 2) MTBE; n-propylbenzene...
- 3) BNA
- 4) Metals Cyanide
- 5) TPH

Deviations:

① This order is a deviation from
CDM Federals Broome QAPP
where TPH comes after
organics. EPA's Laura Scalise
agreed with the order listed
above.

② ^{Another} Deviation from ^{the} 5/92 QAPP is
the use of HCE to preserve
TPH. CDM Federal used
HCE as well as GBM <sup>EPA also
agreed</sup>

③ A deviation from GBM's work
plan/QAPP is that they are
also sampling for dissolved
METALS. CDM Fed is not

Susan Collage

Tutor Wellfields

⑬

9/29/92 - Susan Collage
splitting for dissolved metals.

1130 GBM Sampling MW-8 on
ESSO. CDM Fed intended
to split here but due to
slow recharge rate and
shallow water column - We'll
split at next location.

1210 - Break for lunch

1250 - Mobilize - MW-6R

1315 - CDM Federal expects a
split sample from MW6R
1400 - Return to Smith Bay
pack samples complete
paperwork.

1510 - Lora Scalise holds a
closing meeting for the
audit process. Overall
EPA was please w/ everyone's
performance on the site

1600 Arrive Fed Ex

1640 - Call Vaser Desikan

1655 - Call SMO

1755 - Arrive Ramada Yacht Haven

Susan Collage

⑭ Tutu Wellfield

9/30/92 - Susan Colley
0745 Arrive Esso. Sampling team preparing to take field blank.

Purge team mobilizing @ MW-2 in front of Pueblo. Clinton Moffett wanted to get this location done early because of parking difficulties. Clinton forecasted daily activities as MW-2; MW-6D, MW-4; MW-4D.

0900 Go to Woolworth to purchase coolers.

Call Sally Odland to update her on events.

Call Vasu Desikan to check on trip blanks for (additional slots) for next shipment. Trip blanks will be needed for both RAS VOA and MTBE.

0925 Return Esso sampling crew preparing to sample MW-2. Purge team mobilizing @ 6D.

Susan Colley

Tutu Wellfield

9/30/92 - Susan Colley ⑮

Purge Crew having trouble with pumps @ 6D. Purge data: MW-2:

	pH	Temp	Cond	PID
1 129	6.86	30.1	1321	0
2 1059	6.98	29.8	1317	0
3 149	86.96	30.6	1314	0

Purge Data MW-6D

	pH	Temp	Cond	PID
1	6.88	31.2	1283	94
2	6.83	30.2	1309	0.0
3	6.79	29.7	1316	0.0

<u>MW-2</u> (Measurement from top casing)	
Total Sounded depth	26.9 ft.
Depth to water	12.64
Water Column	14.26
Gallons/foot	0.65
Gallons in well	9.26

Susan Colley

(16) Tatu Wellfield

9.30.92 - Susan Collinge

1012 Purge team begins to purge.
MW-6D.

1023 Sampling team completes
sample @ MW-2 except
filtered metals which they
do back @ ESSO (staging
area)

1112 Finish Purging 6D.

1135 GBM Samples 6D.
Purge team @ MW4

1200 CDM Fed pours trip blank
for YOA and MTBE

1230 CDM Fed prepares glassware
to take split at MW-4.
will get additional
volume to cover MS/MSD.

1330 Sample collected at.
MW-4.

Purge team at MW4D
1430 Sample team at MW4D
CDM Federal breaks for
lunch. Update TR's

1500 CDM Fed to Smith Bay

Susan Collinge

- Tatu Wellfields

9/30/92 - Susan Collinge

GBM Field teams packaging
samples for export to PK.

Clinton says tomorrow
they will sample MW-1,
MW-10 and MW-14.

CDM Federal will need
to get two locations.

Since it's difficult to track
information (Well data)

While split sampling - CDM
Fed will collect a groundwater
sampling log for each well
at the end of the sampling
event

1610 Leave Smith Bay.

1645 Check @ desk of Ramadan
- no Fed Ex (Hnu) will
have to have Sally put
a tracer on it.

~~Susan Collinge~~

Susan Collinge

① Tutu Wellfield - St. Thomas

10.1.92 - Susan College

0740 Arrive Smith Bay

Clinton Moffitt says they will try and accommodate desirable wells for splitting samples by collecting @ MW-5 in the Tullett Gardens area and MW-1 and 14 in the Laga Building area.

Although ~~he~~ he had just learned from Rubin Ponciano that all wells in the Laga area are probably very slow rechargers.

- Purge Team evacuating MW-5

- Sample Team collecting field blank

- CDM Fed. preparing glassware and paperwork for collecting split at MW-5.

0930

Attempt to reach Vasa Desikan Call Sally Odland inform her that HNU never arrived and that a tracer will need to be put out

Susan College

Tutu Wellfield - St. Thomas ②

10.1.92 - Susan College

Also inform her that I'll be getting a split @ MW-5 and one well near the Laga building.

1000 CDM Federal excepts a split at MW-5.

Purge crew working on MW-14

1200 CDM Fed breaks for lunch.

1230 At MW-14 prepare glassware for split

1300 take split sample MW-14

1420 Purchase ice and package samples at Smith Bay.

1545 Arrive Fed Ex

1635 Call SMM report sample shipment.

~~Susan College~~

Susan College

(20)

Tutu Wellfields

10.2.92 - Susan Collyer

0720 Arrive Smith Bay Clinton
and Alberto are preparing
for today's sampling (MW-1;
1D; 11D)

0845 Sampling team deconing
bailers and filtering devices
Purging team Evacuating
MW-1 and MW-1D

0910 Sampling team pours field
blank through newly decon-
taminated bailer. Filtered
metals field blank sample
taken by pouring Deionized
water from the bailer to (through)
the filtering device.

