GZA GeoEnvironmental, Inc.

Engineers and Scientists 1 <u>2011 - 2011 - 2011</u>

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Re: Remedial Action Plan

Dover Public Works Facility Dover, New Hampshire

Dear Bob:

On behalf of the New Hampshire Office of State Planning and City of Dover, GZA GeoEnvironmental, Inc. (GZA) is pleased to provide the attached Remedial Action Plan for the above-referenced Site. This report was completed as part of the Coastal Piscataqua River Watershed Brownfields Assessment Demonstration Pilot Project.

GZA looks forward to continuing to work with you on this very important project.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

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NJN/SRL:sjh
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Enclosure

cc: McLaughlin; OSP

Peschel; City of Dover

Jennings; EPA

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#### EXECUTIVE SUMMARY



GZA GeoEnvironmental, Inc. (GZA) has prepared this Brownfields Remedial Action Plan (RAP) for the New Hampshire Office of State Planning (OSP) and City of Dover (City) under the Coastal Piscataqua River Watershed Brownfields Assessment Demonstration Pilot Project. The objectives of this study were to address several unknowns concerning site contamination, investigate environmental data gaps identified from reviewing the previous site studies, and to assist in Brownfields redevelopment strategy. This report summarizes important site environmental information for the use of parties who are interested in its development, provides GZA's assessment of current (non-petroleum related) site environmental conditions, and presents environmental and regulatory issues affecting site redevelopment. GZA particularly focused on areas of buried waste, surficial soil quality, and groundwater quality data gaps. This RAP does not address petroleum issues identified in connection with underground storage tanks (USTs), because these issues are being managed under the New Hampshire Petroleum Funds. Furthermore, aboveground issues such as building materials containing or suspected to contain asbestos or other hazardous materials, as well as piled/stored materials, were not part of this study.

GZA's findings/recommendations with regard to site issues are summarized as follows:

- The site is currently used by the City's Department of Public Works (DPW) for vehicle storage and maintenance, materials storage (road salt, sand and gravel, Jersey Barriers, and so forth), and engineering offices; and is also occupied by an active sewer pump station, recycling center, and recently closed waste water treatment plant (WWTP). School buses were also maintained and parked at the site until recently. Buildings at the site currently include a DPW office and attached storage/vehicle maintenance facility, DPW garage (a.k.a., former school bus garage), pump station, three-sided salt storage shed, and metal storage building.
- Historic industrial uses of the site include soap manufacturing, a velvet mill, a coal shed, stone crushing, refuse incineration, and solid waste disposal.
- DPW and WWTP personnel reported in 1991 "that sludge from septage haul trucks is sometimes discharged into a shallow 10' x 12' pit with wooden retaining walls at the east end of the WWTF storage area in the vicinity of monitoring well MW-4. The frequency of this activity was not known." This practice reportedly ceased in 1991.
- Others identified at least seven culverts under the Site that discharge to the Cocheco River. In addition, floor drains reportedly existed in the DPW building and former school bus garage, and discharged directly to the Cocheco River. The floor drains in the DPW building were redirected to the WWTP in 1999, and the floor drains in the garage were closed in 1996. The culvert reportedly directs stream flow to the Cocheco River.

GZA performed a number of subsurface exploration programs at the site between December 1999 and April 2000 to supplement work performed for the City at the site by others. These recent explorations included 34 test pit explorations, three test borings with monitoring well installations, soil and groundwater sampling at the new monitoring wells and several of the test pits, groundwater sampling at select pre-existing monitoring wells, and

surficial soil sampling. Laboratory analytical testing was performed for volatile organic compounds (VOCs), semi-VOCs, metals, polynuclear aromatic hydrocarbons (PAHs), and/or herbicides and pesticides (one sample only). The following is a brief summary of groundwater level and analytical laboratory results:

- Depth to groundwater level measurements in December 1999 and April 2000 ranged from about 3.7 feet (April 21, 2000) at monitoring well GZ-3, which is located in the former quarry area, to 15 feet (December 20, 1999) at test pit TP-1, which is located within the upper municipal solid waste landfill.
- Based on previous and new explorations, at least one-half of the Site consists of significantly altered ground surface topography. The rear, eastern portion consists of a closed municipal landfill. Within the vicinity of the former WWTP there exist buried construction debris and foundations/structures, including six buried clarifiers and a buried sludge thickener, as well as miscellaneous solid waste (e.g., sand, bricks, glass, metal scraps, rags, paper, ash, rubber, and/or wood). The former WWTP storage area, located to the east of the former WWTP, contains similar miscellaneous waste plus tannery waste and catchbasin grit. Buried river dredgings were encountered between the former WWTP and Cocheco River.
- Chromium and lead were detected in several subsurface soil samples at elevated concentrations. Chromium is typically associated with tannery waste, and lead is typically associated with ash. The majority of subsurface soil samples contained two to four PAHs in exceedance of S-1 and/or S-2 standards. In general, the types and relative concentrations of detected PAHs typify coal ash. Mercury was detected at a concentration slightly above its S-1 standard in one soil sample.
- The majority of surficial soil samples contained arsenic in exceedance of S-1 and S-2 standards. The NHDES considers the detect concentrations indicative of background conditions. Low level PAH concentrations were detected in surficial soils, which is likely due to vehicle use and maintenance at the site, as well as possibly aboveground portable storage of waste oil. Only one soil sample, located near the landfill access road, was found to have PAH concentrations in exceedance of S-1 and S-2 standards. No herbicides or pesticides were detected in the one analyzed sample, which was from a former gardening area.
- Arsenic and cadmium were detected in several groundwater samples at concentrations exceeding GW-1 standards. Chromium was detected in only one groundwater sample at a concentration slightly above its GW-1 standard.

On-site solid waste can possibly be left in-place provided it is permitted/registered and/or closed in a manner acceptable to the New Hampshire Department of Environmental Services (NHDES) Solid Waste Management Bureau. Closure may be required, because there is at least some groundwater impact due to the presence of the solid waste. Closure may include capping with soil and/or engineered materials. Prior to site redevelopment, additional explorations will be needed to further characterize the nature and thickness of the material, and to evaluate engineering characteristics, such as compressibility and/or bearing strength. Special



considerations for construction over these materials will include the release of methane gas and settlement due to decomposition of organic materials, and presence of insects and rodents attracted to organic solid waste.

Based on existing subsurface information presented herein, GZA does not recommend removal of soil or buried solid waste prior to site redevelopment. There are no apparent source areas of groundwater contamination or localized "hot spots" separate from tank areas.



Due to detected concentrations of several metals and naphthalene above GW-1 standards and possible closure of on-site solid waste, GZA recommends groundwater quality monitoring in accordance with a Groundwater Management Permit (GMP), pursuant to Env-Wm 1403.12. A GMP is one type of de-facto Activity and Use Restriction (AUR). Solid waste permitting is another type of de-facto AUR. If no solid waste permit is required, then an excavation AUR should be implemented to provide the framework to manage solid waste and contaminated soil and groundwater that may be encountered during excavation activities.

Based on the findings presented in this report, GZA recommends that the City request the NHDES issue a Certificate of Partial Completion for site-wide hazardous waste (non-petroleum) issues. This certificate would be issued following agreement of solid waste permitting/registration and/or closure requirements, GMP modification, and specific AURs, if any, with the NHDES. After on-site petroleum issues have been abated, on-site solid waste issues have been addressed to the satisfaction of the NHDES, and specific AURs, if any, have been implemented. GZA recommends that the City request a comprehensive Certificate of Completion and/or a Certificate of No Further Action.

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#### 1.0 INTRODUCTION



GZA GeoEnvironmental, Inc. (GZA) has prepared this Remedial Action Plan (RAP) for the New Hampshire Office of State Planning (OSP) and City of Dover (City) under the Coastal Piscataqua River Watershed Brownfields Assessment Demonstration Pilot Project. The objectives of this study were to perform environmental studies at the Dover Public Works facility on River Street in Dover, New Hampshire to address several unknowns concerning site contamination, investigate environmental data gaps identified from reviewing the previous site studies, and to assist in Brownfields redevelopment strategy.

At a meeting on February 9, 2000 with the New Hampshire Department of Environmental Services (NHDES) and City, GZA received direction to prepare RAP summarizing environmental data for the site and environmental issues relative to future site redevelopment. This RAP does not address petroleum issues identified in connection with underground storage tanks (USTs); and aboveground issues such as building materials containing or suspected to contain asbestos, and piled/stored materials. This information is intended to provide the basis for NHDES to issue a partial completion statement under the New Hampshire Brownfields Program so that the City can pursue redevelopment. GZA's work is subject to the Limitations included in Appendix A.

GZA's work plan was approved by NHDES and was collaboratively developed with GZA, OSP, the City, and NHDES. In addition, GZA's Brownfields Quality Assurance Project Plan (QAPP) and its amendment were reviewed and approved by the Environmental Protection Agency (EPA). The City has assumed responsibility for addressing tank and associated petroleum issues at the site, and intends to continue seeking reimbursement for its expenses through the New Hampshire Petroleum Funds. Jacques Whitford Company, Inc. of Portsmouth, New Hampshire is currently the City's consultant with respect to petroleum issues in connection with tanks.

#### 2.0 SITE DESCRIPTION

The Dover Public Works property consists of approximately 35 acres located in the downtown area adjacent to the Cocheco River. The Site includes four buildings and more than 2,400 feet of frontage along the river. The site is currently used by the City's Department of Public Works (DPW) for vehicle storage and maintenance, materials storage (road salt, sand and gravel, Jersey Barriers, and so forth), and engineering offices; and is also occupied by an active sewer pump station, recycling center, and recently closed waste water treatment plant (WWTP). School buses were also maintained and parked at the site until recently. Buildings at the site currently include a DPW office and attached storage/vehicle maintenance facility, DPW garage (a.k.a., former school bus garage), pump station, three-sided salt storage shed, and metal storage building. A locus plan is provided as Figure 1. The locations of the existing buildings, former WWTP, and other existing and former site features are shown on the Site Plan, Figure 2.

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A number of USTs and aboveground storage tanks (ASTs) have been removed from the site (TWM, 1996; Dunn 1991). A diesel UST and pump for filling of DPW vehicles is present adjacent to the western exterior wall of the DPW building. Portable ASTs are present within the former WWTP storage area. These ASTs are used in connection with waste oil recycling operations, which occur in an area east of the DPW building. Other materials accepted for recycling include solid materials, such as paper, cardboard, and glass.



#### 3.0 SITE HISTORY

Beginning in the late 1800's, site use changed from agricultural to industrial. Historic industrial uses of the site include soap manufacturing, a velvet mill, a coal shed, stone crushing, and municipal facilities (Dunn, 1991). Soap manufacturing was located across River Street from the existing skate board park¹ The velvet mill was located in the area of the current DPW buildings. The coal shed was located in the area of the former WWTP. Coal was delivered to the site by barge and unloaded at the bend in the river near the northwestern corner of the former WWTP, where there are currently large stone blocks at the river edge². The stone crusher was located in the vicinity of the existing pump station¹.

The area to the east of the WWTP and west of a wet area was used for storage in connection with WWTP operations. The WWTP reportedly³ received waste from an off-site tannery. Leather wastes were encountered in a test boring (MW-6) by others along the bank of the Cocheco in the vicinity of a former pump island, and in a test boring (MW-4) in the former WWTP storage area. The WWTP discharged treated water into the adjacent segment of the Cocheco River. DPW and WWTP personnel reported (Dunn, 1991) "that sludge from septage haul trucks is sometimes discharged into a shallow 10' x 12' pit with wooden retaining walls at the east end of the WWTF storage area in the vicinity of monitoring well MW-4...The frequency of this activity was not known." This practice reportedly ceased in 19914.

A former quarry area is located approximately 400 feet to the southeast of the DPW garage, and has been used for periodic stockpiling of deicing sand and road salt. Waste collection was performed annually near the entrance to the DPW on River Street, and in the vicinity of an existing asphalt-paved recreation park.

A municipal landfill was operated on the east side of the property before 1962, based on viewing of 1944 topographic contours<sup>5</sup> and aerial photographs (see Section 6.2). This information collaborates information provided by others (Dunn, 1991) that landfilling in the eastern portion of the site stopped in the early 1950's. An incinerator building was reportedly constructed in the early 1900's for incineration of refuse. Aerial photographs show the location of the incinerator as approximately shown on Figure 2. Some of the ash was landfilled on site. The incinerator was converted to a salt storage shed prior to razing.

<sup>&</sup>lt;sup>1</sup> 1987 map included in "Phase I Archeological Assessment," by Thomas J. Morgan, dated 1984.

<sup>&</sup>lt;sup>2</sup> Coal shed is depicted in the vicinity of the former WWTP on a 1905 Sanborn map.

<sup>&</sup>lt;sup>3</sup> Interview with Mr. Richard Gadbois, of the Dover Department of Public Works.

<sup>&</sup>lt;sup>4</sup> Telephone correspondence with Mr. Dean Peschel of the City of Dover on August 4, 2000.

<sup>&</sup>lt;sup>5</sup> Topographic contours shown on USGS plan entitled "Dover East, ME.-NH.," dated 1956, photorevised 1973.

An existing environmental report (Dunn, 1991) identified at least seven culverts under the Site that discharge to the Cocheco River. Of these, two were identified as environmental concerns, including a 30-inch concrete culvert that discharges bypass flow from the WWTP, and an abandoned pipeline that served the WWTP as an outfall discharge to the Cocheco River for chlorinated wastewater. In addition, floor drains reportedly existed in the DPW building and former school bus garage, and discharged directly to the Cocheco River. The floor drains in the DPW building were redirected to the WWTP in 1999, and the floor drains in the garage were closed in 1996. The culverts reportedly direct stream flow to the Cocheco River.



#### 4.0 PETROLEUM ISSUES

Petroleum issues related to former USTs and ASTs at the site have been investigated and addressed by others for the City. Remediation of petroleum-contaminated soil and groundwater at the site is on-going. Investigations and remediation were performed by Dunn Geoscience Corporation (Dunn) in 1991 and 1992, Total Waste Management Corporation (TWM) in 1996, and Jacques Whitford Company, Inc. (JWC; f.k.a. CEH-Jacques Whitford) since 1996. The purpose of this section is to summarize, in brief, the results of Site work by others. Refer to the reports in Section 8 for additional information regarding these issues.

The findings of investigations by Dunn (1991 and 1992) indicated two Site areas that had been impacted by historical releases of petroleum product. Dunn installed eight monitoring wells at the Site (designated MW-1 through MW-8), which they sampled in May and September 1991. Groundwater samples collected from wells MW-3 and MW-6 were found to contain elevated concentrations (i.e., above Ambient Groundwater Quality Standard [AGQS]) of VOCs, base/neutral extractable compounds (semi-VOCs) or total petroleum hydrocarbons (TPH). MW-3 was installed in the vicinity of a tank field and pump island located near the southeastern corner of the DPW building. MW-6 was installed in the vicinity of another tank field and pump island near the northwestern corner of the DPW building and on the bank of the Cocheco River. On May 2, 1991, a free product seep from the toe of the Cocheco River bank was observed by Dunn at a point approximately 60 feet north of the latter pump island. Approximate UST locations shown on Figure 2.

To achieve and maintain compliance with the prevailing UST regulations at the time (NHDES Rules Env-Ws 411, Control of Underground Storage Tanks), and in consideration of future plans for the Site, the City contracted TWM to clean and remove eight USTs from five separate areas at the Site. TWM completed the UST closures during the period from December 1995 through January 1996. Based on observations and testing results during the tank closures (TWM, 1996), TWM concluded that there had been petroleum releases at each of the UST locations.

During JWC's site investigations between 1996 and 1999, JWC completed 11 borings in order to assess the magnitude and extent of subsurface soil contamination remaining at each of the former tank areas resulting from TWM's 1996 work. Additionally, JWC installed monitoring

<sup>&</sup>lt;sup>6</sup> Floor drain closure and DPW culvert information was provided by Dean Peschel of the City of Dover on August 4, 2000.



wells in six of the completed borings, replaced several destroyed monitoring wells, and installed well points in the river bottom. The borings without monitoring wells (S-series), new monitoring wells (designated MW-9 through MW-14), replacement wells (MW-3A and MW-8A), and well points (WP-1 and WP-2) are shown on the plan by JWC, entitled "Water Table Map, September 30, 1998" and included in Appendix B. JWC collected groundwater samples from the monitoring wells in 1996 and 1997, as well as collected three surface water samples along the bank of the Cocheco River and in the vicinity of the former adjacent pump island. The laboratory analytical results for soil samples collected during drilling and during these groundwater sampling events are summarized in the tables included in Appendix B. The following table summarizes the identified UST information, and associated soil and groundwater quality standard exceedance information. UST Areas are shown on the JWC figure in Appendix B.

UST: AREA	TANK DESCRIPTIONS	SOIL QUALITY	1996 TO 1998 GROUNDWATER QUALITY
A/B	2 Gasoline USTs	10-12 feet, NH S-1 and S-2 exceeded for benzene and MtBE	At MW-3A, GW-1 exceeded for benzene, naphthalene, and toluene; GW-2 exceeded for xylenes. At MW-12, GW-1 exceeded for benzene, ethylbenzene, naphthalene, and MtBE; and GW-2 exceeded for benzene.
D	1 Waste Oil UST		
E/F/G	2 Gasoline and 1 Diesel UST	5-7 feet, NH S-1 and S-2 exceeded for benzene, ethylbenzene, naphthalene, toluene, and xylenes	At MW-6, GW-1 exceeded for benzene, ethylbenzene, naphthalene, and MtBE. At MW-9, GW-1 exceeded for benzene, and naphthalene. At WP-1, GW-1 exceeded for benzene and MtBE. At WP-2, GW-1 exceeded for benzene and MtBE.
Н	#2 Fuel Oil UST		
J	#2 Fuel Oil UST		At MW-11, GW-1 exceeded for benzene and naphthalene. At MW-13, GW-1 exceeded for Naphthalene.

Note: This information is from JWC's RAP, dated May 3, 1999. For groundwater quality information, the most recent groundwater analytical results are shown. A blank indicates no exceedances.

In their RAP, JWC concluded that the applicable cleanup goals for soil are the NH S-2 standards. They reasoned that the NH S-2 standards are applicable, because:

Current and potential future site use is expected to yield a high adult frequency of use and low frequency of use by children as they pertain to site workers and visitors, respectively. For the construction worker, the intensity of use may be high.

For all but the construction worker, the intensity of use is expected to be low. For the construction worker, the intensity of use may be high.

Contaminated soil is-expected to be located between 5 and 15 feet below ground level. Therefore, it is considered potentially accessible.

They also concluded that the applicable cleanup goals for groundwater are GW-1 standards, although GW-2 would be applicable for the future "establishment of basement domiciles."



JWC estimated that the volume of soil exceeding Cleanup Goals in Tank Area is 110 cubic yards, and in Tank Area E/F/G is 120 cubic yards. JWC concluded that soil excavation and off-site disposal is the most cost-effective option for reaching soil Cleanup Goals. Also in their RAP, JWC selected monitored natural attenuation as the remedial alternative for groundwater at UST Area A/B; and in situ bioremediation as the remedial alternative for groundwater at UST Area E/F/G.

GZA understands that a Groundwater Management Permit (GMP), which was prepared by Jacques Whitford Company, for petroleum issues is currently under review by the NHDES. Excavation of petroleum-containing soils was performed in accordance with a NHDES-approved RAP. During excavation activities, more petroleum-containing soil was encountered than expected, and the NHDES has requested that additional subsurface information be collected prior to continuing remedial measures.

#### 5.0 HISTORIC NON-PETROLEUM ENVIRONMENTAL INFORMATION

#### 5.1 WETLANDS AND ENDANGERED SPECIES

Dunn subcontracted with Natural Resource Consulting Services of Concord, New Hampshire to perform wetland and endangered or threatened species survey. Four wetlands were identified at the site. Dunn indicated that "All of these wetland areas have been disturbed to varying degrees by past site activities." Dunn also reported that "No threatened or endangered species were identified on the site. However, it is possible that short-nosed sturgeon (a protected species) could occur in the Cocheco River adjacent to the Site."

#### 5.2 ASBESTOS-CONTAINING BUILDING MATERIALS

Dunn (1991) performed a preliminary survey to determine the nature, location, and approximate quantity of accessible suspect asbestos-containing material (ACM) and develop an approximate cost range for abatement. Dunn did not, however, investigate ACM around underground piping for outdoor WWTP facilities. ACMs were identified in the DPW office building and WWTP building (razed) and in a white house (razed) adjacent to the DPW office building. In November 1995, Northeast Test Consultants prepared a report entitled "Specification for Asbestos Abatement at Waste Water Treatment Building, River Street, Dover, NH." ACMs were removed by Venture Asbestos Abatement of Salem, New Hampshire in the Spring of 1996.

#### 5.3 BRIEF SUMMARY OF HISTORICAL SOIL AND GROUNDWATER QUALITY-UNRELATED TO STORAGE TANKS

#### 5.3.1 Former WWTP

Dunn perform a single boring (B-1) in the WWTP area in 1991. A soil sample (depth of 9.8 to 10.5 feet) collected from natural silt below the fill was analyzed for total metals including arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver. Barium and chromium were the only compounds detected, and were reported at concentrations of 32 milligrams per kilogram (mg/kg) and 13 mg/kg, respectively. These concentrations are well below current S-1 standards 750 mg/kg, and 130 mg/kg (Chromium VI), respectively. The fill was found to contain ash, rubber, bricks, and coal, and extended to a depth of about 8 feet.

#### 5.3.2 Former WWTP Storage Area

A test boring (MW-4) advanced in the former WWTP storage area encountered leather in fill at depths greater than 12 feet and well below the groundwater table, which was observed at a depth of about 6 feet in April 2000. Groundwater samples collected from MW-4 in May of 1991 contained cadmium (7 ug/L) and lead (1,200 ug/L) at concentrations in exceedance of 1991 Maximum Contaminant Levels and current GW-1 standards (5 ug/L and 15 ug/L, respectively). Cadmium and lead were not detected in a second groundwater sample collected from MW-4 in September of 1991. A composite soil sample from test pits (TP-2, TP-3, TP-4, and TP-7) excavated in 1991 in the same area was analyzed for by EP Toxicity for the metals barium, cadmium, chromium, lead, and mercury. Only barium was detected at the relatively low concentration of 0.57 mg/L. Leather hides mixed with layers of solid waste fill are also noted on the logs for TP-3 and TP-7 below depths of 12 and 8 feet, respectively. The logs note the top of original ground in the former and latter test pits at approximately 14 and 10 feet, respectively.