0930 Sampling team collects a
sample at MW-1
Purge team finishes purging
MW-1D and proceeds
to MW-11D.

1105 Sample team takes a
sample at MW-11D this
location will be used for
the MS/MSD.

Susan Collyer

Tutu Wellfields

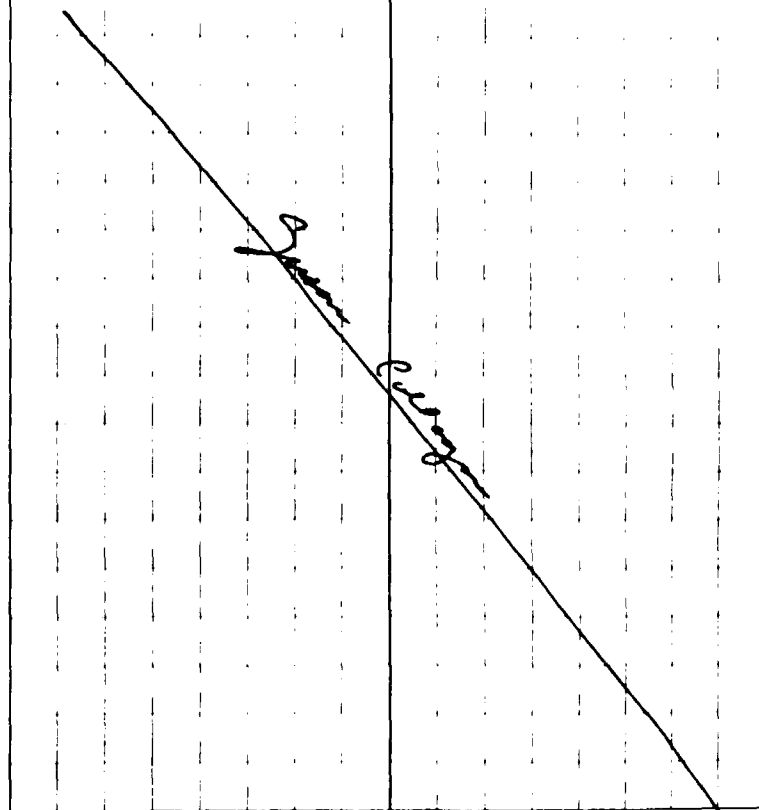
(21)

10.2.92 - Susan Collyer

1200 Noon - break for lunch

1240 GBM-Soil tech teams
cleaning up putting
equipment away - packing
samples.

1400 Leave Site.



Susan Collyer

(22)

St. Thomas - Tutu Wellfields

10.5.92 - Susan Collegen
0815 Arrive Esso Staging area - Sampling team deconing bailers and preparing to take field blank.

0900

Four trip blank

1030

Four field blank

Intended schedule for the day is 12D; 7; 4D.
subject to change.

Purge crew at 12D.
now finishing purge.

1050

Purge crew moves over to MW-7.

1130

Sample taken at MW-12D

1215

Purge crew moves over to MW-4D.

1230

Sample team collects sample at MW-7. A field duplicate was also taken at this location. (MW105)

1310

CDM breaks for lunch

1345

CDM Fed @ Texaco - Purge Team finishes @ MW-4D

Susan Collegen

St. Thomas, U.S.V.I.

(23)

10.5.92

Susan Collegen

1400

Take sample @ MW-4D.

GBM could not preserve this sample due to the bubbles found (effervescent like) this has been a problem in the past, so they have an agreement not to preserve if bubbles persist.

1510

GBM field office - Sampling team is at packaging today's samples for export to PR.

Ruben Ponciano is at MW-9, where in checking the well w/ an oil/water interface has found one inch of product in the well.

1600

Leave Site

Susan Collegen

Susan Collegen

② Tutu wellfields, St. Thomas
10-6-92 - Susan Collage

0530 CDM Federal arrives staging area at Esso. Sampling team deconing sampling equipment. Purge team evacuating MW-10 and MW-10D in car wash. Teams had to start early to finish these wells before the car wash opened at 8AM.

0605 Purge team finishes evacuating 10D. Decons pump etc.

0710 Finish Purging MW10. Trip Blank and Field Blank have been taken.

0730 Purge team will return to MW10 to evacuate one more well volume as conductivity had not yet stabilized.

0735 Sample team begins to sample MW-10D.

0800 Water column very shallow. Must wait for recharge (MW10). Sampling team decons more.

Susan Collage

Tutu Wellfield; St. Thomas ②5

10-6-92 - Susan Collage
Trailers. Purge team goes to MW-1. MW-1 is being resampled due to shipment being held up and inspected in Memphis. Holding times blown.

0900 MW-10 sampled.

0915 Call Sally Odland to let her know project status. Tell her sampling will be complete by tomorrow. Will contact her tomorrow to let her know my plans.

1110 Sampling team finishes sampling MW-1.

1155 Break for lunch.

1230 Samplers prepare to take a sample at MW-13D.

1335 Take sample at 13D.

Purge crew goes to decon. This will be the last sample for today.

1405 After filtering metals sample. Sampling

Susan Collage

(26)

Tutu Wellfield - St. Thomas

10-6-92. Susan Collage
 crew goes to Smith Bay
 to package samples and
 fall out custody forms for
 export to PR.
 1445 Clinton Moffett receives
 a call that VOA samples
 from 4D were no good.
 too much headspace.
 GBM Soil Tech will need
 to resample 4D for
 VOA only.
 This seems to be a problem
 at some wells - it is believed
 that the HCL causes the
 oxygen to come out of
 solution. it appears to
 be like effervescence. (???)
 1520 Leave Site

Susan Collage

(27)

Tutu Wellfields - St. Thomas

10-6-92 - Susan Collage
 0650 Arrive Smith Bay.
 GBM/Soil Tech samples
 preparing to take remainder
 of samples.
 0730 Arrive Esso staging
 area.
 0810 Call Jonathan Rude - Region
 II SMO to let him
 know I've sent revised
 Traffic Reports for 9/29/92
 for shipment.
 Call Donald Bessy at
 CDM Feb Boston. Call Sally
 0930 Collect sample (resample)
 at MW-4D
 0950 Range crew still
 working on MW9 and
 95.
 1105 Sample MW9.
 1150 Sample MW95. Sample crew
 and decon crew clean up site
 1345 - Package samples - Smith Bay
 1510 - Finish Leave Site
 (NOTE) GBM collected 2 full parameters of
 tap water from Esso tap for rec. of Lydia
 Galizia QA for GBM.
 Susan Collage

(28) Tutu Wellfields - St. Thomas 10-7-92
Materials Inventory

Documents:

- Shift on 1- GBM Health and Safety Plan (9/91)
1- GBM WALK Plan (3/92)
2- GBM Quality Assurance Plans (3/92)
1- CDM Fed Revised Brochure (5/92)
4- CDM Fed Site Health and Safety Plan (10/91)

Sampling Paperwork:

- ~ 200 Region II Sample Tags
~ 70 International Airbells
10- Inorgan TR's
18- SAS TR's
11- Organic TR's
3- ESD Field Data Sheets
1- Set of Paper work instructions: includes
examples of ESD field data sheets plus plus
instructions for shipment to ESD lab;
RAS and SAS TR's; Notification of sample
shipment to SMO.
6- Inorganic Sample Numbers
7- Organic sample numbers
Equipment
1- Large Coleman cooler
60- Labels + Custody Seals
1- 80 oz. Amber jug

Susan Collins

Tutu Wellfields - St. Thomas - 10-7-92
Materials Inventory (cont.) (29)

- 4- 1 Liter Amber bottles
50- 40 mL VOA vials
1.5 - Rolls Duct Tape
9- Acid droppers
1/1 - Box (12) poly eth. bottles (1L)
2/3 Box latex gloves
~ 8 Pairs North neoprene overgloves
5 Tyvek
~ 50 pH indicator strips (0-14)
~ 400 mL 10% HNO₃ } GBM field
~ 400 mL conc HCl } office

Susan Collins

Susan Collins

(30)

Well No	Water Volume Information				
	(Ft) Depth to Bottom	(Ft) Depth to Water	(Ft) Water Column	(Inches) Casing Diameter	Date
MW-1	43.30	28.60	14.70	4	10.2.92
MW-1D	90.00	29.62	60.38	6	10.2.92
MW-2	26.90	12.64	14.26	4	9.30.92
MW-3	30.40	16.32	14.08	4	9.30.92
MW-4	27.00	10.62	16.38	4	9.30.92
MW-4D	71.00	11.10	59.90	6	10.5.92
MW-5	39.00	22.60	16.40	4	10.1.92
MW-6R	22.95	7.50	15.45	4	9.29.92
MW-6D	62.60	7.20	55.40	6"	9.30.92
MW-7	35.00	16.76	18.24	4	10.5.92
MW-8	25.56	17.03	8.53	4	9.29.92
MW-9	34.10	12.40	21.70	4	10.7.92
	74.30	20.00	54.30	6	10.2.92
MW-10	35.60	20.52	14.98	4	10.6.92
MW-10D	75.00	20.66	54.34	6	10.6.92
MW-11D	74.30	20.00	54.30	6	10.2.92
MW-12D	80.65	27.82	52.83	4	10.5.92
MW-13D	119.00	83.20	35.80	6	10.6.92
MW-14	45.50	22.80	22.70	4	10.1.92
MW-9S	18.67	12.84	5.83	4	10.7.92

All measurements taken from Top of Casing

Resample

MW-4D	71.00	11.08	59.92	6	10.7.92
MW-1	43.0	28.79	14.21	4	10.6.92

Sum Casing

Water Descriptions

(31)

Excavation Method	Color	Odor	Gallons per foot	Gallons in Well	Total Gallons Pump
Submersible	clear	none	0.65	9.55	30
Submersible	clear	none	1.47	88.75	120 (Dry)
Centrifugal	clear	none	0.65	9.26	37
Centrifugal	clear	none	0.65	9.15	30
Centrifugal	clear	none	0.65	10.65	38
Centrifugal	clear	none	1.47	88.05	264
Centrifugal	clear	Strong odor	0.65	10.66	33
Centrifugal	clear	none	0.65	10.04	37
Centrifugal	clear	none	1.47	81.43	244
Centrifugal	clear	none	0.65	3.79	22
Centrifugal	clear	none	0.65	5.54	12 (Dry)
Submersible	clear	slight odor	0.65	14.10	46
Submersible	cloudy	none	0.65	9.74	33
Submersible	clear	none	1.47	79.87	250
Submersible	clear	none	1.47	88.00	280
Submersible	clear	none	0.65	34.33	123
Submersible	clear	none	1.47	52.62	115
Submersible	clear	none	0.65	14.75	45
Centrifugal	clear	slight odor	0.65	3.79	22

Submersible	clear	none	1.47	88.08	264
Submersible	clear	none	0.65	9.23	28

Sum Casing

(32)

Tata Wellfield, St. Thomas US V3

Purge Data

Well No.	Purge Interval	pH	T (°C)	SP COND (µmhos)	PID (ppm)
MW-1	1	6.85	30.4	1268	0
	2	7.00	30.4	1305	0
	3	7.01	28.9	1301	0
	After Sampling	6.84	29.6	1290	0

MW-1D	1	10.56	29.5	2780	0
	2 DRY	2.06	29.3	741	0
	3 DRY				
	After Sampling				

MW-2	1	6.86	30.1	1321	0
	2	6.98	29.8	1317	0
	3	6.96	30.6	1314	0
	After Sampling	6.85	30.7	1293	0