#### 5.3.3 Municipal Solid Waste Landfill

Dunn performed a single boring (B-2) in the municipal solid waste landfill and adjacent to its access road, as shown on Figure 3. The fill was found to contain ash, cinders, glass, and sand; and extended to a depth of about 15 feet. A soil sample of sandy loam collected from below the fill was analyzed for total metals including arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver. No metals were detected in the sample, except barium (32 mg/kg) and chromium (13 mg/kg) at concentrations below S-1 standards. The sample was also analyzed for VOCs and TPH. No VOCs were detected. TPH (S-1 of 10,000 mg/kg) was detected at the low concentration of 3.6 mg/kg.

#### 5.3.4 Former Recycling Area

Monitoring well MW-1 was installed generally downgradient of the former recycling area and in River Street by Dunn (1991). Groundwater samples collected from this well in May and September 1991 indicated the presence of the chlorinated solvents trichloroethylene (high of 2 mg/L) and cis-1,2-dichloroethylene (high of 2 mg/L) at concentrations below 1991 Maximum Contaminant Levels and current GW-1 standards (5 and 70 mg/L, respectively).



#### 5.3.5 Hill Adjacent to Existing Recycling Area

Granite State Explorations conducted about 15 test borings in this area between 1976 to 1978 as part of geotechnical explorations for expansion of the WWTP. Test boring logs do not indicate the presence of solid waste or other suspect fill. In general, clay or silt was encountered overlying glacial till. The explorations did not penetrate the glacial till.

#### 5.3.6 Southwest Hill Area

Dunn (1992) completed four hand-auger probes in the hill area located in the southwestern corner of the site and northeast of the former recycling area. No solid waste or suspect fill was encountered. One composite sample was analyzed by Toxicity Characteristics Leaching Procedure for arsenic, barium, cadmium, chromium, lead, and mercury. No metals were detected. Dunn reported that "The surface observations, reported site history data and preliminary soil test results from the summit area, suggest that there is a low probability of a significant adverse environmental condition in this area of the Site. Based strictly on the apparent good environmental quality of the summit area, it would be a satisfactory location for a residential land use. It should be noted, however, that other site conditions such as shallow bedrock may make the area less suitable for excavation and construction."

#### 5.3.7 River Bank Adjacent to DPW Buildings

A number of explorations have been conducted between the DPW buildings and river for assessment of petroleum contamination associated with the former tank field. Boring logs for these explorations indicate the presence of miscellaneous solid waste. In particular, material identified as "ash fill, cinders w/ f-c sand (with fine to coarse sand)" is noted on the log for MW-7 in this area.

#### 6.0 CURRENT INVESTIGATIONS

#### 6.1 HISTORIC AERIAL PHOTOGRAPHS AND MAPS REVIEWED BY GZA

Prior to performing subsurface explorations at the site, GZA performed a review of aerial photographs and maps made available by the City and the New Hampshire Department of Transportation, and available in our in-house files. GZA reviewed five photographs, dated 1951, 1962, 1979, 1981, and 1989. GZA also reviewed a topographic map that was based on a November 30, 1967 aerial photograph, and U.S. Geologic Survey (USGS) topographic maps dated 1956 (photo-revised 1973 and 1988). GZA's objective was to assess Site areas with the greater potential for landfilling and subsurface contamination.

Review of the photographs and maps suggest that the municipal landfill was in operation after 1944<sup>7</sup> and before 1962. The 1951 photograph showed filling operations in the landfill area in progress. Photographs dated 1962 and later show disturbance of the landfill area, which was probably due to covering and grading operations. The 1979 photograph shows the incinerator, while the 1989 photograph clearly does not show it.

<sup>&</sup>lt;sup>7</sup> The ground surface topography on the 1956 USGS maps were based on planetable surveys in 1944.

The northern limit of the municipal landfill, as depicted on Figure 3, is based on the comparison of existing (Figure 2) and 1944 topographic contours, which shows a ravine within the central and northern portion of the existing landfill area. The western and southern limits were approximated based on observation of existing site features, and test pits performed during the current study. On the 1956 USGS plan, the landfill access road appears to head towards and terminates in the area of the pre-existing ravine.



The 1962 photograph shows the WWTP with its fenceline, of which existing remnants are similarly located. The area of the WWTP appeared covered with brush and traversed by apparent vehicle tracks in the 1951 photograph. None of the photographs reviewed clearly showed filling operations in progress within the former WWTP area or its storage area.

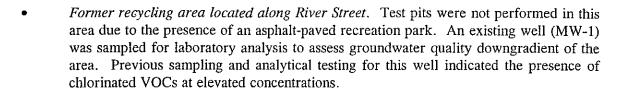
The 1956 USGS plan shows the access road to the municipal landfill continuing over a bridge to the western bank of the Cocheco River. Five buildings are shown on the 1956 plan, including four at the northeastern corner of the intersection of River Street and the landfill access road, and one at the northern corner and adjacent to the Cocheco River. These five buildings do not appear in later photographs.

#### **6.2 SUBSURFACE EXPLORATIONS**

The tasks performed by GZA during this study were developed collaboratively between GZA, NHDES, the City, and OSP to address non-petroleum related environmental issues at the site. GZA particularly focused on areas of buried waste, surficial soil quality, and groundwater quality data gaps. While GZA performed several investigations to assess the southwestern limits of municipal solid waste landfill, GZA did not perform explorations within municipal landfill areas identified by photographs and maps, as agreed upon by the parties mentioned above, because the City indicated that future development on the landfill would not be part of their Brownfields initiatives. GZA also did not perform investigations in the southwestern hill area, which Dunn concluded was apparently of "good environmental quality." GZA's tasks are outlined in our Scope of Work dated November 22, 1999, and its addendum dated February 22, 2000. Data collection activities generally followed the procedure in the QAPP prepared by GZA dated November 1999; revised December 10, 1999; and amended March 15, 1999.

A number of subsurface exploration programs were performed at the site between December 1999 and April 2000 to supplement work performed for the City at the site by others. The approximate locations of the explorations are shown on Figure 3. These recent explorations included 34 test pit explorations that were completed at the site by the Dover DPW. TP-series test pits were excavated in December 1999, and TP2-series test pits were excavated in April 2000. Moreover, three test borings (designated GZ-1, GZ-2 and GZ-3) with monitoring well installations were completed at the site by New Hampshire Boring, Inc. of Londonderry, New Hampshire in April 2000. Soil and groundwater samples collected from these test pits and monitoring wells, as well as from pre-existing monitoring wells, were analyzed for VOCs, semi-VOCs (or subset of polynuclear aromatic hydrocarbons [PAHs], and/or the eight Resource Conservation and Recovery Act (RCRA) metals. GZA also collected 11 surficial soil samples for laboratory analysis.

GZA's selection of test pit and test boring areas was based on our understanding of site history, and field observations as summarized below.





- Former incinerator area and access road to municipal landfill. Five test pits (TP-1, TP-2, TP-3, TP-16, and TP-17) were conducted in this area to assess the nature and northern extent of buried waste and/or ash.
- Existing recycling area. Two test pits (TP-4 and TP-5) were performed in this area to assess environmental impact due to recycling operations or former historical use in vicinity of razed structures. An existing monitoring well (MW-14) was sampled for laboratory analysis to assess groundwater quality relative to recycling operations, as well as the migration of possible groundwater contamination from the upgradient municipal landfill.
- Former WWTP Storage Area. Includes buried waste and former sludge dewatering pit adjacent to wetland. Seven test pits (TP-10 through TP-13, and TP2-1 through TP2-3) and one test boring/monitoring well (GZ-1) were performed in this area to further determine the extent of the waste, and to collect soil and groundwater samples for laboratory analysis. A test pit was not conducted in the former sludge dewatering pit, which was identified on a plan by Dunn (1992), based on the materials encountered in test pits (TP-10 and TP2-1) conducted in this area. Access to the general vicinity of the former sludge dewatering pit was limited due to the presence of obstructions, such as large concrete blocks and other surficial debris. The monitoring well MW-4, which was installed by Dunn in this area, was not observed by GZA.
- Former waste water treatment facility area. Includes adjacent bank of Cocheco River. A total of 20 test pits and one test boring/monitoring well (GZ-2) were completed in this area to assess nature and extent of buried materials, and to collect soil and groundwater samples for analytical testing. One test pit (TP-9) was performed in area identified as the former sludge thickener.
- Former quarry area. One test boring/monitoring well (GZ-3) was performed in this area for groundwater quality assessment, including possible groundwater contamination from the upgradient municipal landfill.
- Hill between site buildings and former prison. Due to historic subsurface information in this area (i.e., logs by Granite State Explorations) indicating no significant environmental issues and inaccessibility at time of test pit explorations, no subsurface explorations were performed in this area. GZA did, however, collect two surface soil samples (TP-19 and SS-10) for laboratory analysis.

In general, the test pit excavations were advanced to the approximate groundwater table encountered during the excavations, and test borings were advanced to approximately 5 feet below the water table for the installation of monitoring wells. Test borings were advanced using standard hollow-stem auger drilling techniques without the use of water. Soil samples were obtained from test pits by first using an excavator to scrape the pit sidewall and to form a

mini-stockpile, which was then sampled for containerization using a precleaned trowel. Groundwater samples were collected from test pits by dipping the sample container directly into the water. Groundwater samples from test pits collected for metals analysis were subsequently field filtered and recontainerized in a pre-preserved container. Soil samples were collected at test borings continuously with a split-spoon sampler.



Groundwater samples were collected from eight existing monitoring wells and from the three new wells for analysis of VOCs, semi-VOCs (or subset of PAHs), and/or the eight RCRA metals. Existing monitoring wells were chosen for sampling to supplement the results of previous sampling rounds by others, and to fill data gaps with respect to non-petroleum environmental issues. New monitoring wells were installed and sampled for the objectives identified above.

GZA also collected surficial soil samples from across the site for analysis of herbicides and pesticides<sup>8</sup> (TP-19 only); and the eight RCRA metals and/or PAHs (SS-1 through SS-10). The sampling locations were intended to be random, with the exception of TP-19, which was located in a suspect former gardening area<sup>9</sup>. The objective of the random sampling was to assess the quality of surficial soils in consideration of future site planning and development. Surficial soil samples were collected with a pre-cleaned trowel to depths of about 5 to 12 inches below ground surface, as indicated on Table C-1 in Appendix C, and composited in the field prior to containerization for the lab.

Soil samples from test pits and test borings were screened in the field for VOCs with a TEI model 580B photoionization detector (PID). Test pit and test boring/monitoring well installations logs prepared by GZA are included in Appendix C, together with a table summarizing soil and groundwater analytical testing and a table summarizing collection and description of surficial soil samples. All laboratory analytical testing was performed by Eastern Analytical, Inc. as described in the QAPP, except as otherwise noted herein. Additional information about soil and groundwater sampling, laboratory testing techniques, and quality assurance can be found in the QAPP.

#### **GEOLOGY**

Based on previous test borings performed by Granite State Explorations from 1976 to 1978, Dunn and JWC from 1991 to 1997, and recent explorations by GZA, the site stratigraphy generally consists of fill overlying natural sand, clay, till, and bedrock. Descriptions of the geologic units encountered are as follows, in general order of occurrence below ground surface:

• <u>Fill:</u> Fill has been encountered across much of the site, with the exception of the relatively undisturbed sloped area (elevations above about 30 feet, NGVD) located east of the DPW garage, within the former quarry area, and within the southwest hill area. The fill consists predominantly of miscellaneous solid waste and construction debris, with areas having layers or pockets of catchbasin grit, river dredgings, and tannery

<sup>&</sup>lt;sup>8</sup> The analysis for herbicides was performed by Environmental Science Corporation of Middletown, Connecticut by EPA Method 8151A, and or pesticides by Eastern Analytical, Inc. of Concord, New Hampshire by EPA Methods 8081A/8082.

<sup>&</sup>lt;sup>9</sup> Based on review of aerial photographs.

waste, as generally described below. The approximate limits of areas containing these materials are shown on Figure 3. The thickness of the fill commonly ranged from approximately 5 to 15 feet in thickness, and was moderately stiff requiring medium excavation effort.

Miscellaneous solid waste is generally described as sand with varying amounts of bricks, glass, metal scraps, rags, paper, ash and/or cinders, rubber, concrete, and/or wood.

Construction debris was generally described as a mix of sand, brick, wood, concrete, tarps, shingles, asphalt, boulders, and/or blasted rock.

Catchbasin grit consists of materials removed from City catchbasins, and is generally described as black or gray sand with silt or clay. It was encountered mixed with gravel and/or cobbles. The catchbasin grit has a distinctive sewage-type odor.

River dredgings is generally described as black or gray, loose sand or soft silt and/or clay with organic material (e.g., organic silt, leaves, twigs, logs). River dredgings were commonly associated with solid waste fill and/or tannery wastes.

Tannery waste was generally described as leather cuttings or hides mixed with sand. The tannery waste was encountered as layers or pockets within construction debris, miscellaneous solid waste fill, and/or river dredgings. Tannery waste was encountered within numerous explorations in the former WWTP storage area. The approximate limits of the waste within the latter area based on previous and recent explorations are shown on Figure 3. Tannery waste was encountered at all depths within the fill.

Municipal solid waste landfill was explored with four test pits (TP-1, TP-2, TP-3 and TP-16). Material encountered in these test pits consisted of layers and pockets of miscellaneous solid waste, construction debris, tannery waste, and river dredgings.

- <u>Sand</u> Naturally occurring fluvial sand generally consists of brown or gray, fine to medium sand. In some explorations, the sand deposit contained gravel. Where encountered, the sand stratum ranged between five and forty feet or more below ground surface.
- <u>Clay and Silt</u> Naturally occurring fluvial clay and silt deposits were generally
  encountered along the northern portion of the site approximately 4 to 40 feet below
  ground surface.
- Glacial Till Glacial till was encountered near ground surface to 23.5 feet below ground surface on the hill to the east of the recycling center. The glacial till is generally described on logs by Granite State Explorations as "grayish brown, compact, gravelly, silty, sand."
- <u>Bedrock</u> Refusal on probable bedrock was encountered at shallow depths (*i.e.*, less than 10 feet) in the vicinity of the former quarry (GZ-3, refusal at 8 feet), behind the DPW maintenance garage (TP-18, refusal at 8 feet), and along the access road to the



municipal solid waste landfill (TP-16, refusal at 7 feet). Shallow bedrock is anticipated in the southwest hill area.

Bedrock outcrops along River Street and behind the DPW garage belong to the Kittery Formation. The Kittery Formation is generally described as gray, brownish-gray, or dark green, fine-grained, banded impure quartzite that is often interbedded with slate, phyllite, or fine-grained schist (Novotny, 1969).

Deeper bedrock occurs nearer the Cocheco River. Depth to drilling refusal at boring A-21, located in the former WWTP storage area, was about 40 feet. Boring MW-12, located in the area of existing pump island, was terminated with refusal on possible bedrock at a depth of 17 feet. Previous explorations on the hill adjacent to the recycling area were not extended through the glacial till to bedrock. Based upon our review of the existing information, there have been no bedrock cores collected during drilling.

#### **GROUNDWATER**

Depth to groundwater level measurements in December 1999 and April 2000 ranged from about 3.7 feet (April 21, 2000) at monitoring well GZ-3, which is located in the former quarry area, to 15 feet (December 20, 1999) at test pit TP-1, which is located within the upper municipal solid waste landfill. Depth to water measurements in GZ-1 and GZ-2 (April 21, 2000), located in the former WWTP and adjacent storage area, were 6.0 and 9.6 feet, respectively.

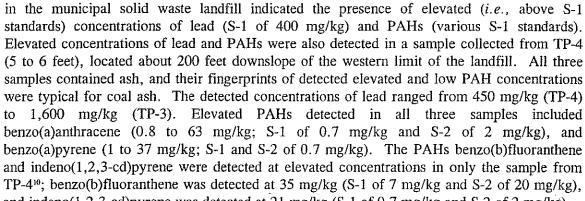
Based on groundwater elevation contours developed by CEH (1997) for measurements obtained on June 4, 1997, groundwater flow at the site and in the vicinity of the existing buildings is directed towards the Cocheco River. In the western portion of the site, groundwater flows towards the west and in the northern portion of the site, groundwater flows towards the north. No groundwater elevation data is available for the eastern and southern portions of the site.

CEH-Jacques Whitford completed a tidal effect evaluation over a period of three days in 1997 at five on-site monitoring wells. CEH-Jacques Whitford concluded that "Although tidal variations in the Cocheco River were measured at about 8 feet (from high to low tide,...), effects on water levels in the site monitoring wells was minor....MW-9 and MW-6, located on the bank adjacent to the river, recorded only about 0.5 feet and 0.2 feet, respectively of tidally influenced water level change."

#### 6.3 LABORATORY ANALYTICAL RESULTS FOR SUBSURFACE SOIL SAMPLES

A table summarizing laboratory analytical results for subsurface soil samples collected from test pits is provided in Table 1. Laboratory testing was not performed for samples collected from test borings, because the soil encountered in the test borings was similar to that encountered in nearby test pits for which sampling and analytical testing had been performed. The analytical results reported for subsurface soil samples are compared with S-1 and S-2 standards provided in the NHDES Risk Characterization and Management Policy (RCMP, 1998). The S-1 standards are most restrictive and should be applied for most intensive and frequent site use (e.g., residential). The S-2 standards are somewhat less restrictive, and may be applicable depending on soil accessibility, and intensity and frequency of site use.





Laboratory analytical results for samples (TP-2, 5 to 7 feet and TP-3, 11 to 11.5 feet) collected

other metals detected at somewhat high concentrations in soil samples included chromium (S-1" for Cr VI of 130 mg/kg) and mercury (S-1" of 1 mg/kg). Chromium was detected in three soil samples (TP-10, TP-12, and TP-14) from the former WWTP and adjacent fill areas at concentrations ranging from 240 mg/kg (TP-10, 6 to 7 feet) to 1800 (TP-12, 4 to 5 feet) mg/kg. Mercury was detected in one soil sample above its S-1 standard of 1 mg/kg; namely, 1.2 mg/kg in the sample from TP-14 (7 to 9 feet), which is located in the former WWTP area.

Elevated PAHs were also detected in three samples collected from locations across the site, including test pits TP-5 (vicinity of the former A/B/C tank field and a former building), TP-6 and TP2-16 (northwest of the former WWTP), and TP-10 (area of filled wetland). Test pit TP-5 was terminated with refusal at a depth of 6 feet on an apparent foundation covered with a thin layer of oily soil. The sample from TP-5 (5.5 to 6 feet), which consisted of the oily soil, was found to contain 8.7 mg/kg of naphthalene (S-1 and S-2 of 5 mg/kg), 1.6 mg/kg of benzo(a)anthracene (S-1 of 0.7 mg/kg and S-2 of 2 mg/kg), 1.7 mg/kg of benzo(a)pyrene (S-1 and S-2 of 0.7 mg.kg), and 0.8 mg/kg of indeno(1,2,3-cd)pyrene (S-1 of 0.7 mg/kg and S-2 of 2 mg/kg). The sample from TP-5 also contained alkylbenzenes at concentrations greater than the S-1 and S-2 standard (59 mg/kg). The soil sample from TP2-16 (3 to 5 feet) contained solid waste fill with leather clippings, and also appeared to contain oil. The TP2-16 sample contained 0.8 mg/kg of benzo(a)anthracene (S-1 of 0.7 mg/kg and S-2 of 2 mg/kg). The soil sample from TP-10 (6 to 7 feet) consisted of asphalt cuttings, and was found to contain four PAHs at concentrations above S-1 standards, including 12 mg/kg of benzo(a)anthracene, 9.4 mg/kg of benzo(b)fluoranthene (S-1 of 7 mg/kg and S-2 of 20 mg/kg), 10 mg/kg of benzo(a)pyrene, and 4.7 mg/kg of indeno(1,2,3-cd)pyrene. All three samples from TP-5, TP2-16, and TP-10 contained low concentrations of a number of other PAHs typical for petroleum products.

<sup>&</sup>lt;sup>10</sup> Duplicate sample contained 24 mg/kg of benzo(b)fluornathene, and 8 mg/kg of indeno (1,2,3-cd)pyrene. Note that duplicate sample also contained elevated concentration of dibenz(a,h)anthracene at its detection limit of 3 mg/kg, although it was not detected in the original sample.

<sup>&</sup>lt;sup>11</sup> The S-1 standard for Chromium III is 1,000 mg/kg. Note that since the S-1 standards for chromium are specific to Cr VI and Cr III, these standards do not strictly apply to the samples, which were analyzed for total chromium.

<sup>12</sup> The S-1 standard is for inorganic mercury.

The soil sample from -TP-6 (4 to 5 feet) consisted of sand with pockets of river dredgings and construction debris, and was found to contain 21 mg/kg of benzo(a)anthracene (S-1 of 0.7 mg/kg and S-2 of 2 mg/kg), and 9 mg/kg of benzo(a)pyrene (S-1 and S-2 of 0.7 mg.kg). Other PAHs detected at low concentrations in this sample had a fingerprint typifying coal ash.

#### 6.4 LABORATORY ANALYTICAL RESULTS FOR SURFICIAL SOIL SAMPLES



Table 1 summarizes laboratory analytical results for surficial soil samples. The analytical results reported for surficial soil samples are also compared with S-1 and S-2 standards.

GZA analyzed all of the surficial soil samples, except TP-19, for the eight RCRA metals. GZA did not detect the presence of metals in surficial soil samples above S-1 standards, with the exception of arsenic (S-1 and S-2 of 12 mg/kg) which was detected at concentrations ranging from 13 to 25 mg/kg in nine of the 11 samples analyzed for the eight RCRA metals. The highest concentration (25 mg/kg) was detected in the sample SS-10 collected from the suspect former garden area on the hill adjacent to the DPW garage. It is GZA's experience that background concentrations of arsenic in New Hampshire have been found within this range, and may be associated with agriculture.

GZA analyzed five surficial soil samples (SS-1, SS-4, SS-5, SS-6, and SS-7) for PAHs. Low level PAHs were detected in all of the samples. Benzo(a)anthracene and Benzo(a)pyrene were detected slightly above S-1 and S-2 standards in the sample SS-7, which was collected in an area adjacent to the access road to the municipal landfill. The low level detected PAHs is likely due to vehicle use and maintenance at the site, as well as possibly aboveground portable storage of waste oil, which was observed in the vicinity of SS-1 during GZA's explorations. No other PAHs were detected above S-1 or S-2 standards.

Herbicides and pesticides were not detected in sample TP-19, which was collected from the hill adjacent to the recycling area, and in a former gardening area.