MW-3	1	6.79	30.6	1233	2.6
	2	6.80	29.8	1241	2.8
	3	6.83	30.1	1252	2.2
	After Sampling	6.74	30.1	1495	2.9

MW-4	1	6.94	33.1	1371	2.76
	2	7.01	32.8	1340	1.0
	3	7.03	32.7	1358	2.40
	sample capture	7.09	31.9	1456	0

Susan Collopy

Tata Wellfield, St. Thomas U.S. V4

Purge Data

(33)

Well No.	Purge Interval	pH	T (°C)	SP COND	PID (ppm)
MW-4D	1	7.00	30.8	1471	0
	2	7.00	30.0	1472	90.7
	3	7.00	30.5	1476	52
	After Sampling	7.00	30.5	1473	68.8

MW-5	1	6.80	29.60	1294	7999
	2	7.00	29.60	1284	2000
	3	7.00	30.02	1262	2000
	After Sampling	7.00	29.20	1149	2000R

MW-6R	1	6.88	31.2	1283	99
	2	6.83	30.2	1309	0
	3	6.79	29.7	1316	0
	After Sampling				

MW-6D	1	6.50	29.4	1450	0
	2	6.70	29.8	1465	0
	3	6.78	29.9	1465	0
	After Sampling	7.74	31.8	1200	0

MW-7	1	7.05	30.3	1294	0
	2	7.05	29.5	1288	0
	3	7.12	29.5	1292	0
	After Sampling	7.05		1289	0

Susan Collopy

Tutu Walefields - St. Thomas U.S.V.I

(34)

Purge Data

Well No.	Purge Interval	pH	T(°C)	COND (µmhos)	PID (ppm)
MW-8	1	6.78	32.8	1252	0
	2	6.88	32.2	1370	0
	3	DRY			
	After Sampling	none	taken		

MW-9B	1	7.13	32.6	1250	600
	2	7.15	32.4	1325	696
	3	7.11	32.0	1322	520
	After Sampling				

MW-10	1	7.23	31.0	469	0
	2	7.18	31.4	1225	0
	3	7.15	31.5	1229	0
	After Sampling	7.05	31.1	1229	0

MW10D	1	7.10	29.3	606	0
	2	7.49	30.1	1106	0
	3/4	7.23/29.5	29.5	1267	0
	After Sampling	7.22	29.6	1266	0

MW11D	1	6.78	29.2	1438	0
	2	7.00	29.4	1556	0
	3	7.00	29.3	1589	0
	After Sampling	9.36	29.9	192	0

Joan Callaghan

Tutu Walefields - St. Thomas U.S.V.I

Purge Data

(35)

Well No.	Purge Interval	pH	T(°C)	COND (µmhos)	PID (ppm)
MW12D	1	7.23	31.1	1459	0
	2	7.50	31.7	1453	0
	3	7.07	31.1	1458	0
	After Sampling	7.28	32.1	1407	0

MW13D	1				
	2				
	3				
	After Sampling	7.05	28.6	2370	0

MW14	1	7.34	31.1	1096	72000
	2	7.14	30.8	1084	0
	3	7.00	30.7	1086	0
	After Sampling	6.54	30.0	1084	0

MW-9	1	7.15	33.2	1386	72000
	2	7.12	29.9	1490	800
	3	7.14	32.2	1486	780
	After Sampling				

[Signature]

[Signature]

36 Tutu Wellfields - St. Thomas USVI
Oil Water Interface

3 Monitoring wells were found to have product in them a fourth - MW-4 had a sheer according to Ruben Ponciano

Well #	(ft) Depth to Product	(ft) Depth to Water	(ft) Product Thickness	Date
MW 9S	13.00	13.11	0.11	9-28-92
MW-4D	11.43	11.44	0.01	9-28-92
MW-5	22.92	22.83	0.01	9-28-92
MW-9S	12.98	13.02	0.04	10-5-92

Susan
Call

10/30/92

37 Tutu Wellfield - St. Thomas USVI

0800 Arrive at site, Sal Tech, and Geraughty + Miller are at the site. After introductions I am informed that schedule will have to be revised due to a political rally that is scheduled immediately adjacent to MW-6R and MW-6D on Fri night, Sunday and probably Tuesday after the election. Also the larger pump needed to complete the step drawdown test on MW-6D was too heavy to bring over on the plane from Puerto Rico so it will not arrive until later this afternoon.

0830 Return to G+M trailer to discuss schedule options with Clinton Moffitt (G+M). After informing Clinton of the concerns, the following schedule is tentatively set.

- Oct. 30 Complete step drawdown on MW-6R (shallow well)
- Nov. 2 Start 24-hr pump test on MW-6R @ 10 am.
- Nov. 3 Complete 24 hr pump test and monitor recovery
- Nov 4 or 5 Complete step drawdown on MW-6D

Brian D. Jones

(38)

10/30/92 Tutu Wellfield St. Thomas USVI

Nov 5 or 6 Begin 72-hr pump test
on MW-6DNov. 9 Complete pump test and monitor
recovery.

900 I have been informed by Clinton Moffitt that pretest water level monitoring seems to indicate that water is being drawn from the aquifer on a regular basis from the Eglon wells. Sharp drops in the hydrograph were reported in MW-1D, MW-11D and MW-12D. The Eglon wells are located south (downgradient) of the two wells (6D and 6D) scheduled for testing.

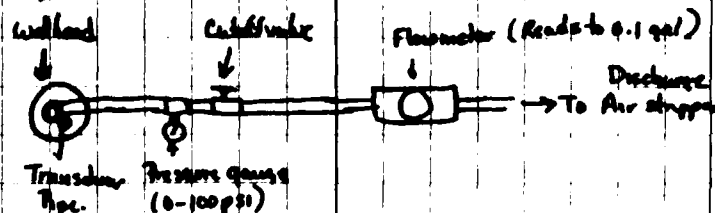
Clinton Moffitt has requested that pumping of those wells be ceased during the pump tests so as to not impact the test results. G+M has agreed to supply water to Eglon during the duration of the pump tests. A copy of the memo will be included in my write-up.

Ruben B. Jones

(39)

10/30/92 Tutu Wellfield St. Thomas

1000 The pump is lowered into the well. Galvanized pipe (1") is used. All threads are wrapped with teflon tape to provide a better seal. The transducer pipe is lowered adjacent to the pump to monitor drawdown. A in-line flowmeter is placed ~ 8 ft from the wellhead in the discharge line. A cutoff valve and pressure gauge/gauge is located ~ 4 ft from the wellhead to regulate flow rate.



11:00 The following is a list of personnel onsite;
 Ruben Ponciano - Geography & Miller
 Clinton Moffitt - G+M
 Anna Gloria Ramos - TEIC Coordinator (ESSD)
 Papo Gonzalez - SoilTech
 Steven Alcea - SoilTech
 Cordona

11:15 Papo Gonzalez is checking water-level meters and setting up dataloggers.

(40)

Tutu Wellfield St. Thomas USVI 10/30/92

11:30 Cordona and Anna ^{Gloria} Ramos are setting data loggers and taking static water level readings. The following wells will be used as observation wells for the step drawdown test on MW-6R;

MW #	Data logger Serial #	Static Water Level (ft)	
MW-5	1048	20.79	11:12 am
MW-6R	1051	5.98	11:42 am
MW-6D	1049	5.79	11:40 am
- 7	18472	15.88	11:24 am
- 8	12332	11.9	11:04 am
- 12D	1050	24.	11:32 am

CHT-4

CHT-6D

Keys were not available so these two wells were not used.

They will be used for the 24 hr test on Monday.

12:10 Begin stepdown test on MW-6R. Pumping rate was adjusted during the first few minutes until a constant rate of 3.5 to 3.25 gallons per minute (gpm). Steady state pumping conditions are achieved after ~ 8 minutes at 6.66 ft below toe. Test was continued for 1 hour before changing pumping rate.

Brian D. Jenks

(41)

10/30/92 Tutu Wellfield St. Thomas USVI

1310 Pumping rate is increased to 6.5 gpm. Steady state conditions are reached after ~ 7 minutes at 9.54 ft below toe after ~ 6 minutes. Pumping at 6.5 gpm is continued to 30 minutes.

1340 Pumping rate is increased to ~ 7.75 gpm immediately after the 30 min. reading. Equilibrium is reached ~ 9 minutes at 9.80 ft below toe, which corresponds to a drawdown of 1.82 ft.

Pumping rate was maintained for 30 minutes.

1410 Pumping rate is increased to 9 gpm.

1424 The back filters at the treatment system clogged which decreased the flow rate to 4.5 gpm. At the time the water level in the pumping well was @ 10.30 ft. The water level increased to ~~7.10~~ 7.10 ft with the filters were changed.

14:38 Pumping @ 9 gpm continues.

Brian D. Jenks

(42)

10/30/92 Tutu Wellfield St. Thomas USVI

14:52 Water level in pumping well has returned to 8.28 ft below toe. which is near the level prior to the pump problems. The pumping test was run for a total of 50 minutes.

1500 Pumping rate is increased to approx. 9.25 gpm which is wide-open on the pump.

The water level in the pumping well had reached equilibrium at 8.50 below toe after 24 minutes which corresponds to a drawdown of 2.52 ft.

1530 Pump is disconnected by Ruben Porciano when he backed up van. Powercord of pump was hooked over the mirror on the van which unplugged it from the power box. Plug was immediately plugged back in. Although pump was stopped for ~ 5 to 10 sec. The water level rose 0.1 ft during this disconnect. Pumping rate of 9.25 gpm was continued thereafter.

(43)

10/30/92 Tutu Wellfield St. Thomas USVI

1600 Pumping test is discontinued with a water level in the pumping well at 8.49 ft below toe which is very close to the level of 8.50 ft prior to the pump disconnect. Recovery of the pumping well was recorded using the same intervals as the drawdown. The intervals were as follows:

Elapsed Time (min)	Frequency
0 - 5	30 sec.
5 - 10	1 min
10 - 30	Every 2 min.
30 - 60	Every 5 min.

1635 Recovery of pumping well was recorded for 35 min. The water level was 8.49 had recovered to 6.00 ft below toe during this period which is 0.02 ft below the static water level of 5.98 ft prior to the onset of the step drawdown test.

1700 Operations are discontinued for the day.

Ruben D. Jenks

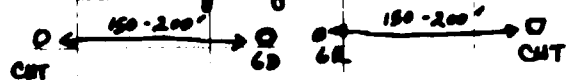
(44)

11/2/92 Tutu Wellfield St. Thomas USVI

0800 Arrive at site, Clinton Moffit is recording water level readings for all observation wells. Ruben Ponciano is setting dataloggers in the following observation wells.

MW	Static WL (OTC)
MW - 6D	5.76
MW - 5	20.66
MW - 7	15.78
MW - 8	11.70
MW - 12D	24.18
MW - 4	9.40
MW - 4D	8.72
MW - 6A	5.92 - Pumping Well

0930 Ruben Ponciano sets the datalogger in MW-6D which is the last well. Two wells which belong to the Four Winds Devel. Group (CWT-4 and CWT-6) will be monitored manually by during the pump test. These two wells (1 upgradient, 1 downgradient) will be the closest wells to the pumping well (~250-200 ft) other than MW-6D which is immediately adjacent to MW-6A.