#### 6.5 LABORATORY ANALYTICAL RESULTS IN GROUNDWATER

Table 2 summarizes laboratory analytical results for groundwater samples collected from test pits and monitoring wells. The analytical results reported below are compared with GW-1 and GW-2 standards, if applicable, provided in the RCMP. The GW-1 standards are equivalent to AGQSs (i.e., drinking water standards), which are enforceable by the State of New Hampshire. The GW-2 standards are used to assess potential health risks due to inhalation of vapors containing groundwater contaminants.

Three metals were detected at elevated concentrations in groundwater samples collected by GZA in December 1999 and/or April 2000, including arsenic (GW-1 of 0.05 mg/L), cadmium (GW-1 of 0.005 mg/L), and chromium (GW-1 of 0.1 mg/L). Arsenic was detected at concentrations ranging from 0.06 to 0.29 mg/L in two grab samples from test pits (TP-6 and TP-12), and in two samples from monitoring wells (MW-8A and MW-12), which are widely spaced across the site. Chromium was also detected in the grab groundwater sample from TP-12 (Cocheco River bank and northwest of former WWTP) at a concentration of 0.14 mg/kg. Cadmium was detected in groundwater samples from three wells including WP-1

(Cocheco River bank-and near former school bus garage) at a concentration of 0.007 mg/L, MW-13 (former WWTP area) at a concentration of 0.013 mg/L, and GZ-3 (former quarry area, and likely downgradient of municipal landfill) at a concentration of 0.006 mg/L.



The PAH naphthalene (GW-1 of 0.02 mg/L and GW-2 of 6 mg/L) was detected above its GW-1 standard in the grab groundwater sample from test pit TP-14 (0.076 mg/L), and groundwater sample from well MW-12 (0.26 mg/L). No other elevated concentrations of PAHs were detected in the sample from TP-14, which is located in the former WWTP area, or in the sample from MW-12, which is located adjacent to the existing pump and UST area. While 6 to 14 other PAHs were detected in the groundwater samples from five wells (WP-1, MW-10, MW-12, MW-13, and GZ-2), and grab samples from three test pits (TP-4, TP-12, and TP-14), none of the detected concentrations were above GW-1. Bis(2-ethyhexyl)phthalate was detected at a low concentration (0.008 to 0.035 mg/L) in three (TP-10, MW-5, and MW-8A) of the four samples analyzed for ABNs. No other ABNs were detected.

#### 7.0 ENVIRONMENTAL ISSUES AND SITE DEVELOPMENT CONSIDERATIONS

#### 7.1 ASBESTOS-CONTAINING BUILDING MATERIALS

ACMs that remain within Site buildings, if any, will require proper abatement prior to any demolition or renovation of the Site buildings.

#### 7.2 WETLANDS

Filling, construction, or any other disturbance of identified wetlands is restricted in the State of New Hampshire, and can occur only with the approval of the NHDES under a wetlands permit. Two wet areas observed by GZA and previously identified as wetlands are shown on the Site plan, Figure 2. One area is located east of the former WWTP storage area and downslope of the existing municipal solid waste landfill. The second area is shown south of the municipal solid waste landfill. Landfill material may extend into these wet areas.

#### 7.3 BURIED SOLID WASTE

Buried solid waste is a primary issue affecting site redevelopment. Solid waste can be expected within the limits of the municipal solid waste landfill, in the vicinities of the former WWTP and its storage area, and, to a more limited extent, between the existing DPW buildings and Cocheco River. Historical information indicates that the solid waste was placed prior to 1981, which is when current New Hampshire Solid Waste Rules became effective. Consequently, the solid waste can possibly be left in-place provided it is permitted/registered and/or closed in a manner acceptable to the NHDES Solid Waste Management Bureau. Closure may be required, because there is at least some groundwater impact due to the presence of the solid waste, as indicated by the exceedance of the GW-1 standard for groundwater collected from test pit TP-12. Closure may include capping with soil and/or engineered materials.

As part of future building and utilities layout and design in these areas, additional explorations will be needed to further characterize the nature and thickness of the material, and to evaluate engineering characteristics, such as compressibility and/or bearing strength. Special

considerations for construction over these materials will include the release of methane gas and settlement due to decomposition of organic materials, and presence of insects and rodents attracted to organic solid waste. A qualified geotechnical engineer should be engaged to assess feasible foundation alternatives and pavement/capping design, as the project requires. If encountered during excavation activities for building foundations and utilities, the solid waste should be disposed off site at an authorized facility.



## 7.4 BURIED HAZARDOUS WASTE-CONTAINING OR PETROLEUM-CONTAINING SOILS OR SOLID WASTE, SEPARATE FROM TANK AREAS

Based on existing subsurface information presented herein, GZA does not recommend removal of soil or buried solid waste prior to site redevelopment. There are no apparent source areas of groundwater contamination or localized "hot spots" separate from tank areas. However, GZA does recommend field screening of soils excavated during site redevelopment activities for metals using a hand-held x-ray fluorescence analyzer and for VOCs using a PID to segregate excavated materials for characterization and determination of final disposition. Laboratory analytical testing for metals, PAHs, and VOCs should be performed in connection with characterization of excavated soils.

#### 7.5 SURFICIAL SOILS

Based on correspondence with Mr. Robert Minicucci of the NHDES, the arsenic concentrations detected in surficial soil samples are representative of background concentrations.

### 7.6 GROUNDWATER QUALITY MONITORING, PERMITTING, AND GROUNDWATER MANAGEMENT ZONE

Due to detect concentrations of several metals and naphthalene above GW-1 standards and possible closure of the on-site solid waste area, GZA recommends groundwater quality monitoring in accordance with a GMP, pursuant to Env-Wm 1403.12. The Groundwater Management Zone (GMZ) identified in the GMP should include the area of the existing buildings, and former WWTP and adjacent storage. A proposed limit for the GMZ is shown on Figure 2. While the term of a GMP is typically five years, groundwater quality monitoring under a GMP can be expected to continue indefinitely with GMP renewal every five years due to the presence of solid waste.

In consideration of the incongruent timing of the petroleum and non-petroleum investigations and remedial measures, and early stage of site redevelopment planning, GZA recommends that a GMP for petroleum issues be implemented initially without inclusion of monitoring for non-petroleum issues. At a later date, tentatively late Summer of 2001, when solid waste issues have been addressed and site redevelopment plans are better defined, then the petroleum-related GMP can be revised to include non-petroleum-related groundwater quality monitoring.

#### 7.7 ACTIVITY AND USE RESTRICTIONS

Activity and Use Restrictions (AURs) are site controls that protect human health and the environment when potential hazards, such as buried solid waste and contaminated groundwater, are present on site. A GMP to establish a program to monitor contaminated groundwater is one type of de-facto AUR that should be implemented at the site, as described above. Solid

waste permitting is another type of de-facto AUR. If no solid waste permit is required, then an excavation AUR should be implemented to establish protocols for managing solid waste or contaminated soils and groundwater that may be encountered during future excavations. The excavation AUR would address excavation procedures (including health and safety), and environmental testing and management of materials excavated during site development or maintenance. Based on correspondence with Mr. Minicucci of the NHDES, formulation of AURs should wait until after the solid waste permitting issues are addressed.



#### 7.8 PARTIAL LIABILITY OF RELEASE

Based on the findings presented in this report, GZA recommends that the City request the NHDES issue a Certificate of Partial Completion for site-wide hazardous waste (non-petroleum) issues. This certificate would be issued following agreement of solid waste permitting/registration and/or closure requirements, GMP modification, and specific AURs, if any, with the NHDES. After on-site petroleum-issues have been abated, on-site solid waste issues have been addressed to the satisfaction of the NHDES, and specific AURs, if any, have been implemented, GZA recommends that the City request a comprehensive Certificate of Completion and/or a Certificate of No Further Action.

#### 8.0 REFERENCES

#### **DOCUMENTS**

- Novotny, Robert F., "The Geology of the Seacoast Region, New Hampshire," 1969.
- Morgan, "Phase I Archeological Assessment, Cocheco River Dredging Project, Dover, NH," September 1984.
- Dunn, "Draft Environmental Site Assessment Report," dated July 24, 1991;
- Dunn, "Follow-Up Phase I Environmental Site Assessment Report," dated February 7, 1992;
- TWM, "Assessment for UST Closure," dated February 8, 1996;
- CEH-JW, "Site Investigation Report," dated November 1997;
- JWC, "Remedial Action Plan," dated May 3, 1999; and
- Granite State Explorations' test boring logs for proposed WWTP expansion (not realized), performed 1976 to 1978.

#### **PHOTOGRAPHS**

- Obtained from New Hampshire Department of Transportation
  - 1. November 1962, #124423 369, scale: 1 inch = 200 feet
  - 2. March 1979, USDA #33017 374 29, scale: 1 inch = 200 feet
  - 3. 1981, USDA #33017-180-48A, scale: 1 inch = 400 feet

- 4. April 11, 1989, #B52 635, scale 1 inch = 400 feet
- Obtained from The City, Engineer's Office
  - 5. August 17, 1951, No identification number, scale: 1 inch = 100 feet.

#### **MAPS**



- Obtained from The City, Engineer's Office
  - 1. 1967 Topographic map, Sheets 86 and 97, Compiled and Controlled by James W. Sewall Company of Old Town, Maine by photogrammetric methods from aerial photographs dated November 30, 1967, Scale 1 inch = 100 feet
- Obtained from GZA's in-house files
  - 2. 1956 (Photorevised 1973 and 1988) USGS Quadrangle, Dover East, ME NH,

Scale: 1:24,000 Culture and drainage in part compiled from aerial photographs taken 1943. Topography by planetable surveys 1944. Culture revised by the Geological Survey 1956

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**TABLES** 

#### TABLE 1 LABORATORY ANALYTICAL RESULTS - SOIL, mg/kg

Dover Department of Public Works River Street, Dover, New Hampshire

					Towns or Personal State of Sta					TES	T PIT SAME	LES								1				SIIDEI	CIAL SOIL	CAMPI CC					
Chemical Name	Standard	(mg/kg)	TP - 1	TP - 2	TP - 3	TP - 4	TP-4A	TP - 5	TP - 6	TP - 8	TP - 9	TP - 10	TP - 11	TP - 12	TP - 13	TP - 14	TP - 18	TP2-5	TP2-16	SS-1	SS-2	SS-3	SS-4	SS-5	7		SS-7	SS-8	CC 0	T 66.10	Parriament
	S-1	S-2	11-12 ft.	5	11-11.5 ft	. 5-6 ft.	DUP TP-4		4-5 ft.	3-4 ft.	2-3 ft.	6-7 ft.	4-5 ft.	4-5 ft.	2-3 ft.	7-9 ft.	2-3 ft.	5.5-7.5 ft.	3-5 ft.	55-1	55-2	33-3	33-4	33-3	SS-6	SS-6A DUP SS-6	33-7	33-0	SS-9	SS-10	Equipment Blank
Metals							A STATE OF THE STA											10.0 1.0 1.	0010	<del></del>	Lucus					7 DOF 55-0	L	1			Dialik
Arsenic	12	12		3	9	8	<2	-	5	<2	<2	<2	<2	<2	_	<2	_	3	4	17		21	14	6	13	. 14	16 3	14	1.1	25	0.02
Barium	750	2500	1 -	380	730	64	66	_	18	58	48	67	37	74	-	150		63	83	43	17	47	31	16	24	24	22	37	13	76	0.02
Cadmium	32	230	1 -	2.6	1.8	0.5	0.5	_	0.4	0.4	0.6	7.3	5.7	0.8	_	4.6	_	1.5	1.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.001
Chromium	Note 7	Note 7	1 -	77	65	24	25	-	23	48	62	240	43	1800	_	260	_	55	40	36	27	32	15	9.2	14	13	11	13	2.9	20	0.001
Lead	400	400	-	1300	1600	450	870	-	71	200	250	180	36	140	-	630	_	97	250	49	10	42	31	22	34	35	100	56	2.5	20 37	
Mercury	1	7	-	0.5	0.5	0.8	0.6	### <b>-</b>	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	_	1.2	_	<0.2	0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.01 < 0.0002
Selenium	260	2500	-	<2	<2	<2	<2	_	<2	<2	<2	<2	<2	4.<2	_	<2		<2	<2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 0.2		
Silver	45	200	1 -	2.1	2.1	0.2	<0.2	_	<0.2	< 0.2	0.4	0.9	<0.2	0.3	_	1		<0.2	<0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 2 < 0.2	< 0.05 < 0.005
PAHs/ABNs									10.2	10.2	0.1	0.0	10.2	0.0				<u> </u>	<u> </u>	₹ 0.2	< 0.2	₹ 0.2	< 0.2	₹ 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.005
Naphthalene	5	5	-	< 0.2	< 0.2	<3	<2	8.7	<4	< 0.2	< 0.2	4.4		< 0.3	< 0.2		_	0.7	0.8	<0.040			< 0.040	< 0.040	< 0.080	-0.000	< 0.400				.0.0001
2-methylnaphthalene	150	150	1 -	< 0.2	<0.2	<3	<2	8.3	<4	<0.2	<0.2	1.4	_	<0.3	<0.2	_		0.2	1.6	<0.040	-	-	< 0.040	< 0.040	< 0.080	<0.080 <0.080	< 0.400	-	-	-	< 0.0001
Acenaphthylene	300	300	1 -	0.3	<0.2	<3	3	0.3	<4	<0.2	0.4	<0.3		<0.3	<0.2		-	<0.2	<0.3	<0.040	-	-	0.16	< 0.040		<0.080	< 0.400	-	-	-	<0.0001
Acenaphthene	270	270	-	<0.2	<0.2	<3	3	<0.2	<4	<0.2	<0.2	3.2	_	<0.3	<0.2	_		<0.2	0.4	<0.040	-	-	< 0.040	< 0.040	<0.080 <0.080	< 0.080	0.5	-	-	-	<0.0001
Fluorene	810	2500	1 -	< 0.2	<0.2	4	5	0.3	<4	<0.2	0.2	4.3	_	<0.3	<0.2	_	-	<0.2	0.4	<0.040	-	-	<0.040	< 0.040				-	-	-	1000.0>
Phenanthrene	Note 5	Note 5		0.3	0.9	41	37	0.8	5	0.7	2.2	23		0.5	<0.2	_		1.2	2.3	0.19	-	-	0.15		<0.080	<0.080	0.5	-	-	-	< 0.0001
Anthracene	1000	1700	1 -	<0.2	0.3	12	12	0.4	<4	0.7	0.7	6.8		<0.3	<0.2		-	0.2		0.19	-	-		<0.040	0.2	0.2 <0.080	5	-	-	-	<0.0001
Fluoranthene	810	2500	l -	0.8	2	73	49	2.3	16	1.1	6.1	22		0.7	<0.2	-	•	<0.2	0.5 2	H	-	•	0.07 0.33	< 0.040	<0.080		i.i	-	-	-	<0.0001
Pyrene	Note 5	Note 5	_	1.1	1.9	120	44	2.8	24	1.1	5.4	19	-	0.7	<0.2	-	-	1.1	-	0.42	-	-		0.09	0.49	0.45	5.5	-	-	-	< 0.0001
Benzolalanthracene	0.7	2	_	0.8		63	24	1.6	21	0.6	3.1	13		0.7	<0.2	•	-	0.5	0.8	0.41 0.23	-	-	0.57	0.14	0.53	0.53	4.4 <b>2.2</b>	-	-	-	< 0.0001
Chrysene	70	200	1 -	0.9	2007-000000-000000000000000000000000000	60	23	1.6	18	0.6	3	12	=	0.4	<0.2	-			0.8	R	-	-	0.23	0.06	0.28	0.25	a minima de la company de la c	-	-	-	<0.0001
Benzolbifluoranthene	7	20		1	î	35	25	¥ 2	7	0.6	2.4	9.4		0.4	<0.2	-	•	0.6 0.4	0.9	0.22 0.29	-	-	0.22	0.06	0.28	0.27	1.9	-	-	-	<0.0001
Benzo[k]fluoranthene	7	20		1.4	0.8	26	20	1.4	9	0.4	2.5	8.6		< 0.3	<0.2	-	-	0.4	0.8	0.29	-	-	0.46	0.12	0.39	0.44	2.7	-	-	-	< 0.0001
Benzo[a]pyrene	0.7	0.7		1.3	and the Printer of the Control of th	37	24	1.7	9	0.5	2.6	10		0.4	<0.2	-	-	0.2		0.23	-	-	0.28	0.09 0.07	0.36	0.29	1.7 <b>2.1</b>	-	-	-	<0.0001
Indeno[1,2,3-cd]pyrene	0.7	2	_	0.5	<0.2	21.		0.8	<4	<0.2	1.4	4.7	-	< 0.3	<0.2	-		<0.2	0.6	1	-	-	0.27		0.26	0.25	CONTRACTOR OF THE PROPERTY OF	-	-	-	<0.0001
Dibenzja,hlanthracene	0.7	0.7	-	<0.2	<0.2	<3	. 3	<0.2	<4	<0.2	<0.2	< 0.3		< 0.3	<0.2	-	-	<0.2	<0.3	0.05 <0.040	-	-	0.1	<0.040	<0.080	<0.080	0.7	-	-	-	< 0.0001
Benzolg,h,ilpervlene	Note 5	Note 5	1 -	0.4	0.5	21	8	0.8	<4	<0.2	1.2	4.3	_	< 0.3	<0.2	-	-	<0.2	<0.3 <0.3	0.040	-	-	0.07 0.1	<0.040 <0.040	<0.080	< 0.080	< 0.400	-	-	-	< 0.0001
VOCs	7.232.3		1					0.0		10.2	1.0	4.5			10.2			<0.2	<0.5	0.04			0.1	<0.040	<0.080	<0.080	0.7				<0.0001
Toluene	100	100	< 0.05	_	< 0.05	< 0.05	< 0.05	2.7	< 0.05	_	< 0.06	< 0.05	< 0.05		< 0.06	_	< 0.05			l											
Tetrachloroethene	2	2	< 0.05	-	0.49	< 0.05	< 0.05	<0.5	0.11		0.16	< 0.05	<0.05	_	<0.06	_	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	- 1
Chlorobenzene	NA	NA	< 0.05	-	< 0.05	< 0.05	< 0.05	<0.5	<0.05		<0.06	< 0.05	0.07	_	<0.06	_	<0.05	•	-	-	-	-	-	-	-	-		-	-	-	- 1
Dibromochloromethane	NA	NA	< 0.05	-	0.36	< 0.05	< 0.05	<0.5	<0.05	_	<0.06	< 0.05	<0.05	-	<0.06		<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	140	140	<0.05	-	< 0.05	<0.05	<0.05	6	< 0.05	_	<0.06	<0.05	<0.05		<0.06		< 0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xvlenes	500	1000	< 0.05	-	< 0.05	< 0.05	<0.05	66	<0.05	_	<0.06	< 0.05	< 0.05		<0.06	_	<0.05	-	-		-	-	-	-	-	-	-	-	-	-	- 1
iso-Propylbenzene	123	123	<0.05		<0.05	< 0.05	< 0.05	53	< 0.05	_	<0.06	<0.05	<0.05	_	<0.06	_	<0.05	-	-		-	-	-	-	-	-	-	-	-	-	-
n-Propylbenzene (AB)	Note 6	Note 6	<0.05		<0.05	< 0.05	<0.05	4.1	<0.05		< 0.06	< 0.05	<0.05	_	<0.06	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	•	-	- 1
1,3,5-Trimethylbenzene (AB)	Note 6	Note 6	<0.05		< 0.05	< 0.05	<0.05	19	<0.05	_	<0.06	< 0.05	<0.05		<0.06	-	<0.05	-	- 1	-	-	-	-	-	-	-	-	-	-	-	- 1
sec-Butylbenzene (AB)	Note 6	Note 6	<0.05		<0.05	< 0.05	<0.05	0.9	<0.05	-	< 0.06	<0.05	<0.05	_	<0.06	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-
p-isopropyltoluene (AB)	Note 6	Note 6	<0.05	_	<0.05	< 0.05	<0.05	0.7	<0.05	-	< 0.06	< 0.05	<0.05	-	< 0.06	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	6	9	<0.05	_	<0.05	< 0.05	<0.05	<0.5	<0.05	-	< 0.06	<0.05	0.06	-	< 0.06	-		-	- 1	•	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	5	5	<0.3	_	<0.3	<0.03	< 0.3	4	< 0.03	-	< 0.4		< 0.3	-	< 0.06	-	< 0.05	•	-	-	-	-	-	-	-	-	-	-	-	-	- 1
1,2,4-Trimethylbenzene (AB)	Note 6	Note 6	<0.05		<0.05	<0.05	<0.05	61	<0.3 <0.05	-	<0.4	<0.3 <0.05		-		-	< 0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-,-, · · · · · · · · · · · · · · · · · ·	NOIC O	11010 0	10.00		\U.UJ	<b>NO.00</b>	NO.00	THE STATE OF THE S	V0.00	-	<0.00	<0.05	< 0.05	-	<0.06	-	< 0.05		- 1	-	-	-	-	-	-	-	-	-	-	-	- !

- GZA GeoEnvironmental, Inc. collected grab samples from all test pits during the period from December 20 through December 22, 1999 (TP-series), and on April 11, 2000 (TP2-series). GZA collected surficial soil samples on April 21, 2000. "DUP" refers to a duplicate sample for the indicated exploration.

  The samples were analyzed by Eastern Analytical, Inc. of Concord, New Hampshire for the eight RCRA metals by EPA Method 6010B, (7174 for Mercury), polynuclear aromatic hydrocarbons (PAHs) and acid/base/neutral extractable (ABNs) compounds (TP-2 and TP-6 only) by EPA Method 8270C and volatile organic compounds (VOCs) by 8260B. Parameters not detected in any samples are not shown.

  Concentrations are given in units of milligrams per kilogram (mg/kg). "c" indicates not detected for the limit shown. "-" indicates not analyzed.
- 5. Concentrations are given in units of minigrants per knogrant (fig/kg). < Indicates not detected for the limit shown. \*\*Indicates not analyzed.

  The S-1 and S-2 standards are from the New Hampshire Department of Environmental Services Risk Characterization and Management Policy, dated January 1998. "NA" indicates not applicable or no standard available.

  The S-1 and S-2 standards for the sum total of the three compounds Benzo (g, h, i) perylene, phenanthrene, and pyrene are 480 and 2,400 mg/kg.

  The S-1 and S-2 standards for the sum total of alkybenzene compounds (AB) are both 59 mg/kg.

  The S-1 and S-2 standard for Chromium III are 1,000 and 2,500 mg/kg, respectively. The S-1 and S-2 standard for Chromium VI are 130 and 460 mg/kg, respectively. The detected concentrations are for total Chromium so the S-1 and S-2 standards do not strictly apply.