Brian D. Jenkins

(45)

11/2/92 Tutu Wellfield St. Thomas USVI

1000 The remainder of the crew arrives from Puerto Rico including:

Anna Gloria Ramos - TEIC Coordinator (ES&S)
 Papa Gonzalez } SoilTech
 Steven Alfara }
 Alberto Colberg } Geoghty + Miller
 Wanda Morales }
 Derek McGowan }

The following individuals were onsite:

Clinton Moffit - G+M
 Ruben Ponciano - G+M
 Ken Kanizar - Brigham + Assoc. (CC operator)

1100 SoilTech and G+M began setting discharge pipe and pump. Ruben P. collects a static water level reading from MW-6A prior to setting the pump. G+M sets up a rain gauge adjacent to MW-6A.

1130 Pump is set at a depth of 17.25 ft OTC

1200 - 1300 Break for lunch.

Brian D. Jenkins

(46)

11/2/92 Tutu Wellfield St Thomas, USVI

- 1310 Beginning reading on totalizer meter installed on the discharge line prior to the start of the pump test was 1781.8 gallons.
- 1320 Begin 24 hour pump test. with a pumping rate of 9.3 gpm. Reading intervals are the same as for the slug drawdown test.
- 1500 Pumping continues at ~9.2 gpm. Drawdown for the test ~~is~~ pumping well is ~2.4 ft. and appears to have stabilized for all practical purposes. There has been minimal ^{draw} influences observed in the observation wells (CHT-10). Approximately .06 ft has been recorded so far.
- 1510 Clinton Moffit collects a water sample from the discharge line to check the water parameters of pH, conductivity, and temperature
 pH 7.14
 Cond. 1665
 Temp. 21.4°C
- 1540 Influent and Effluent samples are collected for lab analysis. One more set of samples will be collected near the end of the test.
- Brian D. Jenks

(47)

11/2/92 Tutu Wellfield St. Thomas, USVI

- 1540 Influent/Effluent samples will be collected every 2 hours in between to check the operation of the water treatment system. The samples will be analyzed by Ken Karsner using a portable GC for the following indicator parameters; DTEX, TCE, PCE, trans DCE, cis DCE.
- 1600 Clinton M. collects influent/effluent samples for GC analysis. Also a second sample had been collected to analyze the water parameters (pH, cond, temp) around 1545.
 pH 7.04
 Cond. 1665
 Temp. 20.9°C
- 1730 Pumping test continues at a rate of 9.2 gpm. Clinton Moffit and Albano Colberg will be collecting readings until ~1:00 am at which time Ruben P. and Derek M. will take over until the end of the test. All other personnel have departed since tomorrow is a holiday (Election Day), they will not be onsite.
- 1735 Leave site for the day.

Brian D. Jenks

(48)

11/3/92 Tutu Wellfield St. Thomas USVI

0800 Arrive at the site, Ruben P. and Derek M. are onsite. Very little has changed in the pumping well and observation wells being manually monitored. There has been a little more drawdown in the ^{closest} upgradient observ. well. G+M will not know the entire impact on all wells until the test is completed and the data loggers have been down loaded.

Flow rate continues to be 9.2 gpm
Drawdown (pumping well) = -2.4 ft

0900 Return to SolTech field office to contact CDM-Federal in Oak Ridge and Sally Olland. Ken Karszas is at the field office celebrating the GC to analyze the influent/effluent samples collected during the night.

0930 Called John Young in Oak Ridge and Sally Olland in New York. Sally was not in so I left a message for her to return my call.

Ruben D. Jenks

(49)

11/3/92 Tutu Wellfield St. Thomas USVI

1030 Ken begins running influent/effluent samples. Yesterdays samples detected BTEX, trams and cis DCE, PCE and TCE. Ken completes the first run on the effluent sample from ~ 600 pm last night and finds the sample contaminated with at slightly higher concentrations. He postulates that the levels may continue to increase if the source is upgradient of MW-GR as anticipated.

1100 Sally Olland returns my call. I inform her of the schedule changes and the current status of the test. She asks that I call her tomorrow (11/4/92) after the step drawdown test has been completed on MW-6D.

1220 Leave for lunch at which time a heavy rain shower moves over dropping ~ .10 in. of rain according to the G+M rain gauge.

1320 Pump test stopped and Ruben, Derek, Ollerton, and myself begin monitoring recovery.

Ruben D. Jenks

(50)

11/9/92 TUTU WELLFIELD St. Thomas USVI

1425 Recovery test stopped

1425-1500 Clean-up and breakdown of equipment

1500-1545 Ruben P and Clinton M. pack
samples for shipment to Laboratory (EASCO)

1545 Clinton M. leaves to take samples to FedEx.
Ken K. is completing analysis of QC samples.
The significant finding during the pump test
was that a significant trend of increasing
values of ⁺indicator parameters was observed.
(TCE, PCE, DCE, trans, cis DCE). The effluent
samples were all within cleanup criteria indicating
that the treatment system was working correctly.
Values in the effluent samples also increased
slightly during the course of the test. Treatment
system flow rate may have to be ^{decreased} ~~increased~~ to
lower these levels if they continue to increase.
The fact that the influent values were increasing
would seem to indicate that the source of
contaminants was located north to northeast
of the site.

1615 Leave site for the day

Brian S. Jenkins

(51)

11/9/92 TUTU WELLFIELD St. Thomas USVI

0830 Arrive at site, Ruben Ponciano, Derek McGregor,
and Clinton Moffitt are onsite.

0900 Ruben removes datalogger from MW-6D

1000 SoILTECH crew arrives at site and begins
preparations for water drawdown test by
disconnecting pipe, pump, etc.

1100-1215 Break for lunch

1230 SoILTECH arrives at MW-6D with equipment
to set-up for drawdown test.

1245 Begin setting pump and discharge
line. Static water level 5.71' BTDC
Pump was set at 52.50' BTDC in MW-6D

The following wells will be used as
observation wells.