  Shading and bolding indicates exceedances of the S-1 standard. Underlining indicates exceedance of the S-2 standard.

#### TABLE 2 LABORATORY ANALYTICAL RESULTS - GROUNDWATER AT TEST PITS AND MONITORING WELLS, mg/L

Dover Department of Public Works River Street, Dover, New Hampshire

						<del></del>		TEST	PITS						T						MONITOD	ING WELLS						
Chemical Name	Ctondo	rd (mg/L)	TP - 2	TP - 3	TP - 4	TP - 4	TP - 6	TP - 9	TP - 10	TP - 11	TP - 12	TP - 13	TP - 14	TP - 17	WP-1	MW-1	MW-5	Laws	1 191101	T 1511 10			T 181110	T				
Chemical Name	GW-1	GW-2	11-2	11.3	117 - 4	Dup	117-0	117-9	17 - 10	18-11	IP - 12	IP - 13	1P - 14	117-17	WP-1	WW-1	MW-5	MW-8A	MW-8A Dup	MW-10	MW-10 Dup	MW-12	MW-13	MW-14	MW-14 Dup	GZ-1	GZ-2	GZ-3
Metals	1	<del>                                     </del>	<del>                                     </del>	<del> </del>		<del>                                     </del>	The second second	<del>                                     </del>					<del> </del>	1	<b>i</b>		<del>                                     </del>		Бар		Бар	<del> </del>	<del>                                     </del>		- Dup			
Arsenic	0.05	NA	0.03	< 0.01	<0.01	<0.01	0.06	0.05	0.02		0.26	< 0.01	0.05	<0.01	0.03	< 0.01	0.01	0.06		<0.01	<0.01	0.29	0.02	0.01	< 0.01	< 0.01	< 0.01	. 0.01
Barium	2.00	NA	0.11	0.27	<0.05	<0.05	0.08	0.1	<0.05		<0.05	<0.01	0.45	<0.05	0.31	< 0.05	0.01	0.54		<0.01	<0.01	0.49	0.02	0.01	< 0.01	< 0.01		< 0.01 0.28
Cadmium	0.005	NA	0.001	<0.001	<0.001	<0.001	0.004	<0.001	<0.001		<0.001	0.002	0.001	<0.001	0.007	< 0.001	0.001	0.004		<0.001	<0.001	0.003	0.013	0.10	0.002	< 0.001	0.41	0.006
Chromium (total)	0.1	NA	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002		0.14	0.002	0.007	<0.002	0.018	< 0.001	<0.001	<0.004		<0.001	<0.001	<0.003	<0.002	0.001	< 0.002	0.001	0.004 0.003	
Lead	0.015	NA	<0.01	< 0.01	<0.01	<0.01	<0.01	<0.01	<0.01		<0.01	< 0.002	<0.007	<0.01	<0.01	<0.002	<0.01	<0.002		<0.002	<0.002	<0.002	<0.002	<0.002	< 0.002	0.002	< 0.003	< 0.002 < 0.001
Selenium	0.05	NA	<0.05	< 0.05	<0.05	<0.05	< 0.05	<0.05	<0.05		<0.05	< 0.05	<0.01	<0.05	<0.05	0.004	<0.01	<0.01		<0.05	<0.01	<0.01	<0.01	<0.001	< 0.001	<0.002	0.001	
Silver	0.05	NA	< 0.005	<0.005	<0.005	<0.005	0.007	< 0.005	<0.005		<0.005	<0.005	<0.005	<0.005	<0.005	< 0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005	< 0.001	< 0.001	< 0.005	< 0.001	<0.001 < 0.005
PAHs/ABNs	0.00	1.22	10.000	10.000	10.000	10.000	0.007	10.000	10.000		X0.003	<0.003	<0.003	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	<u> </u>	< 0.003	X0.003	X0.003	<del></del>	20.003	<0.003	<0.005	<0.003	< 0.003	< 0.005	< 0.005	< 0.005	< 0.005
Naphthalene	0.02	6	<0.005	<0.0001	<0.0001	<0.0001	0.0009	0.0021	<0.005		0.015	<0.0001	0.076	<0.0001	<0.0001	<0.0001	<0.005	<0.01	< 0.01	<0.0001		0.26	0.0085	<0.0001	<0.0001	0.015	0.0031	<0.0001
2-methylnaphthalene	0.28	10	< 0.005	<0.0001	0.0002	0.0001	0.0003	0.0001	<0.005		0.0019	<0.0001	0.0041	<0.0001	<0.0001	<0.0001	<0.005	<0.01	<0.01	<0.0001		0.065	<0.0001	<0.0001	<0.0001	0.013	0.0031	<0.0001
Acenaphthylene	0.42	NA	< 0.005	< 0.0001	0.0003	0.0002	0.0018	< 0.0001	<0.005		0.0003	< 0.0001	<0.0001	<0.0001	0.0007	<0.0001	<0.005	<0.01	<0.01	0.0001		<0.003	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	<0.0001
Acenaphthene	0.42	NA	< 0.005	<0.0001	< 0.0001	<0.0001	0.0003	< 0.0001	<0.005		<0.0001	< 0.0001	0.01	<0.0001	<0.0001	<0.0001	<0.005	<0.01	<0.01	<0.0001		0.007	0.007	<0.0001	<0.0001	<0.0001	0.0003	<0.0001
Fluorene	0.28	NA	< 0.005	< 0.0001	< 0.0001	< 0.0001	< 0.0001	<0.0001	< 0.005		< 0.0001	< 0.0001	0.0038	<0.0001	< 0.0001	<0.0001	<0.005	<0.01	<0.01	<0.0001		0.004	0.0069	<0.0001	<0.0001	<0.0001	0.0062	<0.0001
Phenanthrene	0.21	NA	<0.005	<0.0001	0.001	0.0007	0.0017	0.0003	< 0.005		<0.0001	< 0.0001	0.0043	<0.0001	0.0025	<0.0001	<0.005	<0.01	< 0.01	<0.0001		0.004	0.0045	<0.0001	<0.0001	0.0006	0.0058	<0.0001
Anthracene	2.1	NA	< 0.005	<0.0001	0.0005	0.0004	0.0025	<0.0001	< 0.005		<0.0001	< 0.0001	< 0.0001	<0.0001	0.0007	<0.0001	<0.005	<0.01	< 0.01	<0.0001		0.001	<0.0001	<0.0001	<0.0001	<0.0001	0.0034	<0.0001
Fluoranthene	0.28	NA	< 0.005	0.0001	0.0013	0.001	0.0095	0.0002	<0.005		0.0031	< 0.0001	0.0013	0.0001	0.0052	<0.0001	<0.005	<0.01	<0.01	0.0007		0.001	0.0009	< 0.0001	<0.0001	<0.0001	0.0052	0.0002
Pyrene	0.21	NA	< 0.005	0.0002	0.0013	0.0009	0.0091	0.0003	<0.005		0.003	< 0.0001	0.0011	0.0001	0.0054	<0.0001	<0.005	<0.01	<0.01	0.0007		<0.001	0.001	< 0.0001	< 0.0001	< 0.0001	0.0032	0.0002
Benzo[a]anthracene	0.01	NA	<0.005	<0.0001	0.0009	0.0006	0.0078	<0.0001	<0.005		0.0017	< 0.0001	<0.0001	< 0.0001	0.003	< 0.0001	<0.005	<0.01	<0.01	0.0005		<0.001	0.0005	< 0.0001	< 0.0001	<0.0001	0.0007	<0.0001
Chrysene	0.01	NA	< 0.005	<0.0001	0.0011	0.0008	0.0067	<0.0001	<0.005		0.0017	< 0.0001	< 0.0001	< 0.0001	0.0032	< 0.0001	<0.005	<0.01	<0.01	0.0005		<0.001	0.0005	< 0.0001	< 0.0001	< 0.0001	0.0017	<0.0001
Benzo[b]fluoranthene	0.01	NA	< 0.005	<0.0001	0.001	0.0009	0.0075	0.0002	<0.005		0.0016	< 0.0001	0.0003	0.0001	0.0029	< 0.0001	<0.005	<0.01	<0.01	0.0005		<0.001	0.0004	< 0.0001	< 0.0001	<0.0001	0.0010	<0.0001
Benzo[k]fluoranhene	0.01	NA	< 0.005	<0.0001	0.0008	0.0006	0.0058	0.0002	<0.005		0.0013	< 0.0001	0.0002	<0.0001	0.0023	<0.0001	<0.005	<0.01	<0.01	0.0004		<0.001	0.0003	< 0.0001	<0.0001	<0.0001	0.0009	<0.0001
Benzo[a]pyrene	0.01	NA	< 0.005	0.0001	0.001	0.0008	0.007	0.0002	<0.005		0.0014	< 0.0001	0.0003	<0.0001	0.0026	<0.0001	<0.005	<0.01	< 0.01	0.0005		<0.001	0.0004	< 0.0001	< 0.0001	<0.0001	0.0009	<0.0001
Indeno[1,2,3-cd]pyrene	0.01	NA	< 0.005	<0.0001	< 0.0001	<0.0001	0.0037	<0.0001	<0.005		< 0.0001	< 0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.005	<0.01	< 0.01	< 0.0001		<0.001	<0.0001	< 0.0001	< 0.0001	<0.0001	<0.0001	<0.0001
Benzo[g,h,i]perylene	0.21	NA	< 0.005	<0.0001	0.0014	0.001	0.0033	<0.0001	<0.005		0.0008	< 0.0001	< 0.0001	< 0.0001	0.0017	<0.0001	<0.005	<0.01	<0.01	0.0003		<0.001	<0.0001	< 0.0001	< 0.0001	<0.0001	0.0004	<0.0001
bis(2-Ethylexyl)phtalate	NA	NA	< 0.005						0.008								0.035	0.01	<0.01									
VOCs	1			1															10.02									T
Ethylbenzene	0.7	30	< 0.001	<0.001	< 0.001	<0.001	< 0.001	0.002	<0.001	< 0.001					<0.001		< 0.001	<0.001		<0.001	<0.001							
Isopropylbenzene	0.28	NA	< 0.001	<0.001	< 0.001	<0.001	< 0.001	0.002	<0.001	< 0.001				™k 	< 0.001		<0.001	<0.001		<0.001	< 0.001							
Tetrachloroethene	0.005	3000	0.004	<0.002	< 0.002	<0.002	0.003	<0.002	< 0.002	< 0.002					<0.002		<0.002	<0.002		<0.002	< 0.002							
1,2,4-Trimethylbenzene	0.05	NA	< 0.001	<0.001	< 0.001	<0.001	< 0.001	0.002	< 0.001	< 0.001					< 0.001		<0.001	<0.001		<0.001	< 0.001							1

#### Notes:

- 1. GZA GeoEnvironmental, Inc. collected grab samples from test pits and monitoring wells during the period from December 20 through December 22, 1999. "Dup." refers to a duplicate sample for the indicated well. The sample designation for the duplicate for MW-10 is "MW-01." The sample designation for the duplicate for MW-8A is "MW-8A-DUP."
- The samples were analyzed by Eastern Analytical, Inc. of Concord, New Hampshire for the eight RCRA metals by EPA Method 6010B (7174 for Mercury), polynuclear aromatic hydrocarbons (PAHs) and acid/base/neutral extractable (ABNs) (TP-2, TP-10, MW-5, and MW-8A only) compounds by EPA Method 8270, and volatile organic compounds (VOCs) by EPA Method 8260B or 8021B. Parameters not detected in any samples are not shown.

  Concentrations are given in units of milligrams per liter (mg/L), which are approximately equivalent to parts per million. "<" indicated not detected for the limit shown. "-" indicates not analyzed.

  The GW-1 and GW-2 standards are from the New Hampshire Department of Environmental Services Risk Characterization and Management Policy, dated January 1998. GW-1 standards are equivalent to Ambient Groundwater Quality Standards.
- "NA" indicates not applicable or no standard available.
- Shading and bolding indicates exceedance of the GW-1 standard.

**FIGURES** 

© 2000 GZA GeoEnvironmental, Inc.

2000 GZA
GeoEnvironmental, Inc.
Engineers and Scientists
380 HARVEY ROAD
MANCHESTER, NEW HAMPSHIRE 03103 GRAPHIC SCALE 1000° (603) 623-3600 1000' : AUG. 2000 :1"=1000 DRAWN BY: M.A.N. DES'D BY : J.L.H. CHK'D BY : N.J.N. APP'D BY : S.R.L. SCALE DATE DOVER PUBLIC WORKS DOVER, NEW HAMPSHIRE **LOCUS PLAN** RIVER STREET PROJECT No.: 22457 FIGURE No.:

# APPENDIX A HYDROGEOLOGIC LIMITATIONS

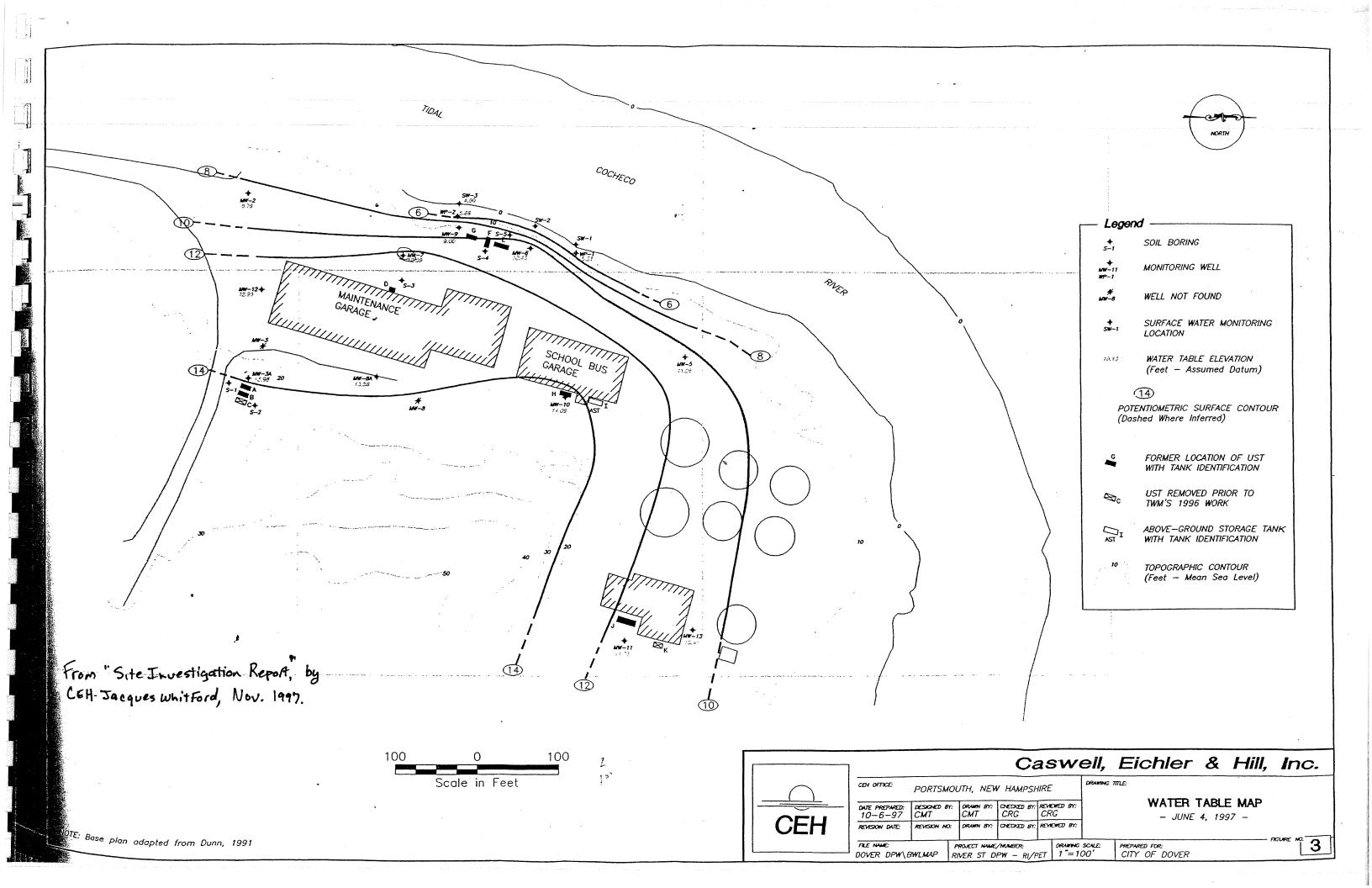
#### HYDROGEOLOGICAL LIMITATIONS

- 1. The conclusions and recommendations submitted in this report are based in part upon the data obtained from a limited number of soil samples from widely spaced subsurface explorations. The nature and extent of variations between these explorations may not become evident until further investigation. If variations or other latent conditions then appear evident, it will be necessary to reevaluate the recommendations of this report.
- 2. The generalized soil profile described in the text is intended to convey trends in subsurface conditions. The boundaries between strata are approximate and idealized and have been developed by interpretations of widely spaced explorations and samples; actual soil transitions are probably more gradual. For specific information, refer to the boring logs.
- 3. Water level readings have been made in the test pits, borings and/or observation wells at times and under conditions stated on the exploration logs. These data have been reviewed and interpretations have been made in the text of this report. However, it must be noted that fluctuations in the level of the groundwater may occur due to variations in rainfall and other factors different from those prevailing at the time measurements were made.
- 4. Except as noted within the text of the report, no quantitative laboratory testing was performed as part of the site assessment. Where such analyses have been conducted by an outside laboratory, GZA GeoEnvironmental, Inc. (GZA) has relied upon the data provided, and has not conducted an independent evaluation of the reliability of these data.
- 5. The conclusions and recommendations contained in this report are based in part upon various types of chemical data and are contingent upon their validity. These data have been reviewed and interpretations made in the report. As indicated within the report, some of these data are preliminary "screening" level data, and should be confirmed with quantitative analyses if more specific information is necessary. Moreover, it should be noted that variations in the types and concentrations of contaminants and variations in their flow paths may occur due to seasonal water table fluctuations, past disposal practices, the passage of time, and other factors. Should additional chemical data become available in the future, these data should be reviewed by GZA, and the conclusions and recommendations presented therein modified accordingly.
- 6. Chemical analyses have been performed for specific parameters during the course of this study, as detailed in the text. It must be noted that additional constituents not searched for during the current study may be present in soil and groundwater at the site.
- 7. It is recommended that this firm be retained to provide further engineering services during design, implementation, and/or construction of any remedial measures, if necessary. This is to observe compliance with the concepts and recommendations contained herein and to allow design changes in the event that subsurface conditions differ from those anticipated.

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#### APPENDIX B

INFORMATION FROM REFERENCED REPORTS



# **FABLE 3**

# CITY OF DOVER DPW SITE - ENVIRONMENTAL ASSESSMENT

# WATER QUALITY DATA (2)

ANALYTES (1)	MCL (3) Nov.91	527.93	SZ1/91 9/5/91	MW-Z 5/21/81: 9/5/81	W.Z 9/5/91	NV 5/21/91	NW:3	14W-4 5/2/181 9/5/81		MW-5. 5/21/81 9/5/91		MW-6 5/21/91 9/5/91		MW-7-W 9/5/391 9/	MW-& SW-1 9/5/91 9/5/91 (5)	(-1 SW-2	2. 5W-3	TP:8.	TP:0.
VOCs (ug/l) Trichleroethylene	٧n	7	1.1	8	8	8	8	8	8	8							1	6	6
1,2 - Dichloroethylene	20	7	-	8	8	8	8	8	8	8	<b>*</b> :		유	8 8	80			8 6	8 8
Велхеле	۰,	8	8	8	8	6870	5470	8	58.1	8		•	7400					8 8	3 5
Toluene	1000	8	8	8	8	¥7500	20200	8	8	8			8					8	8
Ethylbenzene	700	8	8	8	8	3847	1440	8	8	8			510			•		8	8 8
Total Xylenes .	1000	8	8	8	8	19870	32410	323.9	818	8		•	2000					4	3.7
Chlorobenzene	\$	8	8	8	8	8	8	58.1	48.1	8			8					-	2.5
Methyl t-buryl Ether	씾	8	8	8	@	2800	2320	8	80	8		13500 3	1300			ANP ANP	ANP	8	43.0
TPH (mg/l)	및	8	8	8	8	153	110	10.3	4.	80	80	2	10	80	BO At	ANP ANP	ANP	0.1	
BASE/NEUTRALS (ug/l) 2-Methylnaphthalene	뿢	AN	ANP	ANP	8	Ā	ANP	ANP	8	A P P	80		20					AND	QN A
Naphthalene	08	ANP	ANA	ANA	8	ANA	AN P	AND	8	AND	80	ANA	200	ANP	ANP A	ANP ANP	P ANP	ANP	ANP
METALS (ug/l) (4)																			
Arsenic	20	ANP	ANP	8	ANP	8	ANP	& &	ANP	80	ANP		ANP		_			ANA	AND
Bartum	2000	ANP	8	<del>5</del>	8	<b>3</b>	8	550	360	470	8	_	8					8	20
Cadmium	w	ANP	80	8	8	•	8	7	80	8	80		8					8	8
Chromium	8	ĀV	8	8	80	8	8	8	80	8	80		8					8	8
Lead	15•	ANP	8	8	8	\$	8	1200	8	8	8	_	8					150	8
Mercury	7	AN	8	0.7	80	8	8	8	80	9.0	80		8	.m				8	8
Selenium	20	ANP	ANP	8	ANP	8	ANP	8	AND	8	ANP		ď		_			ANA	ANA
Silver	Ä	ANP	8	8	8	8	8	8	8	8	8	140	8	8	BD A	ANP ANP		ANP	ANA
Sodium (mg/l)	250-	ANA	280	AND	980	A.	8	AND	160	ANP	8		750		•		140	ANP	ANP
INORGANICS (mg/l)							3	9	į		į	9	;	;					
• Busines	230	Š	ž	Ž	86	Ž	8	ž	9/5	Ž Ž	0	A N D	280	8	7 <b>9</b>	18	2 <b>8</b> 0	AN P	Ą

NOTES: 1. VOCs - Volatile Organic Compounds

TPH - Total Petroleum Hydrocarbons

BD - Below Laboratory Detection Limits. MW - Monitoring Well

SW - Surface Water Sample from Cocheco River TP - Groundwater Sample from Test Pits in WWTF Storage Area ANP - Analyses Not Performed.

3. MCL - Maximum Contaminant Level as outlined in USEPA "Orthking Water Regulations and Health Advisories". November 1991. NE indicates MCL not established

indicates lead action level equal to 0.015 mg/l as established in USEPA "Drinking water Regulations and Health Advisones" November 1991.

\*Enforceable Secondary Maximum Contaminant Level for community public water system under NH Code of Administrative Rules Part Env-Ws 319.01

\*May 1991 samples and September 19, 1991 test pit samples. TP-8 and TP-9, were preserved in the field with nitric acid without fillening.

Seotember 5, 1991 samples were littered in the laboratory and then preserved with nitric acid.

The results from May 1991 were all below the detection limit for VOCs & TPH. These were not analyzed for ABN. Chloride, Sodium or metals in May 1991.

From "Follow- UP Phose I Environmental Site Assessment," by Dunn Cosposation, dated February 7,19

#### Table 6 Groundwater Quality Data Volatile Organic Compounds

Sample ID:	Method 1	MW-2	MW-2	MW-2
Matrix:	Standards	Aqueous	Aqueous	Aqueous
Date Received:	NH GW-1 (GW-2)	9/20/96	10/4/96	10/1/98
Units:	ppb	μg/L	μg/L	μg/L
Date of Analysis:		9/24/96	10/9/96	10/7/98
Analyst:		CWC	TML	JDS
EPA Method:		8260	8020	8060
Dilution Factor:		1	1	1

Note: Shaded Value indicates an exceedance of Method 1 Standards.

NA - Not Available
U - Not detected at the indicated detection limit
NAF - Not Analyzed For
\* - Value is for Total Xylenes

Table 6
Groundwater Quality Data
Volatile Organic Compounds

Sample ID:	Method 1	MW-3A		MW-3A		MW-3A	
Matrix:	Standards	Aqueous		Aqueous		Aqueous	
Date Received:	NH GW-1 (GW-2)	9/20/96		10/4/96		6/4/97	
Units:	μg/L	μg/L		μg/L		μg/L	
Date of Analysis:	· · · · · · · · · · · · · · · · · · ·	9/26/96		10/9/96		6/4/97	
Analyst:	8 8	CWC		TML		TML	
EPA Method:	. 4-	8260		8020		*8020(mod)	
Dilution Factor:		10		10		100	
Benzene	5 (2,000)	420		510		500	
Naphthalene	20	20	197	NAF		900	
Toluene	1,000	20		30		1,600	
Ethylbenzene	700	10	U	10	U	400	
1,2,4-Trimethylbenzene	NA	190		NAF		NAF	
1,3,5-Trimethylbenzene	NA	100		NAF		NAF	
o-Xylene	10000 (6,000)*	720		NAF		6,800	
m,p-Xylene	10000 (6,000)*	730		NAF		11,000	
MTBE	70	4600		3000		2000	U
Total Xylenes	10000 (6,000)	NAF		1500		NAF	

Note: Shaded Value indicates an exceedance of Method 1 Standards.

NA - Not Available

U - Not detected at the indicated detection limit

NAF - Not Analyzed For

\* - Value is for Total Xylenes

Sample ID:	Method 1	MW-5	MW-5
Matrix:	Standards	Aqueous	Aqueous
Date Received:	NH GW-1 (GW-2)	9/20/96	10/4/96
Units:	ppb	μg/L	μg/L
Date of Analysis:		9/26/96	10/9/96
Analyst:		CWC	TML
EPA Method:		8260	8020
Dilution Factor:		1	1

Note: Shaded Value indicates an exceedance of Method 1 Standards.

NA - Not Available
U - Not detected at the indicated detection limit
NAF - Not Analyzed For
\* - Value is for Total Xylenes

Table 6
Groundwater Quality Data
Volatile Organic Compounds

Sample ID:	Method 1	MW-6		MW-6	MW-6		MW-6	
Matrix:	Standards	Aqueous		Aqueous	 Aqueous		Aqueous	
Date Received	NH GW-1 (GW-2)			10/4/96	6/4/97		10/1/98	
Units:	μg/L	µg/L		μg/L	μg/L		μg/L	l
Date of Analysis:	• . Vis	9/27/96		10/9/96	6/4/97		10/7/98	- 1
Analyst:		CWC		TML	TML		JDS	- 1
EPA Method:	8 V.	8260		8020	*8020(mod)		8260	
Dilution Factor:	AT SHARE THE AT	10		10	100		10	- 1
Benzene	5 (2,000)	2700		2500	1,100		1,600	
sec-Butylbenzene	NA	10	U	NAF	NAF		20	
Ethylbenzene	700	930		1100	700		830	
Isopropylbenzene	NA	50		NAF	NAF		60	
p-Isopropyltoluene	NA ·	1		NAF	NAF		20	
Naphthalene	20	300		NAF	1,000		300	
n-Propylbenzene	NA	10	U	NAF	NAF		150	
Toluene	1,000	420		70	100	J	40	
1,2,4-Trimethylbenzene	NA	950		NAF	NAF		970	
1,3,5-Trimethylbenzene	NA	190		NAF	NAF		290	
o-Xylene	10000 (6,000)*	950		NAF	300		40	
m,p-Xylene	10000 (6,000)*	2600		NAF	2,300		1,600	
MTBE	70	800		500	2000	U	200	
Total Xylenes	10000 (6,000)	NAF		2700	NAF		NAF	

NA - Not Available
U - Not detected at the indicated detection limit
NAF - Not Analyzed For

· ·

<sup>\* -</sup> Value is for Total Xylenes

Sample ID:	Method 1	MW-7	MW-7
Matrix:	Standards	Aqueous	Aqueous
Date Received:	NH GW-1 (GW-2)	9/20/96	10/4/96
Units:	ppb	μg/L	μg/L
Date of Analysis:		9/27/96	10/9/96
Analyst:		CWC	TML
EPA Method:		8260	8020
Dilution Factor:		1	1

Note: Shaded Value indicates an exceedance of Method 1 Standards.

NA - Not Available

U - Not detected at the indicated detection limit

NAF - Not Analyzed For

Sample ID:	Method 1	MW-8A	MW-8A
Matrix:	Standards	Aqueous	Aqueous
Date Received:	NH GW-1 (GW-2)	9/20/96	10/4/96
Units:	ppb	μg/L	μg/L
Date of Analysis:	American de la composición dela composición de la composición de la composición de la composición de la composición dela composición de la composición de la composición dela composición dela composición de la c	9/25/96	10/9/96
Analyst:		CWC	TML
EPA Method:	netua Netua	8260	8020
Dilution Factor:	1 * * * * * * * * * * * * * * * * * * *	1	1
Toluene	1,000	1 U	6
2-Butanone (MEK)	170	20	NAF

Note: Shaded Value indicates an exceedance of Method 1 Standards.

NA - Not Available

U - Not detected at the indicated detection limit

NAF - Not Analyzed For

Table 6 Groundwater Quality Data Volatile Organic Compounds

Sample ID:	Method 1	MW-9		MW-9		MW-9		MW-9	
Matrix:	Standards	Agueous		Aqueous		Aqueous		Aqueous	
Date Received:	NH GW-1 (GW-2)	1 '		10/4/96		6/4/97		10/1/98	
Units:	μg/L	μg/L		μg/L		μg/L			
Date of Analysis:	μg/L	9/25/96		10/9/96		6/4/97		μg/L 10/7/98	
Analyst:		CWC		TML		TML	•	JDS	
EPA Method:		8260		8020		*8020(mod)		8260	
Dilution Factor:		10		10		1		10	l
Dilution Lactor.		10		10			*****	10	
Benzene	5 (2,000)	4400	**************************************	4100	I	2,100	****	690	
Ethylbenzene	700	250	_	240	-	200		120	
Isopropylbenzene	NA	10	U	NAF	-	NAF		20	H
Naphthalene	20	110	9	NAF	-	150		100	
n-Propylbenzene	NA ·	10	U	NAF		NAF		60	<del>                                     </del>
Toluene	1,000	120	-	110	-	.45		10	
1,2,4-Trimethylbenzene		170			-			130	
1,3,5-Trimethylbenzene	NA			NAF		NAF			
	NA	10		NAF		NAF		10	
o-Xylene	10000 (6,000)*	30		NAF		47		10	U
m,p-Xylene	10000 (6,000)*	340	1	NAF		500		80	
MTBE	70	1200		900		220		100	U
Total Xylenes	10000 (6,000)	NAF		360		NAF		NAF	

NA - Not Available
U - Not detected at the indicated detection limit
NAF - Not Analyzed For
\* When is for Total Valence.

Sample ID:	Method 1	MW-10	MW-10
Matrix:	Standards	Aqueous	Aqueous
Date Received:	NH GW-1 (GW-2)	9/20/96	10/4/96
Units:	ppb	μg/L	μg/L
Date of Analysis:	a a service de la companya de la co	9/25/96	10/9/96
Analyst:	\$ 	CWC	TML
EPA Method:		8260	8020
Dilution Factor:		10 1 St. 25	1
Toluene	1,000	1 U	8
total Xylenes	10000 (6,000)	NAF	12

Note: Shaded Value indicates an exceedance of Method 1 Standards.

NA - Not Available
U - Not detected at the indicated detetion limit
NAF - Not Analyzed For

Table 6 Groundwater Quality Data Volatile Organic Compounds

Sample ID:		T		· · · · · · · · · · · · · · · · · · ·			
4	Method 1	MW-11		MW-11		MW-11	
Matrix:	Standards	Aqueous		Aqueous		Aqueous	
Date Received:	NH GW-1 (GW-2)	9/20/96		10/4/96		6/4/97	
Units:	ppb	µg/L		μg/L		μg/L	
Date of Analysis:		9/25/96		10/9/96		6/4/97	
Analyst:		cwc		TML		TML	
EPA Method:		8260		8020		*8020(mod)	١
Dilution Factor:		1		1		1	,
Benzene	5 (2,000)	19		16		11	
sec-Butylbenzene	NA	2		NAF	П	NAF	
Chlorobenzene	100.	6		1	U	NAF	
1,4-Dichlorobenzene	75	1		NAF		NAF	
Ethylbenzene	700	1	U	6		1	
Isopropylbenzene	NA	5		NAF		NAF	
p-IsopropyItoluene	NA	6		NAF		NAF	
Naphthalene	20	75		NAF		65	
1,2,4-Trimethylbenzene	NA	15		NAF		NAF	
1,3,5-Trimethylbenzene	NA	1		NAF		NAF	
o-Xylene	10000 (6,000)*	1		NAF		1	U
m,p-Xylene	10000 (6,000)*	6		NAF		3	
2-Butanone (MEK)	170	20		NAF		NAF	
Total Xylenes	10000 (6,000)	NAF		7		NAF	

NA - Not Available

U - Not deteted at the indicated detection limit

NAF - Not Analyzed For

Table 6 Groundwater Quality Data Volatile Organic Compounds

Sample ID:	Method 1	MW-12	MW-12
Matrix:	Standards	Aqueous	Aqueous
Date Received:	NH GW-1 (GW-2)	6/4/97	10/1/98
Units:	μg/L	μg/L	μg/L
Date of Analysis:		6/9/97	10/7/98
Analyst:	1.14	JDS	JDS
EPA Method:		8260	8260
Dilution Factor:	****	100	100
Benzene	5 (2,000)	3,100	3,100
sec-Butylbenzene	NA	10 U	20
Ethylbenzene	700	2,000	1,700
Isopropylbenzene	NA	100	90
Naphthalene	20	300	360
Toluene	1,000	500	60
n-Propylbenzene	NA	200	200
1,2,4-Trimethylbenzene	NA	1,400	1,000
1,3,5-Trimethylbenzene	NA	200	190
o-Xylene	10000 (6000)*	1,000	80
m,p-Xylene	10000 (6000)*	5,400	2,900
MTBE	70	3,000	2,900

Table 6 Groundwater Quality Data Volatile Organic Compounds

Sample ID:	Method 1	MW-13	MW-13
Matrix:	Standards	Aqueous	Aqueous
Date Received:	NH GW-1 (GW-2)	6/4/97	10/1/98
Units:	ppb	μg/L	μg/L
Date of Analysis:		6/11/97	10/7/98
Analyst:		JDS	JDS ·
EPA Method:		8260	8260
Dilution Factor:		1	1
Benzene	5 (2,000)	7	2
Chlorobenzene	100	7	4
Naphthalene	20	49	48
Toluene	1,000	1 U	2
o-Xylene	10000 (6000)*	1	1 U
m,p-Xylene	10000 (6000)*	1	1 U

Sample ID:	Method 1	WP-1	WP-1
Matrix:	Standards	Aqueous	Aqueous
Date Received:	NH GW-1 (GW-2)	9/20/96	10/4/96
Units:	ppb	μg/L	μg/L
Date of Analysis:		9/25/96	10/9/96
Analyst:		CWC	TML
EPA Method:		8260	8020
Dilution Factor:		1	1
Naphthalene	20	1	NAF

Note: Shaded Value indicates an exceedance of Method 1 Standards.

NA - Not Available

U - Not detected at the indicated detection limit

NAF - Not Analyzed For

Sample ID:	Method 1	WP-2	WP-2	WP-2
Matrix:	Standards	Aqueous	Aqueous	Aqueous
Date Received:	NH GW-1 (GW-2)	9/20/96	10/4/96	6/4/97
Units:	μg/L	µg/L	μg/L	μg/L
Date of Analysis:		9/25/96	10/9/96	6/4/97 .
Analyst:		CWC	TML	TML
EPA Method:		8260	8020	*8020(mod)
Dilution Factor:		1	1	1
Benzene	5 (2,000)	41	20	200
Toluene	1,000	NAF	NAF	1
o-Xylene	10000 (6000)*	NAF	NAF	1
Naphthalene	20	NAF	NAF	3
MTBE	70	480	500	650

Note: Shaded Value indicates an exceedance of Method 1 Standards.

NA - Not Available
U - Not detected at the indicated detection limit
NAF - Not Analyzed For

<sup>\* -</sup> Value is for Total Xylenes

Table 7 Groundwater Quality Data

:

# Polynuclear Aromatic Hydrocarbons

	7.	0 1010	0, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,			ſ
sample ID:	Method I	6-VVM	MW-10	MW-11	MW-13	
Matrix:	Standards	Adueous	Aqueous	Aqueous	Agueous	
Date Received:	NH GW-1	9/20/6	9/20/96	9/20/96	6/4/97	
Units:	qdd	µg/L	Hg/L	nd/L	T/DII	
Date of Extraction:		9/24/96	9/24/96	9/24/96	6/5/97	alve,
Date of Analysis:		9/56/96	9/56/96	9/26/96	6/12/97	
Analyst:		TDS	TDS	TDS		
EPA Method:		8270	8270	8270	8270	
						1
Naphthalene	20	52	5	40	71	
2-Methylnaphthalene	280	n 9	5	25	2	15
						1

Page 1 of 1

NA - Not Available U - Not detected at the indicated detection limit Shaded Value indicates an exceedance of Method 1 Standards

Page 1 of 1

Table 8
Surface Water Quality Data
Volatile Organic Compounds

Sample ID:	Method 1	SW-1	SW-2	C-/WS	S///-3	0 / / / 0
Matrix.	Cton Jan 3	· · · · · · · · · · · · · · · · · · ·		1	7-2-2	2.440
	Standard	Adneons	Adneons	Adneons	Agueous	Aditeons
Date Received:	NH GW-1 (GW-2)	9/20/96	9/20/96	10/1/98	90/06/0	20,7,00
l'Inite.	1	,	2		2/20/20	98/1/01
	nďď	hg/L	l µg/L	ng/L	na/L	
Date of Analysis:		9/27/96	96/22/6	10/7/08	0/24/0	1 6
10000		i		00/2/0-	9/1/30	86///01
Allalyst.		<u></u>	_ - - -	SCO	Į.	٥
EPA Method:		0000	000		1 1 1	ט מ מ
	-	0000	0700	8260	8020	8260
Dilution Factor:		-	7-	τ.		) )
			-			

## DUNN GEOSCIENCE CORPORATION VIIIage West, Box 7078

9-11-91 TIME	JOB NO	<u>09791</u>
9-11-91 TIME	TEST PIT	10. <u>FTP-1</u>
DOVER - DTW SITE	DPW Garage Tuel Is	land
ION EXCAV	ATOR DPW	
EQUIPA	MENT Bockhue	
NONE INSPE	CTOR Garret Graces	Keimp
	F SOIL	REMARKS
0-1' Brown, med to coo	wel, dry.	PID = Ø Strong petrol. udor from executation
Mrd to coorse	Gravel, dry/domp.	PTD - 1830 AP
Refue: framing	, dong wood brick	PID = 1808A
1		FED ~1100pg
Maderial from	MP-1, 1-10' and	Change of the contract of the
	9-11-91  DOVER - DILL)  SITE  EXCAV.  EQUIPM  NONE  DESCRIPTION OF  O-1' Brown, med to come med to coarse Gravel  And to coarse Gravel  Fefure: garden framing wood  3-7' Block coarse SM  coarse Gravel,  Refure: framing  7-10' Light to mad. Blue-9  CLAY damp  BOH - 10'  NO LEDGE  NO GROUNIDWHTER  SOIL SMAPLE  TT-1 IS a comy	9-11-91  JOVER - DILL)  SITE DPW Garage Flue ITS  EQUIPMENT Bockhoe  NONE  INSPECTOR Garret Graces  DESCRIPTION OF SOIL  O-1' Brown, med to coarse SAND, tr  Med to coarse Gravel, dry.  I-3' Olive-gay to Black, coarse SAND, tr  Aird to coarse Gravel, dry/domp.  Refuse: garden hose, copper pipe, framing word (2x4), brick  3-7' Black, coarse SAND, tr med to  coarse Gravel, domp  Refuse: framing word, bricke  7-10' Light to mad. Blue-gray to Olive-gray  CLAY, damp  BOH - 10'  NO LEDGE  NO GROUN'DWATER

# DUNN GEOSCIENCE CORPORATION Village West, Box 7078 Laconia, NH 03246

DATE	STAR	TED	9-11-91 TIME JOB NO	C8781
DATE	FINIS	HED _	9-11-91 TIME TEST PIT N	10. <u>FTP-2</u>
CLIE	NT _C	ITY OF	DOVER DEW SITE DEW Garage Fue	1 Island
SURI	FACE E	LEVAT	ION EXCAVATOR DPW	
DATU	M		EQUIPMENT Backhoe	
WATE	R ELE	VATION	4.5 + BGS INSPECTOR Garrel Graces	
DEPTH			DESCRIPTION OF SOIL	REMARKS
- 0- - 5- - 10-			O-1' Brown, med. to coarse SAND,  to the time to med. Gravel, damp  1-2' Dark Brown to Olive-gray Brown  med. to coarse SAND, tr med.  to coarse Gravel, damp  2-4.5' Black to Dark Brown med to.  coarse SAND, tr fine Gravel  domp to moist  Refuse: back, wood, metal shypring  1.5-10' Light In mod. Blue-gray CLAY  Moist.  BOH = 10'  NO LEDGE.  GROUND WATER  1.5'  SOIL SAMPLE:  TP-1 is a composite somple of  Malerial from FIP-1 1-10' and  FIP-2 1-10'	PID = DPPM  PID = 4000 PPM  FITD = 2500 PPM  NATURAL  GROUND
	1			

## DUNN GEOSCIENCE CORPORATION VIllage West, Box 7078

DATE	STAR	TED	9-11-91	TIME		JOB NO	og181
			9-11-91	TIME		TEST PIT N	10. <u>FTP-3</u>
CLIE	NT <u>C1</u>	14 OF	DOVER - DRU	<u>.                                    </u>	TE Cache	co River Fuel-	Island
SUR	FACE E	LEVAT	ION	Ε.	XCAVATOR .	DAN	
•	JM		en e	E	QUIPMENT	Backhoe	-
l			6.5' ± BG.	S	ISPECTOR	Garret Gaust	CO MAP
DEPTH		MOIST.		DESCRIPTION	N OF SO		REMARKS
<u> </u>			0-0.3	Asphalt		SAND	PID = ppm
		. 18 - 1224	0-1.5'	little + fine	6 Gravel	o coarse SAND dry	no odor
	1		1.5 - 2.0'	Asphalt			
			2.0-3.0	Block to m	od. Yellow	- brown	PIO = 1886/7
		A STATE		fine to coors	e SAND,	holudad), dry	
5-	1 1	k da sarah	30-50			le, med to	PTO - 1723 AP
		100		rootse SA	ND, +-	Gravel, damp.	
				Refuse: br		-livo	NATURAL
			5.0 - 4.0	Gray-olive fine SAND	wet	- 51102	GROWN D
	1						
-10-	1		BOH =	9.0'			
			NO LEI		- 1		
			GROOM	OWNTER @	<b>6.</b> 5		
	<del>-</del>						
-				5 AMPLE		To some of	
-15-	4				· · · · · · · · · · · · · · · · · · ·	te sample of 3, 2-9' and	
		200		F17-4 0			
				, , , , , , , , , , , , , , , , , , ,		•	
	7						

## DUNN GEOSCIENCE CORPORATION Village West, Box 7078

DATE	STAR	TED	9-11-91 TIME JOB NO	08781
DATE	FINIS	HED _	9-11-91 TIME TEST PIT I	NO. <u>FTP-4-</u>
CLIE	NT <u>C</u> I	IY of )	DOVER - DAU SITE Cocheco River Tue	Lisland
SUR	FACE E	ELEVAT	ION EXCAVATOR DPW	
DATU	M		EQUIPMENT Back hoe	
WATE	ER ELE	VATION	7' ± BGS INSPECTOR Garres Gran	stromp
DEPTH	DENS.	MOIST.	DESCRIPTION OF SOIL	REMARKS
_0_			0-7.5' Dusty Yellow Brown medium to coarse SAND, little coorse Growel (includes crushed slone), trace—cobbles and boulders to 21-"	PID=1782 ppm @~SFeet
_ 5 _				Fill to BOH
10			BOH = 7.5 ' NO LEDGE GROUNDWATER @ ~7'.	
15			SOIL SAMPLE  TP-3 is a composite sample  of material from FTP-3, 2-9'  and FTP-4, 0-7.5'.	