CHT-6D	}	Manual
CHT-4		
MW-2		
MW-6R	}	Dataloggers
" 5		
" 4		
" 4D		
12D		MW-8 removed

Brian S. Jenkins

(52)

11/4/92

Turn Wellfield St. Thomas USVI

1300 Rain throughout the morning amounted to 0.28 inches

1345 SoilTECH is finishing set-up of pump test
Beginning totalizer reading: 15095.2
Static water level (pumping well) 5.70' BTDC

1402 Begin step drawdown test ^(MW-6D), 1st couple minutes are used to regulate the pumping rate to approx. 9.5 gpm. The drawdown at this rate amounted to 0.22 ft.

1432 Pumping rate changed to 12 gpm.
Equilibrium of water level in pumping well (6D) was reached within a few minutes. Total drawdown was 0.29 ft.

1500 Influent/effluent samples were collected for laboratory analysis and GC screening

1502 Pumping rate increased to approx. 15 gpm. Pumping well stabilized within minutes. Drawdown in the pumping well was 0.39 ft.

Brian D. Janke

(53)

11/4/92

Turn Wellfield St. Thomas USVI

1532 Pumping rate was increased to 17.5 gpm which was wide open for the pump being used. Equilibrium was reached in the pumping well in <10 min. Total drawdown in the pumping well was 0.48 ft. Drawdown in the manually monitored observation wells was minimal. CHT-6D had a water level drop of 0.12 ft. CHT-6D is located upgradient of the pumping well ~200 ft. There did not appear to be any impact on CHT-4 which is located 150-200' downgradient. The data loggers, etc were not downloaded by the end of the day, so the impact on other wells in the vicinity is unknown although it is highly probable that there was no influence other than in MW-6D which is adjacent to the pumping well (6D). The other observation wells were located further from MW-6D than CHT-4 or CHT-6D which would lead to the conclusion that there will probably be no impact.

Brian D. Janke

(54)

11/4/92 Tutu Wellfield St. Thomas USGI

1620 Begin recovery test for skip drawdown on MW-6D. Same time intervals for readings have been used throughout the aquifer testing. (See notes from 10/30/92)

Note: The notes on 10/30/92 fail to mention the reading intervals for the observation wells which are as follows:

Observation Wells

0-5 min	Every 30 sec.
5-15 "	" minute
15-60 min	Every 5 min
60-120 min	Every 10 min
120-480	30 min
480-840	Every 1 hr
> 840	2 hr

These reading ^{time} intervals are consistent with those stated in the G+M workplan.

1650 Stop recovery test. The pumping well has recovered to within 0.05' of static water level. Monitoring of pumping was stopped. One more reading will be

(55)

11/4/92 Tutu Wellfield

collected from observation well CHT-6D at 1720. In the meantime SoilTech begins breaking down the discharge line and pulling the pump.

1700 Ruben P. and Derek M. leave the site to collect the dataloggers so that the data may be downloaded and fresh batteries placed in each of the loggers.

1720 Final water level reading is collected from CHT-6D. Total drawdown in this well had been 0.12' during pumping and it had recovered to within .02' during this recovery period.

1730 Site is secured for the day. The results of today's pumping test (skip drawdown) would seem to indicate that G+M is not going to be able to maintain a pumping rate sufficient to significantly stress the aquifer due to the 15 gpm limitation of the treatment system. Based on these findings it may not

be necessary to run a 72 hr test. This issue will be discussed with Sally Deland and Tom Dandy tomorrow
Ruben D. Jenkins

(56)

11/5/92 TUTU WELLFIELD St Thomas, USVI

0830 Arrive at the site, None of the G+M personnel are at the pump test site (MW-6D) Derek McGregor, Clinton Moffit, and Ruben Porras are the only G+M personnel expected onsite. Ken Kanyar (Bingham Env.) will also be onsite to run the GC analyses on the influent/effluent samples from the treatment system.

0845 Leave the site to go to the SoilTech field office. SoilTech crew has arrived (Papo Gonzalez, Stuen Akora) to ~~reinstall~~ pump and discharge line in preparation for the pump test.

0900 Clinton M. arrives at the field office and informs me that Ruben P. and Derek M. are setting dataloggers in the following monitoring wells.

MW-6R	MW-7
MW-4	MW-12D
MW-5	MW-8
MW-4D	MW-6D (pumping well)

* MW-6D well be set when the pump is installed.

Brian D. Jenks

(57)

11/5/92 TUTU WELLFIELD St Thomas, USVI

0900 In addition to the wells equipped with dataloggers the following wells will be monitored manually using a water-level indicator.

CHT-4	} Caribbean Hydrotech Wells
CHT-6D	
MW-2	MW-10
MW-3	MW-10D
MW-9	MW-11D

0915 Clinton Moffit informed me that he had contacted Tom Danahy (G+M Proj. Mgr) regarding the duration of the pump test on MW-6D given the limited drawdown observed during the step drawdown test (See Field Notes 11/4/92). Tom Danahy stated that the test could be terminated after 24 hr. if steady-state conditions appear to have been achieved. Sally Odland (CDM Federal) and Caroline Kwan (EPA) were in agreement.

1000 Attempt to call Sally Odland but she is not in the office yet. Leave a message for her to return my call at her earliest convenience so that I may return to the field.

Brian D. Jenks

(58)

11/5/92 Tutu Wellfield St Thomas, USVI

1015 Sally Odland returns call. I inform her of the results from yesterday's step drawdown test and the concerns regarding the duration of the test. She ~~also~~ agrees that a 72-hr test will not be necessary given the current circumstances. She asked that the test be run for a minimum of 24 hr since that was the duration specified in the G+M workplan. Sally agrees to contact Tom Danahy and Caroline Kwan in order to reach a consensus decision regarding whether to discontinue the pump test after 24 hr. Tom Danahy will contact Clinton M. with the decision.

1030 Return to the site where G+M and SodTech have just started the pump test on MW-6D and are currently adjusting the pumping rate to achieve a rate of ~14 gpm.

1130 Pump test continues without any problems, pumping rate has been stabilized at 14.2 gpm. Drawdown in the pumping well is 0.12'.

Brian D. Janh

(59)

11/5/92 Tutu Wellfield St Thomas, USVI

1130 Drawdown in the observation wells is as follows;

CHT-6D	0.09'	MW-11D	Up 0.01'
MW-3	None	MW-10	None
MW-2	None	MW-10D	Up 0.04'
MW-9	None	CHT-4	0.04'

Also, a water sample was collected from the discharge line for water quality parameters of pH, conductivity, and temperature.

pH 7.3

Cond 1545

Temp 29.7°C

Additional samples will be collected hourly and analyzed for these parameters throughout the duration of the test.

1230 Continue pumping at 14.2 gpm. Drawdown in the pumping well is still creeping slowly. Drawdown is 0.13'. There has been little change in the observation wells.

Brian D. Janh

(60)

11/5/92 Tutu Waiufiao St Thomas, USVI

1330 Continue pumping at 14.2 gpm. Very little has been recorded in pumping well or observation wells. Clinton M. collects influent and effluent samples for shipment to field base lab (Enasee) for confirmation of GC results. One more set of samples will be collected tomorrow. Five 40 ml. VOA vials were collected for each stream (influent/effluent). Samples are collected directly from the faucets in the discharge lines at the pump and at the treatment system. Collecting samples w/o air bubbles is difficult because of the air in the lines and the pressure with which the water is discharged from the lines. All samples were preserved with HCl to pH < 2 and chilled to 4°C in a sampling cooler prior to shipment. GC samples were also collected at this time. Additional samples will be collected every 2 hours throughout the duration of the test.

Bryan D. Jenks

(61)

11/5/92 Tutu Waiufiao St. Thomas, USVI

1430 Test continues at a pumping rate of 14.2 gpm, little change has been observed.

1630 Test continues, Drawdown in the pumping well is 0.16 ft.

1730 Pumping continues at 14.2 gpm. Drawdown in the pumping well is 0.10 ft. The drawdown in the observation wells is as follows:

CHT-6D	0.12	MW-9	Up 0.02
MW-3	0.02	CHT-4	Up 0.09
MW-2	0.03		
MW-11D	Up 0.07		
MW-10	Up 0.08		
MW-10D	Up 0.09		

The observation wells with rising water levels is associated with the rainfall (0.30 in) yesterday. All of these wells are well downgradient of the expected zone of influence from the pump test given the limited pumping rate.

Bryan D. Jenks

(62)

11/5/92 TUTU WELLFIELD St Thomas, USVI

1745 Clinton Muhlert and Ruben Pinciano are at the site until 10:30 pm at which time Derek McGregor and Steven Alisa will take over. Note that all water quality parameter samples have been collected as well as the GC samples at the scheduled intervals. Results from these samples will be available from G+M therefore they have not been included here. The water quality parameter readings are similar to those reported at 11:30 indicating that major water quality changes have not taken place. Leave site for the day.

Brian D. Jenko

(63)

11/6/92 TUTU WELLFIELD St Thomas, USVI

0830 Arrive at the site. Derek McGregor (G+M) and Steven Alisa (SoilTech) are onsite. No problems had occurred during the night and the test is within 2 hours of completion. Derek stated that they had received 10.61 inches of rain during the night between dawn and dawn. The rainfall recording was per the rain gauge at the site.

0900 Clinton Muhlert arrives at the site.

0915 Anna Gloria Ramos (E&E - TIC) arrives at the site with two SoilTech representatives (Randy + ??)

1000 Influent/Effluent samples are collected for shipment to fixed-base lab. GC sample is also collected at this time.

1030 Pump is shut-off and G+M begins monitoring recovery. Papa Gonzalez begins breaking down equipment in preparation for completion of test.

Brian D. Jenko

(64)

11/6/92 TUTO Wellfield St. Thomas USVI

1210 Test is completed, finished monitoring recovery. Clinton M. states that the dataloggers will be left in place until Monday to further monitor recovery in those observation wells.

1230 SoilTech begins pulling pump and site clean-up. G+M prepares to pack samples for shipment.

1300 Conclusions from pump test on MW-6D.

Drawdown

MW-6D (Pumping well) → 0.22' Max. End of test was @ 0.20'

CHT MW-6D 0.14'

MW-3 0.04' Max.

* By the end of the test the water level had risen to 0.04' above the original static water level. (rainfall)

MW-2 0.08

End of test 0.02 due to rainfall influences

MW-9 Risen 0.10' above static

CHT-4 Risen 0.15' above static

Brian D. Jenks

(65)

11/6/92 TUTO Wellfield St. Thomas USVI

1300 CONCLUSIONS (cont.)

MW-10 Up 0.20' above static

MW-10D Up 0.24'

MW-11D Up 0.48'

Note: The wells which showed negative drawdown (ie. water level rises) are all located well downgradient of the pumping well and beyond the expected zone of influence.

Observed Recovery

MW-6D (Pumping well) 0.41' recovery

CHT MW-6D 0.12'

MW-3 0.04'

MW-11D 0.01'

MW-10 0.01'

MW-10D 0.03'

MW-9 0.02'

CHT-4 0.01'

MW-2 0.02'

Misc

According to Ken Kanizar the concentrations of the indicator parameters were higher in the deep test (MW-6D) than the shallow (MW-6R)

Brian D. Jenks

(66)

11/6/92 TUTU WELLFIELD St. Thomas USVI

During both pump tests the concentrations for all indicator parameters increased with time indicating that the source(s) may be upgradient of MW-6R and MW-6D.

The indicator parameters for these tests

were BTEX, TCE, PCE, trans + cis-DCE

Other peaks were detected on the GC indicating that other contaminants are present which the GC was ~~not~~ not calibrated.

the GC

1300 Leave the site for the day.

(67)