#### TEST PH LOG

#### DUNN GEOSCIENCE CORPORATION Village West, Box 7078 Laconia, NH 03246

DATE	STARTED _	9/19/91 TIME JOB NO	08781
DATE	FINISHED	9/19/9/ TIME TEST PIT !	NO. TP-Z
CLIENT	T CITY C	OF DOJER - DPW SITE TREATMENT PLANT	STURAGE
SURFAC	CE ELEVAT	TION EXCAVATOR DENNES (5	2077 <u>s</u>
DATUM		EQUIPMENT BACKHOE	
WATER	ELEVATION	1 ±8 FT BGS INSPECTOR MARK LEDGA	.≥D
(FT,) DEPTH DI	ENS. MOIST.		REMARKS
-5-		2" Bloken Aspracy W/ Pel-Br., tim to Course Samo, general 22-6" Gray, fine, SAND, little Self 6-17" Gray ish-White, fine - medium SAND  12-14" Rests & Weep shavings  1.5-3' Brown, fine to Medium SAND, few Organic Selfs  3-6' Olice-Gray, fine SAND, SICT and CLAY  (Passible Dredgings)  6-11' Municipal Solid Waste  (wood, metal, glass, switer, sand and gravel)  MIXED 12/ Sand, gravel and Sile	la.
		11-12' light Gray, STET and CLAY	- Original Ground ±
	·	END OF TEST PET @ 12 FEET	
15		- Photovac TIP Meter Readings 2101  William Source Source AMPRIS From  16 FART FORMPOSETE SOURCE (ST	

#### IEST PH LUG

## DUNN GEOSCIENCE CORPORATION Village West, Box 7078

DATE	STAR	TED	9/19/91 TIME JOB NO	08781
DATE	FINIS	HED	9/19/9/ TIME TEST PIT N	0. <u>TP-1</u>
CLIE	NT <u></u>	F77 0,	DOVER - DPW SITE TREATMENT PLANT	h
SURI	FACE E	LEVAT	ION EXCAVATOR DENNES LIE	077 <u> </u>
DATU	M		EQUIPMENT BACKHOE	
WATE	ER ELE	VATION	#8 Fz. 865 INSPECTOR MARK LEDGA	5.)
(FT,) DEPTH	DENS.	MOIST.	DESCRIPTION OF SOIL	REMARKS
		is the time many.	0-1' Yellow-Brown, fine to Mediam SAND	
	÷1.	\$		
	1 - 142 1		1-4' Olive - Giry, fine SAND, little gravel and cubbles to Sin. Dia., few silt	
_5-			4-5' WOOD and ROOTS	(A)
,				
			5-8' Olive-Guy, fine SAND, Little graveland cubble,	
-10-			8-12' Municipal Solid Waste	-
			(nouspeper, buttless, wood, blick, metal, sand,	-Original
			12-14' Light Oliver-Gray, STLT and CLAY	Growd +
-15-			END OF THAT PET OF 14 FEET	<u>π</u>
	-		(1) - The towar TIP nicles Readings all <181	'v 1
			OUR STOR OF TEST PY WALL	
	_			

#### IESI PII LUG

## DUNN GEOSCIENCE CORPORATION VIllage West, Box 7078

Laconia, NH 03246 DATE STARTED 9/19/91 TIME \_\_\_\_\_ JOB NO. 08781 DATE FINISHED 9/19/91 TIME \_\_\_\_\_ TEST PIT NO. Te-3 CLIENT CITY OF DOUER - DPW SITE TREATMENT PLANT STURAGE SURFACE ELEVATION \_\_\_\_ EXCAVATOR DENNIS LIBOTIE EQUIPMENT BACKHOE WATER ELEVATION = 10 Ft. BGS INSPECTOR MARK LEDGARD (F1,) DEPTH DENS. MOIST. REMARKS **DESCRIPTION OF** SOIL 0-1' Red-Blown, fine to Medium SAND, few fine ginvel 1-2 ' Giny, f. SAND, little Silt, few (s-fg, Cabble 5'Dia. 2-5' Brown, fine to Medium SAND, few Organic Silts - 5 -5' Thin layer of Reuts 5-9.5' Olise - Gary, fine SAND, STET and CLAY W/occasional Brick, metal & cloth pieces -10-9.5-12' Municipal Solid Waite Wifing SArin, STET and cont Diedgings 12-14' LEATHER HIDES and Municipal Solid Waite Origina 1 14+ Gray, STIT and CLAY Gross d ±14 -15-END OF TEST PITO 14 FEET - Photover TIP Metal Poodings KIPPM - Come in Sixe Strate Com Com. 11 - 1 - 1 - 1 - 2 - 1 - (ST-1)

# DUNN GEOSCIENCE CORPORATION Village West, Box 7078 Laconia, NH 03246

DATE	STAR	TED _	7/19/91 TIME JOB NO	08781
DATE	FINIS	HED _	9/19/91 TIME TEST PIT I	10. <u>TP-4</u>
CLIE	NT <u>C</u>	F77 G	DOVER - DPW SITE TREATMENT PLANT	STURNGE
SURI	FACE E	LEVAT	ION EXCAVATOR DENNES LT	2077 E
DATU	JM		EQUIPMENT BACKHOE	
WAT	ER ELE	VATION	Mone Observed INSPECTOR MARK LEDGA	2D .
(FT.) DEPTH	DENS.	MOIST.	DESCRIPTION OF SOIL	REMARKS
-0-			0-1' Brown, f-m SAND, little silt, few Cg - fg	
•			1-2' Brown, f-m SAND, few Organic Soilt	
			2-5' Mise. fill (ie., rubber, metal, glass wood) mired w/f. SANO, SICT & CLAY DARDETHES	
_5_			1 - F CERT DERINGS AG 1	- Original
	·			61001 9 7 2 ,
			5-11' light Olive-Yellow, fine SANO, few Sice	
-10-				
			11-12' GIAY, STIT & CLAY	
			END OF THE PITO 12 FEET	
			-Thomas TIP Meter Prodings 2100M	
15				
			·	
	i	I	1	1

#### IESI TII LUU

## DUNN GEOSCIENCE CORPORATION Village West, Box 7078

DATE	STAR	TED	7/19/91 TIME JOB NO	08781
DATE	FINIS	HED _	9/19/9/ TIME TEST PIT N	0. <u>TC-5</u>
CLIE	NT <u>(</u>	E77 G	LE DOVER - DPW SITE TREATMENT PLANT	STURAGE
SUR	FACE E	LEVAT	ION EXCAVATOR DENNIS LIE	077 £
DATU	M		EQUIPMENT BACKHOE	
WAT	ER ELE	VATION	+11 FT. BGS INSPECTOR MARK LEDGA!	<u> </u>
(FT,) DEPTH	DENS.	MOIST.	DESCRIPTION OF SOIL	REMARKS
			0-1' Yellow-Birwn, fine to Coaise SAND & GRAVEL, few Si	→ ************************************
	1 1 24		1-4' Dark Gray, fine SAND, Cittle M-C sand, and f-C gravel, few cobbler to Sin. Dia, few silt mired w/municipal solid Waste (ie. rubber, glass Moud, me to 1)	
-5-	e arti		4-6' Decomposed Organic Matters wood pieces and logs	
		y Ademi	6-10 Diedsings of Gray, f samp, star & clay	
-10-		•,	10-11' light Olive, fine SAND, few Sic4	:
•			11-12, Municipal Solid Waste (ic., slus, metal, louther	
		ar a masari n	12'+ Gray, SILT and CLAY END OF TEST PITO 12 FEET	•
·. ·			- Photovac TJP Meter Rendings < IPPM	
<u> </u>	-		- COURTER SOIL SAMPLE FROM 6-8 Ft.	
_				
	1			

# DUNN GEOSCIENCE CORPORATION Village West, Box 7078 Laconia, NH 03246

DATE	STAF	RTED _	9/19/91 TIME JOB NO	08781
DATE	FINIS	SHED _	9/19/9/ TIME TEST PIT I	
CLIE	:NT <u></u>	ITY C	OF DOJER - DPW SITE TREATMENT PLANT	
			ION EXCAVATOR DENNES (J	
DATU	M		EQUIPMENT BACKHOE	
WATE	R ELE	VATION	TIOFEET GGS INSPECTOR MARK LEDGA	2D
(FT,) DEPTH	DENS.	MOIST.		REMARKS
			0.6" Red-Brown, fire-Coasse SAND, little force - Coasse gravely little sile, little cobbles to Sinch Dia. Prival W/ msw & CD (bricks, metal, glass, rubba, wood)  5-7' Logs, Wood Planks & misc. wood  7-9' Light Olive, fine SAND, few silt w/ clocks of Olive Grav silt & clay (Dridgings)  9-11' ASH W/Wood shavings and paper  11-12' light Olive Gray, fine SAND, little sile  END OF TEST PIT @ 12 FEAT  - Holever TIP Meter Personnes < 1 PPM	- Oliginal Ground

#### IESI FII LUU

## DUNN GEOSCIENCE CORPORATION Village West, Box 7078

DATE	STAR	TED	9/19/91 TIME JOB NO	1878
DATE	FINIS	SHED	9/19/9/ TIME TEST PIT N	0. <u>TP-7</u>
			10N EXCAVATOR DENNES (JR	
	JM		EQUIPMENT BACKHOE	
			=8FT. BAS INSPECTOR MARK LEDGAS	2 <i>)</i>
(FT,) DEPTH		MOIST.		REMARKS
			0-1' REO-BION., f-C SAND, Little f-C gravel	
-5-			1-7' Dit. Gray, fine SAND, little f-Cgravely' Cobblet to Stock Dian, little solt mixed w/msw & CD (Bricks, Glass, Robber, Wood, Paper)	
-10-		e a seguer i	8-10! Leather Hides and Misc, MSW	- Original
			10-12' Light Olive-Gray, fine SAND, few Citt  END OF THIT PET @ 12 FEET	610001
16		The second secon	- Thotase TIP METER FRADINGS < IPPM - Consider Source Sample (2 7 FERT FOR. Completing SAMPLE (ST-1)	
		A		

## DUNN GEOSCIENCE CORPORATION VIllage West, Box 7078

DATE	STAR	TED _	7/19/91 TIME JOB NOC	1878
DATE	FINIS	HED _	9/19/9/ TIME TEST PIT N	0. <i>TF-</i> \$
CLIE	:NT <u>(</u>	F77 G	DOVER - DPW SITE TREATMENT PLANT	STURNER
SUR	FACE E	ELEVAT	ION EXCAVATOR DENNES LIE	077 E
DATU	M		EQUIPMENT BACKHOE	
WATI	ER ELE	VATION	#8 FT. ESS INSPECTOR MARK LEDGAS	<b>5</b> D
(FT,) DEPTH		MOIST.		REMARKS
<del>-</del> 0-			0-1' YELLOW-BENNIN, Sine - Medium SAND	
			1-51 Nive-Gray, fine SAND, Little Silt, few Coarse gravely 1862 to Sinch. Dia.	
-5-			LAYER OF ASCHAIL OS FERT	•
			5-8' Olive, fine SAND, Little Silt	
			LATER OF DOM O 8 FIFT (PEAT)	- Original Ground
			8-10' Dik. Olive Gray, Are SAND, little silt	Green &
-10-			END OF THE TETO 10 FERT	
			MAN DOR TO FATA	
			- Grander COCATED DOWNGRASSON	
-15-		٠.	" ( ID WATER SAMPLE ! 1-8	
	-			
	1			·
	1		•	
-				·

## DUNN GEOSCIENCE CORPORATION VIllage West, Box 7078

DAT	E STAR	TED	7/19/91	TIME		JO	B NOC	8781
DAT	E FINIS	HED _	9/19/91	TIME		<u> </u>	ST PIT NO	). <u>TP-9</u>
CLI	ENT <u>C</u>	177 Q	E DOVER -	DPW	SITE TR	EATMENT	PLANT	STURAGE
SUR	FACE E	LEVAT	ION	•	EXCAVATO	R DENM	25 650	<i>277 ⊈</i>
DAT	UM		<u> </u>		EQUIPMEN	BACK	HOE	Autor in england
WAT	ER ELE	VATION	<u> + 817. B</u>	65	INSPECTO	R MARK	LEDGAR	22
(FT,) DEPTH	DENS.	MOIST.		DESCRIPT	ION OF	SOIL		REMARKS
			0-11 Yel. Fi	cir. Cine	- medin	SAND		Transport from the state of the
				·				-
			19. <b></b>	· · · · · · · · · · · · · · · · · · ·	A AAN ALLA	city for	Const	
			1-5' Olive- 6 gravel	4 × 2 4	Sind Tia		•	
			Layer OF 1	SEHALL CO.	5 FT.		4 	·
3	1				•			Service Control of the Control of th
• ;			5-8' 01:20;	fir SAN	Dy little Si	(+ )		
	1		layer or	TOWN (PERTY)	a 8/5/2			
		1.44	8-10' Drk.	otive Glays	fine SA.110,	little sic	,	
_10-	1							la constant de la con
	4	100	END O	e The F	TO 10	FFET	•	
	-	and the	- 74	etoric TI	o Meren	PEARINGI	No-	
	-		7,	Fre W DOK	75 18A + 4			
	-			77			·	
-16-	-			T Trivana	CAZNO · J	<b>ア</b>		la manadata esta de la casa de la
	-		-Coc	in in the	PATER -CA	MPLK TO	- 7 .	
	1		·	•				'Appli Taganananananananananananananananananana
	-							1
-								
1	ı	1	1					

## DUNN GEOSCIENCE CORPORATION Village West, Box 7078

DAT	E STAF	RTED	9/19/91 TIME JOB NO	08781									
DATI	E FINIS	SHED _	9/19/9/ TIME TEST PIT	NO. TP-10									
CLI	ENT <u>C</u>	ITY 6	2 DOVER - DPW SITE TREATMENT PLANT	STURAGE									
SUR	FACE I	ELEVAT	ION EXCAVATOR DENNES (5	2077 E									
DAT	JM		EQUIPMENT BACKHOE										
WAT	WATER ELEVATION INSPECTOR MARK LEDGAR												
DEPTH	DENS.	MOIST.	DESCRIPTION OF SOIL	REMARKS									
			0-6" LOAM W/Grass ROOTS										
			as-1.5' Brown, fine SAND, little Silt										
				·									
			1.5-4' Olive-Gray, fine SAND, Cittle Sile	·									
-5-	÷												
	:												
			4-10' Olive-Gray fine SAND, little Silf mixed										
·			With CD (1.95, Wood, Brick, Metal, Boulders, leather Hides)										
	٠.		tracker moets										
-10-	•			- Origina 1									
			10-12' light Olive, fine SAND, little sill	Ground									
			END OF TEST PAT @ 12 FEET										
	•		- Thotore TIP METER FRAM. 161 CIPPM	·									
-15-	:												
		·		·									
	£												

#### DUNN GEOSCIENCE CORPORATION Village West, Box 7078 Laconia, NH 03246

		<del> </del>		
DATE	STAR	TED	9/19/91 TIME JOB NO.	0878I
DATE	FINIS	HED _	9/19/91 TIME TEST PIT N	10. <u>77-11</u>
CLIE	NT <u>(</u>	ETT G	DOVER - DPW SITE TREATMENT PLANT	STURAGE
•			ION EXCAVATOR DENNES (F)	
	IM	÷	EQUIPMENT BACKHOE	
	:		±4 FT. BGS INSPECTOR MARIE LEDGA.	2 D
(FT,) DEPTH		MOIST.		REMARK
-0-				
			0-6" LOAM W/GRASS ROUTS 6-12" YEL Br., fine - Medium SAND	
				· -
-	:			
-5-		·	1-8' Drk. Gray, fine SAND and SILT Mixed W/msw & CD, few pieces of leather Hides	
-3 -			W/msw & cD, tew pieces of leather Hidas	
	Ā			•
				ur <u>u</u> n in in
:	]:  -			- Original Ground
			8-10' Gray SILT and CLAY	
-10	•	:	END OF TEST POTO 10 FEET	
		2.3	- Photovac TIP MATER PENDTINGS CIPPM	
-15-				1.1
	_			
	1			
	]			

DUNN GEOSCIENCE CORP. TEST BORING / WELL CONSTRUCTION LOG Laconia, N. H. (603) 528-4005 PROJECT DOUER BORING NO. B-1FACTLETY CLIENT OF DOUBR SHEET OF DRILLING CONTRACTOR KENNEDY DRILLING JOB. NO. 08763 PURPOSE MONITORING INSTACHTEON ELEV. GROUNDWATER DATA Casing Sample Core WELL DATUM DATE W.L. HDATE W.L. TYPE HSA 22 STARTED: PVC DIAM Y" ID 21/4" 2" ID COMPLETED: WEIGHT DRILLER 140165 KEUIN KENNED FALL INSPECTOR MARK LEGGARD BLOWS PER 6" WELL IDENTIFICATION CONSTRUCTION REMARKS VOYR 3/2, f-m SAND, few C. sand -13 OPPM TIP MOTER 5-1 f. gravel 13 RUNDING Rec. 10 6" Bricks gravel, ash, rubber fill on Augers 5-5-2 2.57 4/4, f-m SAND W/ clay brick, ASN, OPPM TIP METER 15 READENG Rec. 10 6" 9 5-6' Augers Grinding On Gobbles 544/3-5/1, SILT, little f. sand W/4" Drk illustral accommendate 10-5-3 2 leases of sy 3/2 f. sand, Rec. of organize matter? few silt 2-3" dia. 24" 2 Collected Sample B-1 for laboratory analyses at a depth of 9.8-10,5 5-4 Y" SY4/1, f-c SAND, few sict 15-4 Rec. 9" sys/z, cear, come sict 7 21" 4" 2,5 Y 5/4, f- M SAND 4"2.58 40, SILT, Little Clay END OF BORING @ 16.8 FEET LEGEND: SCREEN: RISER: SAND PACK: BENTONITE: BACKFILL:

PROJ	SCT 7	DUER	DPW	FACE	ELITT				BORING NO. 6
CLIE	IT D	CITY	OF:	Dos	ER			14.4	SHEET ( OF
DKTF	TNG (	CONTRA	CTOR	KENI	1604 I	PRICETA	6	a agricultura de la companya de la c	JOB. NO. 087
PURP	DSE /	PONFTO.	RING	Wec	c Ins	TALLATI	DA	matina an e-minel 1900 objects to account of the St. al. 1222.	ELEV. H.P.
	NDWAT.	EK DA'	'A	did a sea a se	CASING	SAMPLE	CORE	WELL	DATUM
DATE	W.L.	DATE	W.L.	TYPE	1/3/1	25	•	PUC	STARTED: 5/8
				DIA	M Y"ID	21/41		2".ID	COMPLETED: 4
				WEIG		140165		DRILL	ER EGUTH EENNE
			<u> </u>	FAL	<u> </u>	30"		INSPE	CTORMARE LEGGAS
DEPTH FT. SAMPLE NUMBER	BLOWS PER 6"	l .	VELL [RUCT]	ON	ID	ENTIFI (	CATIO		REMARKS
0 5-1	1				GRAVEL F				
-Rec.	2	1997			GRAVEC F	<i>= (</i> (			
1"	-'-								
1								•	
5-5-1	2		1 1	1.4	FILL				OPPM TIP M
Rec.	2				ASH, C	MOGRE, CO	AL, GO	214	READSI THROUGH
8"	2					0 W/10Y			
S-Z Rec.	2				,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	D W/ 101	R 3/6	+ -M 3AA	70
11"	2			1					
5-3	2					• The second se	•		
0 - 11"	2		:						
	4								
5-4	2	:							
5-5	4	1	ļ						
-Rec.	3								
2"		·							
5-5-6	4				<i>''</i> -				
Rec,	Ч П				" FILL " fine San	dy loam (	Top S.	()	
- 22"	13			4	" Mishly I	ECOM POLE	1 rock	· ·	B-2 From ADA
4				E	END OF	BONING	@ 16.	SFEET	0F 14.5-15.5 F
		1.1 1.4 3 - 4.4			and the second of the second				
1 1									

		GEOS( a, N.H.	CONSTR	RUCTION LOG						
P	ROJE	CT De	OVER	DPW	Faci	 liter				BORING NO. MW-1
С	LIENT	r c:	ETY OF		•	1				SHEET I OF I
D	RILLI	NG CON	ITRACTO	IR KEN	WED	Y DRILL	ING-			JOB NO. 08763
P	URPO	SE Moi	NI TORI	NG W	压止	INSTALLA	TIEN			ELEV. MP. GR.
G	ROUN	DWATER			<u> </u>	CASING	SAMPLE	CORE	WELL	DATUM
D	ATE	TIME	DEPTH	CASING	TYPE	HSA	22		PVC	STARTED: 5/6/91
					DIAME		21/4"		Z"ID	COMPLETED: 5/6/91
					WEIGH	IT	HO 165			R KEVIN KENNEDY
					FALI	•	30"			TOR GARRET GRAAGKAN
DEPTH	SAMPLE	BLOWS PER 6"		WELL TRUCTIO	и	ı	DENTIFIC	CATION		REMARKS
	1		cement			4" ASPHALT	-			
	  S-1	10	Quartz			6" 5 8K 4/4-	mac SAN	D. tomes	امسام ۲۰	10" Cubble below
İ	R=09	1/7	Sppm TIP meter							
	(S-1B)		or reading							
	1.6-18									
	1				ŀ					
5 -	5-2 R=1.1	4 5			10	OYR 4/2 - 5/	t, fom s	D PAM TET METER READING NO OFR		
•	K=1)	9								
					7.0'		- FILL *			
			Quartz :							NATURAL
-			send							
10 -	i ,	7 6	·		/	Nottled color	ing	*/ <sub>4</sub>	mer 612	2 THO HEIER
	R =1.7	10	•				ND , UNA			Z ppm TIP MEITR IREADING
		18		워틸레		•	,			No u dor
				1 3 1						
1			١٠.		-					
4				1= 1						
15	5-4	2	AL THE HOUSE							
	R=0.4 2   10 GY 5/2 fm SAND Wet									<pre></pre> <pre>TIP HETER READING</pre>
1	l		l i	, = . 1						SIONO al
	I			惧制制。	7.0		" Flowing Sand "			
	ł		1	, ; , . [						
1	5-5	9	.1							
1	R=01	1 <del>1-</del> 1B			A	s@ 14.5'	w/ trace	+ Grave	el, wet.	Elppm TIP METER
20-		21			B	10.05 = HC				NOODUR

		GEOSC , N.H.	IENCE	CORP		TES	ST BOF	UCTION LOG			
PR	OJE	CT Do	ver I	DPW F	ACI	LI	<b>TY</b>				BORING NO. MW-2
CL	IENT	رع	TY 0	F Dov	ER						SHEET I OF I
DR	HLLI	NG CON	TRACTO	A KEN	NED	Y :	DRILLI	NG			JOB NO. 09763
PU	RPO!	SE MON	UITORI	w ou	ELL	<i>1</i> 2	ISTALLA	TIDN	hade suppose to	2 · · · · · · · · · · · · · · · · · · ·	ELEV. MP. GR.
GR	OUN	DWATER	and the second second				CASING	SAMPLE	CORE	WELL	DATUM
DA	TE	TIME	DEPTH	CASING	TYP	E	HSA	SS	-	PVC	STARTED: 5/6/91
		1.5			DIAM	ETER	4"ID	21/4"		Z"ID	COMPLETED: 5/6/91
					WEI	GHT		140 Lbs		DRILLE	R KEVIN KENNEDY
			1 2 2 2 3		FAI	LL		<i>3</i> 0"		INSPEC	TORGARRET GRANKAMI
0 <b>6</b> 274 Ft.	SAMPLE	BLOWS PER 6"		WELL TRUCTIO	ON .		ı	DENTIFIC	CATION		REMARKS
	S-1 R=1.3	21 49 54 38	<pre> </pre> <pre> </pre> <pre> </pre> <pre> <pre> <pre> <pre> <pre> <pre> </pre> <pre> <pre> <pre> </pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> </pre> <pre> </pre> <pre> </pre> <pre> </pre> <pre> <pr< td=""></pr<></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre>								
1	S-2 R=13	27			7.0'	10	YR 5/4, Damp	tom sv	ND, tra	Ce Grown	FILE  Natural  Zppm TEP METER  READING  NO ODOR
1.	S-3 R=1 <del>1</del>	14	gueste.			101	wet	fmc.S/ dense ed @ a	poorle	nce f Go y surted	WE <zippm meif<br="" tep="">READING NO DDOR</zippm>
15 -		31 62 63 71			17.0	54	Silt	1/6, fm trace =	FILL, NO DOOR perched water on typ of till		
	S-5 R=az'		19.4 10	30H=20.7		10 Y	R 1/2,	FucSAND	, trace for	Growel, we	BEDROCK REFUSA

LEGEND - Screen: Sand: Gravel: Soil Backfill: Bentonite: Cement Grout:

DUNN GEOSCIENCE CORP.  Identify Note Devel Project Dover Devel Factlity  CLIENT CITY OF ROWER  CRIENT CITY OF ROWER  CRIBING CONTRACTOR KENNEDY PRILLING  PURPOSE MONITORING WELL TASTRUCATION  GROUNDWATER  DATE TIME DEPTH CASING TYPE HSA SS — PVC STARTED: 5/6/91  WEIGHT  WEIGHT  140 Ibs — DRILLER KENNEDY  FALL 30" — INSPECTOR GARRET GRASHAM  STEL 21 COMPANY  WEIGHT  140 Ibs — DRILLER KENNEDY  FALL 30" — INSPECTOR GARRET GRASHAM  STEL 21 COMPANY  BONNTRUCTION  IDENTIFICATION  REMARKS  STEL 31 GRAND, INC. © FM Gravel  Grand And  STEL 101 100/031 nobund  TOTAL STALL  STEL AND GRAND, WITHE FM GRAND  STEL 101 100/031 nobund  TOTAL STALL  STELL NATURALL  SO TOPM TEPMETE  READING  STELL NATURALL  SO TOPM TEPMETE  READING  STELL NATURALL  SO TOPM TEPMETE  READING  SO TOPM  TOPMETE  READING  SO TOPMETER  READING  S			·							
CLIENT CITY OF DOVER  DRILLING CONTRACTOR KENNEDY PRILITING  DRILLING CONTRACTOR KENNEDY PRILITING  DRING CONTRACTOR KENNEDY PRILITING  DOB NO. 08763  PURPOSE MONITORINIG WELL INSTACLATION  BELEV. MP. 6R.  GROUNDWATER  DATE TIME DEPTH CASING TYPE HSA SS — P.C. STARTED: 5/6/91  DIAMETER 4"ID 2/4." — 2"ID COMPLETED: 5/6/91  WEIGHT 140 165 — DRILLER KENNEDY  FALL 30" — INSPECTOR GARRET GRASKAM  THAT IN THE SAME SAND, INSPECTOR GARRET GRASKAM  CONSTRUCTION  DENTIFICATION  REMARKS  SI 2 3 3 COMMAND  SYR 1/2 MC SAND, INHE® FM GROUP  FILL  NATURAL  STILL AND CLAY, SHIT, wet  SO I ppm TIP HE  READING  SHOOP TO ANT  REPUSAL AT 6.5  BEDROCK			CE COF	RP.	TES	ST BOF	RING /	WELL	CONST	RUCTION LOG
CLIENT CITY OF DOVER  DRILLING CONTRACTOR KENNEDY PRILLING  UDB NO. 08763  PURPOSE MONITORING WELL INSTACLATION  BAPPLE CORE WELL DATUM  DATE TIME DEPTH CASING TYPE HSA SS — PVC STARTED: 5/6/91  WEIGHT 140 lbs — DRILLER KENNEDY  FALL 30" — INSPECTOR GREET GRASKAM  WEIGHT 140 lbs — DRILLER KENNEDY  FALL 30" — INSPECTOR GREET GRASKAM  THE ROAD AND HALL SAND, HITHE FIRE GRAD CONSTRUCTION  DENTIFICATION  REMARKS  STIL 21 COMMENTED AND SAND, HITHE FIRE GRAD CONSTRUCTION  SYR 1/2 ME SAND, HITHE FIRE GRAD CONSTRUCTION  BEPROCK  STELL AND CLAY, SHIFT, WELL SO I POPM TIP MEE  READING SHOOL AND COOR CONSTRUCTION  BEPROCK  REPUSAL AT 6.5	PROJECT	DOVER	DPW	FA	ILI	TY				BORING NO. MW-Z
PURPOSE MONITORIAGE WELL TUSTALLATION  GROUNDWATER  CASING SAMPLE CORE WELL DATUM  DATE TIME DEPTH CASING TYPE HSA SS — PVC STARTED: 5/6/91  WEIGHT 140 lbs — DRILLER KEVIN KENNEDY  FALL 30" — INSPECTOR GARRET GELEKAM  WELL CONSTRUCTION  IDENTIFICATION  REMARKS  S=1 21 Cemeal ROAD  FOR SAND, trace & fm Gravel Gravel Grant Gravel G	CLIENT	CITY								
PURPOSE MONITORING WELL INSTALLATION  GROUNDWATER  CASING SAMPLE CORE WELL DATUM  DATE TIME DEPTH CASING TYPE HSA SS — PVC STARTED: 5/6/91  WEIGHT JAY 15 — 2"ID COMPLETED: 5/6/91  WEIGHT JAY 15 — DRILLER KEYIN KENNEDY  FALL 30" — INSPECTOR GARRET GRASKAM  TO BE STILL 30" — INSPECTOR GARRET GRASKAM  CONSTRUCTION IDENTIFICATION  REMARKS  SI ALL SOLOMOLOGY  FALL 30" — INSPECTOR GARRET GRASKAM  TO BE STAND, HALL 9 fm Gravel Grask OPOR  FOR SAND, HALL 9 fm Gravel GOLD GAS" OPOR  FELL MATURAL  SYND  SYR 4/2 Mc SAND, little 9 fm Gravel  FILL MATURAL  SYND  SYR 3/2 - 4/2  READING  SYR 3/2 - 4/2  SILLT ONL CLAY, SHIF, wet  BEPROCK  READING  SYDDA  REPARAL AT 6.5  BEPROCK  REPARAL AT 6.5  BEPROCK	DRILLING	CONTRAC	TOR K	ENNE	EDY	PRILLI	NG			JOB NO. 08763
DATE TIME DEPTH CASING TYPE HSA 5S — P/C STARTED: 5/6/91  DIAMETER 4"TD 2/4" — 2"TD COMPLETED: 5/6/91  WEIGHT HO 165 — DRILLER KENTU KENNEDY  FALL 30" — INSPECTOR GARRET GRASKAM  TOYK 5/4 to 3/2  FR.CO.  ST. 1  ALL COMSTRUCTION  IDENTIFICATION  REMARKS  SOLOPH TEPMENE  READING  "OLD 646" OPOR  TOR SAND, INCL. FM Gravel  And Gravel  STR 4/2 Mc SAND, little Fm Gravel  FILL  NATURAL  STLT and CLAY, shift, wet  SOLOPH TEPMENE  READING  "OLD 646" OPOR  TOWN THE ME  READING  STR 3/2 - 4/2  STLT and CLAY, shift, wet  SOLOPH TEPMENE  READING  Strong "OLD 645"  ODOR  REFUSAL AT 6.5  REPUSAL AT 6.5  REDROCK	PURPOSE	MONITO	RING	WEL	L I	USTALLA	TION			
DATE TIME DEPTH CASING TYPE HSA SS — PVC STARTED: 5/6/91  DIAMETER 4"ID 21/4" — 2"ID COMPLETE: 5/6/91  WEIGHT 140 165 — DRILLER KEYIN KENNEDY  FALL 30" — INSPECTOR GARRET GRUSKM  WELL CONSTRUCTION  DENTIFICATION  REMARKS  ST. 1  A. 24  SS. — PVC STARTED: 5/6/91  COMPLETE: 5/6/91  DENTIFICATION  REMARKS  TOTAL SAND, Have 9 fm Grouel drug  SYN 3/2 - 4/2 mc SAND, little 9 fm Grouel Solopon Tipheje  READING  SYR 4/2 mc SAND, little 9 fm Grouel  SYN 3/2 - 4/2  SILT and CLAY, shift, wet  SO I ppm Tipheje  READING  "OLD GAS" OPOR  red brick piec  SYR 3/2 - 4/2  SILT and CLAY, shift, wet  SO I ppm Tipheje  READING  Shong "old GAS"  ODOR  REFUSAL AT 6.5  REPUSAL AT 6.5	***************************************					r	<u> </u>	CORE	WELL	<u> </u>
DIAMETER 4"ID 24" - 2"ID COMPLETED: 5/6/71  WEIGHT 140 165 - DRILLER KEVIN KENNEDT  FALL 30" - INSPECTOR GARRET GRASKAM  WELL 30" - INSPECTOR GARRET GRASKAM  REMARKS  S=1 21	DATE TIM	E DEPT	H CASIN	G T	YPE	HSA	SS		PVC	
WEIGHT 140 165 - DRILLER KENTAL KENNUEDY  FALL 30" - INSPECTOR GARRET GRASKAM  WELL CONSTRUCTION IDENTIFICATION REMARKS  S=1 21				DIA	METER	4"ID	21/4 "	_	2" ID	
FALL 30" — INSPECTOR GARRET GRASKAM  WELL CONSTRUCTION  IDENTIFICATION  REMARKS  S=1 21 R=09 24  Dentation  Dentation  S=2 3 R=10 100/0.5 nebwel  REMARKS  FALL 30" — INSPECTOR GARRET GRASKAM  IDENTIFICATION  REMARKS  Sot ppm TIPMETE READING  TOLD GAS" ODOR  FILL  NATURAL  STLT and CLAY, shift, wet  READING  Strong "OLD GAS"  ODOR  REMARKS  REMARKS  TO JOYR 5/4 to 3/2  fmc SAND, thice \$\theta\$ fm Growel  Gravel  Gravel  READING  TOLD GAS"  FILL  NATURAL  SO \$\theta\$ piec  STLT and CLAY, shift, wet  READING  Strong "OLD GAS"  ODOR  REPARTING  STRONG "OLD GAS"  ODOR				WI	EIGHT					
WELL CONSTRUCTION IDENTIFICATION  REMARKS    Second   28				F	ALL			_		
FILL  READING  STR 1/2 Mc SAND, thice of find Grave 1  STR 1/2 Mc SAND, little	SAMPLE NUMBER BLOWS	E CON		TION		11	DENTIFIC	CATION		· a.
	S=2 3 R=1.0 100/0	guents sound ben bons went to sound			5 4 541 8	FMC 6A  dry  R 4/2  R 3/2  STLT  EDROCK  = 6.5'	MC SAA	mil 'ar	e⊕fm G	FILL NATURAL  50 + ppm TIP ME  READING  Strong "OLD GAS  ODOR  REFUSAL AT 6.5

	Project	D	· · · · · ·		7	DPW	- RI PET				Boring	g #	<i>\\\\</i> 1	J-3	A	
,		7	TY.	5	_	JOUER					Sheet	<u>:</u> of				il.
,	Client Contract		11			2146		Date Begu	un 4	4/96	Overb	urde	n Drille	ed /	<del>7</del> '	] [
7	Method :	AUSF					o i cino	Completed	d a)	1/96	Rock [		M 1000 C 1000 C	· · · · · · · · · · · · · · · · · · ·		1
]	Ground E						PID (".724)	Protection	1 Leve	I D	<del></del> <del>S</del> <u>B</u> <sub>B</sub>	wole	Grour	id /	5.5'	4
an respec	Logged I	Зу	Cu	5		prominent organization and an exercise or the second or th	Checked By	Date			Site	Do	ひちれ	DPW		1
		PID Amblent Air	Sample #	Sample Interval	Poc	Jar-Headspace (ppm)			Lithologic Symbol	Well Con	struction		or RC	/6 in.	evation (ft)	rin macetivener parties
-	) Depth (ft)	P10 /	Sam	San	Rec Pen		Soll/Rock De		5	27.61	T <sub>2</sub> .	1		30 80 11	Po ≟	16
			To the second se		1/2 15/2 2/2	0,0	SINO, NO DOOK  SINO, NO DOOK  SINO, NO DOOK  SINO NO SOSK  SINO NO DOOK  10-10-5: DAR'S BROWN SILTY FO  DETTMISHIN DONK  SINO W SOME UDON  10.5-12.0: SKEY BROWN SILTY  LUTY  STUMPT SOME ROCK TO  C TOTAL DEPTH  EOB @ 17.0'			8			7/P	4/3 /4/2 /34/3 /34/3		
	3 -	=										-				-
	NO <sup>-</sup>		G	15	,0'	w 177	CEDITION OF MW-3F H 10' SCHETCH (2"D	CASW	/ELI	, EIC	E I	& I	HILL	, INC	EERIN	<b>7G</b>
<u>.</u>							GEOL	OGY HYD	KUG]	LULUG	I GEU	LUI	3163	E11GII1	LEFUN	, 5

T	NUN	GEOS	CIENC	E CORI	P.								
	Lacon	la, H. H	. (603)	528-4005		EST BOR	RING /	WELL	CONST	'RUCT	NOI	LÒG	
	PROJ	ECT =	DOVER	2 D7	الما	FACILIT				-			
			ITY O	F Do	UER	/				SHEE	BORING NO. MW.		
	DRIL	LING	CONTRA	CTOR		HEDY -	Derur	~			SHEET / OF / JOB. NO. 0876:		
	PURP	ELEV	H.	• 0876: P.   GR.									
	GROU	ļ	DATUM										
D	ATE	W.L.	DATE	W.L.	TYPE	HSA	SAMPLE SS		HELL PVC	<del> </del>		-77	
					DIAH		21/4"		2"ID			: 5/7/91	
. L					HEIGI	T _ Ti	140163	_		ER /	DE I	ED: 5/7/	
					FALL		. 30"	-	INSPEC	TOP 4	ITM	KENNET	
E	. 23	2 6	h	ELL			30		THOUBE	TOK III	PRK	LEDKARD	
DEPTH	1 -	BLOW	CONST	RUCTI	ON	IDE	NTIFI	CATIO	4	F	REMA	RKS	
0		5			2'	GRASS AND	1 POOTS				<del></del>		
	S-1 Rec.	4	-23		18	" 584/1, t	-m 5A	ND, LiHL	sile				
	- 20"	3	٤				lass, woo	J	-	1.41	PPM	TIP MOTE READING	
			1										
										l			
	1		1 '										
5.	5-2	2.	١			,							
	Rec.	12		\[\bar{\bar{\bar{\bar{\bar{\bar{\bar{		"							
]	24"	12	,	·   1	6	" <u>SAME</u> " SY S/2	T CANE			-1.			
	ł		1	,[]	"	3, 2, 2	T. SAND	7, Tew 5	· 27	1.0 7	PM 7	TP MEIBR READING	
			- 1	计局	ı								
								·					
			i.	, []									
10-	5-3	2	);	上(:1				•					
	Rec.	8	/ .	3-10	u.	1 1				. ]			
	12"	6	1.		W	d, glass, po f. SANDan	yer fill j 1 silt	organi	e Matter,	15.97		TEP MATS. READENG	
4				1-1.1						_	•		
				;[- :]	1/5	ATHER / HX	D54			40.50	A	- 1	
	5-4	15		1	"	11/1/2/2///	DES				60 1 <b>5</b>	ering 1	
1	Rec,	19								1			
16-		23	1400	8						ı			
			I	1	EN	OF BORS	ING @	IS FEE	= <del></del>	1			
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-	1												
	- 1												
1	f												
				<u>l</u>		<del></del>				i			
	I.E	GEND: S	CREEN:	# RISER	: !!!!!	ሪሃክቦ ይሃርዩ	e fillion	ግዛተለዛተተካ			6,0		

DUNN GEOSCIENCE CORP. TEST BORING / WELL CONSTRUCTION LOG Laconia, N. H. (603) 528-4005 PROJECT DOJER DPW. FACILITY BORING NO.M CLIENT CITY OF DOUER SHEET / OF DRILLING CONTRACTOR KENNEDY DRILLING JOB. NO. 0876 PURPOSE MONITORING WELL FRETALLATION ELEV. GROUNDWATER DATA CASING SAMPLE CORE HELL DATUM DATE W.L. DATE W.L. TYPE HSA 55 STARTED: 5/7/ PVC DIAH 2/4" Y"ID 2"ID COMPLETED: 5/24 HEIGHT DRILLER KEVIN KENNE 140161 FALL INSPECTOR MARK GEOGRAP 30" BLOWS PER 6" WELL CONSTRUCTION **IDENTIFICATION** REMARKS 28 CEMENT 2.57 6/2, f-M SAND, few C. sand-5-1 O PPM TIP MET 25 f, gravel READING Rec. 23 12" 23 Black, f-m SAND, few sice, few C. Sand Augers SAMPLE 5-2 Azers 543/2, f. SAND, illouin I Black organie 5-3 Rec. OPPM TIP METS Muteles (4" dia.) 24" READING 12" SY 5/1, f. SAND, few sice 10-15-4 10" 546/1, f. SAND, few silt 2 Rec. TEP META READENG OPPM 10" 574/2, f. SAND, few sice, D.O.M 20" 15-15-5 2.57 5/0, CLAY, few sict OPPM TIPMSTE Rec. READING 24" END OF BORING @ 16,5 FEET SAND PACK LEGEND: SCREEN: RISER: PACKETIT .

BENTONITE:

DI	DUNN GEOSCIENCE CORP.  Laconia, N. H. (601) 528-4005  TEST BORING / WELL CONSTRUCTION LOG											
			(603) 5			REAL BOR	LING /	WELL	CONST	RUCTION LOG		
					, I	CILITY				BORING NO		
Ci	JIE					CICITY				BORING NO. MW-6		
			COMMP A	CHOR	VER					SHEET / OF /		
-	(LII)	nTMQ (	CONTRA	CTOR	KBUII	Y KENN	EDY			JOB. NO. 08763		
Pl	JRP	OSE M	ONITOR	ING W.	su I	MSTALL A	TION			ELEV. H.P. GR.		
G	ROU	NDWAT	ER DAT	Γ <b>λ</b>	<u> </u>				DATUM			
DA	TE	W.L.	DATE	W.L.	TYPE	HSA	55		PVC	STARTED: 5/7/91		
					DIAH		21/4"			COMPLETED: 5/7/9		
					WEIGH		140165		DRILLE	R /a= /a		
					FALL			4	THEBRO	R KEUIN KENNEDY		
-	N ~	T		1811			30"		INSPEC	TOR MARK LEPGARD		
DEPTH FT.	19 L	8 6	1	VELL		the	7 & 2 PT T 20 + .	7				
061	SAMPLE	BLOW	CONST	RUCTI	.ON	100	ENTIFI	CATIO	A	REMARKS		
0		9	CEMBAT	, , , , , , , , , , , , , , , , , , ,		" ~~ ~/.	C =4 C44	<b>D</b> C-	m	,		
-	5-1 Rec.	6	~2,			" 5 x 3/1, t	glass, bri	r, tew .	M-C Sand	1.0 PPM TIP METER READING		
	20"	6	ŀ		14	" sr3/1 f	SAND	few sice	ŧ	KANDING		
1						•	•			Fillinend of spoon subber, paper, leather		
								•				
1						•						
5 -	5-2	4		·:}- '*/				· · · · · · · · · · · · · · · · · · ·		270 PPM TIP METER		
	Rec.	5			5	r 3/1, f-	M SANI	s, little s	ict	READING STRANG GAS ODOR		
-	20"	2				• •				NET AT S'		
			:									
1			į									
1								*				
4			-									
	<b>5</b> -3	14	4			122/2 C	M CAND		415	SUPPM TIP METER		
10-1	Rec.	40	ſ.	* P.	2,3	54 2/0, f- cri	III SAND ISHKO ST	one i	aik,	READING		
	6"	12								STRONG GAS ODOR		
ŀ		_!'	<u>-</u>									
1				1	.   6	ND OF	BORING	c (d )/.s	FEET			
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l				1								
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	·											
	LE	GEND:	SCREEN:	RISE	R:	SAND PAC	K:	вентоніт	E: B	ACKFILL:		
					11111		127.74		- parting 19	THE THE PARTY OF T		

DUNN GEOSCIENCE CORP. TEST BORING / WELL CONSTRUCTION LOG Laconia, N. H. (603) 528-4005 PROJECT DOVER DPW FACTCITY BORING NO.MO CLIENT CITT OF DOUBR SHEET 1 OF / DRILLING CONTRACTOR KENNEDY PRILLING NO. 0876 JOB. PURPOSE MONITORING WELL INSTALLATION H.P. ELEV. GROUNDWATER DATA CASING SAMPLE CORE HELL DATUM DATE DATE W.L. W.L. TYPE HSA. STARTED: 5/8/9 25 PUC DIAM Y"ID 7/4" COMPLETED: 5/8/ 2"ID WEIGHT DRILLER KEVIN KENN IYObs FALL INSPECTOR MARK LEDGARD 3011 SAMPLE 9 20 WELL ĒĖ BLOW CONSTRUCTION **IDENTIFICATION** REMARKS 3" ASPHALT COMENT 5-1 54 6" 10 YR 3/2, f-C SAND, few C. scavel I PPM TIP METER 44 Rec. 6" IOYR S/6, F-C SAND, feu C. gravel READING 12" 30 BLACK, f-M SAND, few C. gravel 5-2 Auger SAMPLE 5-3 5 -2" 2.5 Y 3/4, fine SAND 4 Rec. O.S PPM TIP MI 4" SY 4/2, ASH FILL, CIMBARS W/ 8" READEN 4 5-4 3 SYS/2, SYS/4, fine SAND, little sice 10 -3 Rec. O. SPPM TIP MOTE 19" READING 2 6" SYY/1, f-C SAND , CRURHED STONE 15-1 5-5 20 Rec. O.S PPM TIP METS 17 6" IOYR 4/6, f-C SAND, few f. gravel 14" READING 18 END OF BURING @ 16.5 FEET SAND PACK LEGEND: RISER: BENTONITE:

DUNN GEOSCIENCE CORP. TEST BORING / WELL CONSTRUCTION LOG Laconia, N. H. (603) 528-4005 PROJECT DOVER DPW FALILITY BORING NO. MW-CLIENT CITY OF DOVER SHEET | OF | DRILLING CONTRACTOR KENNEDY DRILLING JOB. NO. 0876. PURPOSE MONETONING ELEV. H.P. WELL INSTALLATION GROUNDWATER DATA CASING SAMPLE CORE HELL DATUM DATE W.L. DATE W.L. TYPE STARTED: 5/8/91 HSA 55 PVC DIAH Y"ID 7/4" 2"ID COMPLETED: 5/8/ WEIGHT DRILLER KEUIN KENNED? 140165 INSPECTOR MARK LEOCARD FALL 30" BLOWS PER 6" WELL DEPTH FT. **CONSTRUCTION IDENTIFICATION** REMARKS 5-1 2.57 5/6, f-C SAND and GRAVEL OPPM TIP METER Rec. REHDING 6" 3.5' CLAY ON AUGERS 5-15-2 2.57 5/3, 2.57 5/4, CLAY OPPM TIP MOTER 2 Rec. REHDENG 3 241 10-218" 2.54 S/O CLAY W/LAST 5-3 OPPM TIP METER 6" IOTR 4/6, fine SAND lenses (1/8") READENS Rec, 24" END OF BATHE @ 11,8 FEET SCREEN DIEER. 6.00

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Project	$\mathbb{C}$	いん	<u>r</u>	5	- St	- W	FI	PET				Bor	ing #	1/1 1	· W ·	- &A	
Client	اک		ક		Sove								et' (				
Contract	or	HH	,	2	46	-			Date Beg		,				rillec	1 (0	2'
Method:		er /	52	· S	Pash!	Casing	Size		Complete	d d	15/9%	A	191				
Ground				<u></u>		PIDH	SIZE IU -PI- (11-7)	-101 ev)	Protection	n Lev	el				ound		0.0
Logged	Ву	Angel in process passes	cv	WI	ani an - 2 ni quietro presentati "ci	on to write the contraction of	ced By		Date			Site	<u>.</u> []	<u>\~</u>	4-	Con	
Depth (II)	PID Ambient Air	Sample #	Sample Interval	Rec Pen	Jar-Headspace (ppm)				escription	Lithologic Symbol	Well Co	nstructi		C	SPT Blows/for RQD	6 ln.	Elevation (ft)
2 4	S:	9	<b>X</b>	15/2 F/2 F/2	5	2000 - 10	Screens	FIRE INCO STATE	STAID ! PLOCE			+ 等		11	7. V2	1:/:	
				-							C	E .	H				
								GEOL	CASV	VELI ROG	L, EIC	CHLE GY GE	ER &	k HI	LL,	INC. ngine	ERING

C. J

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Project GUFER ST	OFW-RZ PRET			i i	1111-9	
Client OT of Dover		r		Sheet_/		
Contractor NH Boring		Date Begun			den Drilled 7:	
	Casing Size Completed * 5 130		25170	Rock Drilled		
Ground Elevation	PID (11-2ev) Protection Level			Below Ground 0.3'		
Logged By CMT	Checked By	Date		Site T	Dover OPW	
Jepth (It)  Jo Ambient Air  Sample #  Sample Interval  Sample Jar  Jar-Headspace (ppm)	Soil/Rock De		Well Cons	struction 0	SPT (#)  Blows/6 in.  or RQD % (#)  20 40 60 80 100 (#)	
2 20	stand fixe medium sand contrel and selbanics	u some	1 / M	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	2/5/7/6 	
4—	· .		1/8 1/8 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	3 //1.		
6 N 1.5 6.0	3" supplied flug South This stat State clay Supplied State Supplied State				1/1/2/4/2-	
43 <del>- 17</del>	S SEEN CLAYEY SILT		- 9 =			
	3" GREY SHOW CLAYEY SINGS 1.5" SATURATED GREY FINES SAND WI SLUT		新河		13/3	
ر اس	4" GLEY SMOI SILT 6" CHEY CLAY					
12/21 22	GIEN SMULATED CL	~				
	EOB @ 17.0'					
NOTES: Conscara Nesta	10, ROBERY (Sust	)				
- Secured wit-	ROPE SON		= $=$	<del></del>		
				EH		
	GEOLO	CASWEI	LL, EICH GEOLOGY	LER &	HILL, INC. YSICS ENGINEERING	

	Project 2	i lier	ST DA	W-RI/PET			Boring #	MW-10	
_ r		TY &	Dove		*	1 1	Sheet / o		
J	Contractor		Bound		Date Begun		Overburden Drilled 10'		
,	Method . Huos	en Ispu	17 Spoon	Casing Size Completed 1/5/4/2			Rock Drilled		
]	Ground Eleva	tion						w Ground 3.5	
,[	Logged By	em		Checked By	Date		Site 💭	DOURL DPW.	
	Depth (ft)	Sample # Sample Interval	স  ত  ar-Headspace (ppm)		Secription	Well Cons	struction	SPT (E) Blows/6 In. or RQD % 09 20 40 60 80 100 80	
J	Depth (ft)	Sample #	Rec à	Soil/Rock De	escription	-	0	20 40 60 80 100 <u>*</u>	
	0	W410 X	20 1/2 20 1/2 2	0-21 GREY FILL 2-3' No Becovery 3-3.5' Brown Madius 3.5-4.0 Grey sit w 2 AND SOIL STRIMATE G	sel Fransis	, ( =		3/12/11/13	
	2 00 milion		2½ 5D	Stel Brown Chul &	·ME	Jaco Corr		2/42/19/16	
	ر ساسیاسیاسیاسیاسیاسیاسیاسیا			€08G 10,					
	NOTES:	0	0 016	COMO BOY					
			* • * •				EH		
				GEOL	CASWE	LL, EIC ogeolog	HLER &	t HILL, INC. Tysics engineering	

a ,	Project		) )	Fort	<	57. 7	FW - (I PET				Boring	# 11-W-11		
* **			<del>~~</del> ~	2		Davel	R_				•	_ of		
10	Client Contract		<u>и</u> Н		B	1112 b		Date Begi	un 🔨	1590	Overb	Overburden Drilled 13 1		
										0 19:0	Rock Drilled			
,	Ground E				<u>*</u>		PID (11-7 <1)	Protection Level D		■ Below Ground 8.0				
	Logged E			<u>ー</u>	7		Checked By	Date			Site	Doven DPW.		
	Depth (it)	PID Amblent Alr	Sample #	Sample Interval		Jar-Headspace (ppm)	Soll/Rock De		Lithologic Symbol	Well Cor	nstruction	SPT (2)  Blows/6 in. (2)  O RQD % (2)  0 20 40 60 80 100 (2)		
	2 4 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	0			5/2	8	5.2.0: The Her court  Sithwith  SUBHT DEUM  STAIN WE STAINS  STAIN WE STAINS  STAIN WE SOTTOM  SILT @ BOTTOM  6.0-6-2: Brown Fine of	o strin	٠.			72/23/15/10		
			11-MM		1/2	20	SATURATED GREY SILL WIRD BORCE FROMENTS	cost Trusts	<b>&gt;</b> )(0)	726 25		8/7/5/3		
	NOT		G	13	, 0,	<i>ن ا؟ -</i>	LATION OF MW-11 10' SURRRY (4"0=) LOCA BOX		-	C	) E F	<u> </u>		
1							GEOLO	CASW	ELL roge	, EIC	HLER y geoi	& HILL, INC. PHYSICS ENGINEERING		

Project RIVER STREET	DOW - RI	PET		Boring #	MW-12
Client CITY of I	DOVER			Sheet <u>f</u> o	1 1
Contractor NH BORING		Date Begun 5	21 97	Overburd	en Drilled 151
	Casing Size	Completed 5/	21/97	Rock Drill	ed
Ground Elevation	PID (11.7 eV)	Protection Lev	rel >	Below Ground 6-00	
Logged By CMT	Checked By	Date	parja da ning <b>spi</b> ngpa ujarah menambian maj g	Site Do	OVER DPW
Depth (It)  PID Amblent Atr Sample Interval  Sample Interval  Depth (It)  Sample Interval  Sample Interval  Sample Interval  A   A   A    Depth (It)	SOII/ROCK DE O-2" ASPHALT 2-5" CLEAN GLEY FINE SA 5-7" DK BN FIM SHOF B 2-15" BN FIM SILTY SA	ND PANEL	1 / / 94	1000 100 100 100 100 100 100 100 100 10	SPT Blows/6 in. or RQD % OII 8 20 40 60 80 100 W
3 - 30	15-16" LT BH FIM. SAND 14-20" STONE (1.5" DIA) 0-2" DL BH FIM SAND 2-3" GREY CLAY WINT SHE SAND 3-24" GREY CLAY	1 SEAUEL B	PAEK &		B/15/7///_
18 18 18 6.0	0-24" GREY CLAY 5-10"/13-24" MOIST L 0-3" GREY SILTY CLAY 3-9" GREY CLAY (MOIST   SE 9-14" GIBN SILTY CLAY WI 14-16" MIST GREY CLAY WITTER 16-20" GREY CLAY SOME SILT 20-24" BN F/C GRAY LIT 0-16" F/M/C GENERL L 16-72 LT BN F/M SILTY SE 72-24" WEATFERST PROCE EOB. C 17' - REF	SET)  Redic FRAGS  EL TILL  (Some TILL  ILL)  TILL)  (10, 222 FARES	F. SAND, F		77/15/17/2 24/28/46/46
NOTES: COMPLETED NIST  - SECURED WITH	10' of SCREEN (2		CI	——————————————————————————————————————	
	GEOL	CASWELL	L, EICH	ILER &	HILL, INC. YSICS ENGINEERING

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Project Plus	EX STIGE	F DFW-RI	/FET		Boring #	MW-13	
	of Dover				Sheet_ c		
Contractor NH	BORNS		Date Begu	n=2:92	Overburd	en Drilled 🖊 🗢 🔭	
Method- Aviser / Se			Completed		Rock Drilled		
Ground Elevation		PID (Maer) Protection Level 1				w Ground 5.23	
Logged By 21/-		Checked By	Date		Site	5745 DDVJ	
Depth (ft) PID Amblent Air Sample # Sample Interval	a a a a a a a a a a a a a a a a a a a	Soil/Rock De		Well Cons	0	SPT (1)  8lows/6 in. (2)  or RQD % (2)  20 40 60 80 100 (2)	
2 A A S S S S S S S S S S S S S S S S S	20/32 20.4 20/32 20.4 20/32 20.4	DEEN = IN SAND  THE STAND STAND  STAND STAND STAND STAND  THE STAND STAND STAND STAND STAND STAND STAND  THE STAND		Age /			
3 1	0 2 0 5	PUFFIC OF MW-1 1 DISER 121 DIST 2012 DIST 2012 DIST 2013					
	•	<b>G</b> EOLO	CASWE	CE ELL, EICH OGEOLOGY	LER & I	HILL, INC.	

# JACQUES WHITFORD COMPANY, INC

27 Congress Street Portsmouth, NH 03801

ject:				V, Dover N	H				Par	ge I of I
ent:	100000000000000000000000000000000000000	City of								J- + Y4 4
ntractor:		Great W		Casing S	ize:		NA	Boring #.		MW-14
lling Meth		41/4 H.		PID:	namen principal de l'annoca n'illino en canton de canton	a materia sur e e ta came e con materiales	Microtip	Date Begun:		02/23/99
and Eleva	tion:		(Local)	Checked			NA	Completed:		02/23/99
ged By:	·	DAG .		Protectio	n Level:		D	Depth to Water:		4.5 ft bls
Sample Interval	Sample No.	Rec/Pen	Standar		on Test (b		*	ption	Soil Classification	Well Construction Details
<del></del>	· ·	16/01		6" - 12"	<del></del>	18" - 24"	<u> </u>			
0 - 2	S - 1	16/24	34	34	37	39	dry, very dense, dark bro			
+ 2 4	C 2	12 / 24	25	ļ			little f-m Gravel, trace !			
2 - 4	3-2	13 / 24	25	15	13	13	dry,m-dense,brown,f-c	SAND, trace		
4-6	C 2	10 / 24	7		ļ		f-m Gravel, trace Silt			
+-0	3-3	10 / 24		3	2	4	wet,loose,dark brown to			
6-8	S - 4	9/24	5	6		10	some Silt, trace f-m Gra			
1	3-7	2124	<u> </u>	0	7	12	wet,m-dense,dark brown		SILTY	
8 - 10	S - 5	10 / 24	6	4	14		little f-m Gravel, trace S	Silt	SAND	
1 10	5 5	20127		4	14	15	simliar to above			
10 - 12	S-6	8/24	3	7	6	6	wet,m-dense,olive brown	o f on CANTO		
							little Silt, trace f-m Grav			
446							BOB at 12 fe			
							DOD at 12 10	Ct DLS		
							•		ŀ	
			4.							
		was de faire	1			***				
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The second second	$\dashv$								1	
					L					
en en		2"-10 slot 2"- PVC Washed S Bentonite I Stand Pipe	and Pellets	12 - 2' 2 - +3' 12 - 1' 1 - 0'		A 11	NOTES: l=Installed a upon complet		g well at 12	ft BLS
ે સમૃત્યું કુનુ કુનું સમૃત્યું કુનુ							<u> </u>			

# GRANITE STATE EXPLORATIONS

DNEY R. ADAMS, c. p. g.

;CT:	STP Additions	LOCATION: Dover,	N. H.		Mill the water than the same of the same	
No.	A-5 Started: 11-22	2-76 Completed: 11-23-7	76	Driller: Ad	ams b	lows/ft
Contraction of the Contraction o	OPERATIONS	MATERIALS CLASSIFICATION	Blows Per Ft. Spoon	Sample No.	Sample Range	****
ħ	Drove 1½" I.D. X 5 ft. solid type sampler 0.0	Silt, Clay, Sand, Gravel and Wood Fill	10			
- deligible	to 5.0 ft.		18			
48	Drove BX FC casomg tp		9			т.
	5 ft. and washed out.		12			
, O_			11		-	
	Drove 1½" I.D. X 2 ft. split type sampler 5.0	Brown changing to gray, fine to medium SAND (SP)	1	S-1	5.0 to	
'.O_	to 7.0 ft.	wet	6		7.0	
12   12   12   12   12   12   12   12	Advanced casing to 10 ft	5.				17
d	and washed out.					16
. 0_				<u> </u>		16
1	Drove $1\frac{1}{2}$ " I.D. X 2 ft. split type sampler. 10.0		5	S-2	10.0 to	
· 0_	to 12.0 ft.		8		12.0	
16 11	Arounced casing to 15'					15
. O_	and washed out.					50
. 0_		Gray, soft, CLAY (CL), wet	pre .			14
	Drove $1\frac{1}{2}$ " I.D. X 2 ft. split type sampler 15.0		1	S <b>-3</b>	15.0 to	
°•0	to 17.0 ft.		.2	! : !	17.0	٠
30" mer 1 c	Penetration of samplers fall of 140 lb. drive , and of casing by 18" of 300 lb. drive hammer. vs = weight of hammer  AND ROCK CLASSIFIED IN FIELD WITH-	11-23-76 - 7:00 AM - casi wate 11-23-76 - 2:30 PM - help	ole reing pui er @ 2 er pui ocked	moval - lled bac .6 ft.	water ck to 3	@ 11.9' O ft.
	ATORY ANALYSIS.	LOG COMPILED BY: KHOWA	us			

## GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c. p. g.

g No.	A-5 Started:	Completed:	- · · · · · · · · · · · · · · · · · · ·	Oriller:		blows
7.0	OPERATIONS	MATERIALS CLASSIFICATION	Blows Per Ft. Spoon	Sample No.	Sample Range	Casi * Keco
.0	Advanced casing to 20 ft					13
	washed, by mistake, to 22.0 ft.					12
.0	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1					13
-	Washed with carbide bit	•				24
						19
.0_	Drove 11 " I?D. X 2 ft.		0		22.0	19
	pplit type sampler 22.0 to 24.0 ft.			S-4	to 24.0	<del></del>
.0_	Advanced casing to 25'		0			19
.0_	and washed out.					-16
• ~	Drove 12" I.D. X 2 ft.		0	S <b>-</b> 5	25.0	
	split type sampler 25.0 to 27.0 ft.			5-5	27.0	
.0_			0			
	Advanced casing to 30'	4 *				23
	and wshed out.					23
			•			19
.0_	Drove 1½" I.D. X 2 ft.				30.0	\ <u>-</u>
	split type sampler 30.0		0	s <b>-</b> 6	to 31.4	
.4_	to 32.0 ft.	Gray, loose, CLAY (CL)	<u>0</u> 8	S-7	31.4	to 32
• ~_		with thin Sand layers and				23
	Advanced casing to 35° and washed out.	occassional Gravel, wet				40
					a designation of the second	42
.0_						39
	Drove $1\frac{1}{2}$ " I.D. X 2 ft. split type sampler 35.0	Gray, loose, gravelly, medium and fine SAND (SP)	24			
Ω	to 37.0 ft. No sample recovered.	wet we make the second second	28			
• •				Ţ		

## GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c. p. g.

JECT:	STP	Additions	LOCATION: Dover, N. H.								
ng No.	A-5	Storted:	·Completed:	Driller:							
PTH 7 • 0		OPERATIONS .	MATERIALS CLASSIFICATION	Blows Per Ft. Sample Spoon No.	Sample Range	% Cor Recove					
	solid	1½" I.D. X 5 ft. type sampler 35.0 .0 ft.	(see page 2)	23 S-8 17 20	35.0 to 40.0						
0.0	solid	1½" I.D. X 5 ft. type sampler 40.0 .0 ft.		13 17 45 170	40.0 to 45.0						
5.0 <u>.</u> 7.5 <u>.</u>	solid to 47 100 b	1½" I.D. X 5 ft. type sampler 45.0 .5 ft Refusal lows/no penetration m of Exploration refusal er instructions		57 43 50 200	45.0 to 47.5						
		·									

## GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c. p. g.

ing No.	A-6 modified Started: 12-9-	76 Completed: 12-10-76		Driller: Ada	ams	
EPTH	OPERATIONS	MATERIALS CLASSIFICATION	Blows Per Ft. Spoon	Sample No.	Sample Range	% Cor Recove
1.0_	Drivided with 3" flite augers to 5 ft.	Dark brown, Topsoil				
	1000 lbs. bit weight used	Brown, loose, silty, gravelly, SAND (SP-SM), barely moist to wet below 8'+				4
		Fill				
5.0_ 7.0_	Drove 1½" I.D. X 2 ft. split type sampler 5.0 to 7.0 ft.		2 4	S <b>-1</b>	5.0 to 7.0	all of sampl
	Drilled with 3" flite augers to 10'	no gravel in material				
0.0 <u> </u>	Drove 1½" I.D. X 2 ft. split type sampler 10.0 to 12.0 ft.		5	S <b>-</b> 2	10.0 to 12.0	
	Drilled with 3" flite augers to 15'					
5.0 <u> </u>	Drove $1\frac{1}{2}$ " I.D. X 2 ft. split type sampler 15.0 to 17.0 ft.	Gray, loose, SAND (SP), wet with wood in sample	0 4	S <b>-</b> 3	15.0 to 17.0	
y 30' ammei f 30'	Penetration of samplers " fall of 140 lb. drive r, of casing by 18" fall 0 lb. drive hammer. ws = weight of hammer	GROUND WATER READINGS:  12-10-76 8:00AM Csg. @ 12-10-76 11:10AM 15 min.  12-14-76 12:55PM Water a	. after Wa	r last ater at	sample	
	AND ROCK CLASSIFIED IN FIELD WITH-	LOG COMPILED BY: RAM	lans			•••

## GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c. p. g.

	STP Additions	LOCATION: Dover,				
g No.	A-6 modified Started:	Completed:		Driller:		blows/i
тн '•О	OPERATIONS	MATERIALS CLASSIFICATION	Blows Per Ft. Spoon	Sample No.	Sample Range	Casing ************************************
	Set EX FC casing to 15' and rove to 20' and					7
	washed out.	a.				. 11
. 0_						14
	Drove $1\frac{1}{2}$ " I.D. X 2 ft. split type sampler 20.0 to 22.0 ft.	Gray, soft, CLAY (CL), wet	0	S-4	20.0 to 22.0	
.0	Advanced casing to 25'					12
	and washed out.					12
0						13
O	Drove 1½" I.D. X 2 ft. split type sampler 25.0 to 27.0 ft.		0	S-5	25.0 to 27.0	
	Advanced casing to 30° and washed out.					20
0						17
0_	Drove $1\frac{1}{2}$ " I.9. X 2 ft. split type sampler 30.0 to 32.0 ft.		0	s <b>-</b> 6	30.0 to 32.0	
Ī	Advanced casing to 35' and washed out.					17
0			1 1111111111111111111111111111111111111	Transfer in the Long age of		15
	Drove 1½" I.D. X 2 ft. split type sampler 35.0 to 37.0 ft.		0	S-7	35.0 to 37.0	
0	- The state of the			•		17
Ţ	Advanced casing to 40° and washed out.					22
0_						20

#### GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c. p. g.

JECT:	STP Additions	LOCATION: Dover	, N. H.		THE REAL PROPERTY AND ALL STREET, LINGSON, LAND AND	
ng No. ,	A-6 modified Started:	Completed:	D	riller:		
PTH 0.0	OPERATIONS	MATERIALS CLASSIFICATION	Blows Per Ft. Spoon	Sample No.	Sample Range	% Core Recovery
	Drove 1½" I.D. X 5 ft. solid type sampler 40.0	Gray, medium compact, slightly clayey, gravelly	washed			THE PERSON NAMED IN COLUMN NAM
	to 45.0 ft Piece of gravel blocked sample	SAND (SP-SC), wet Till	26			4
	entry at about 43°		46	s <b>-</b> 8	41.0 to	
	Advanced casing to 45° and washed out.		50		45.0	
5.0			70			
	Drove 1½" I.D. X 5 ft. solid type sampler 45.0		24			U) iii
	to 50.0 ft.		32	<b>5-9</b>	45.0 to	
	_	•	37	5-9	50.0	in a strong of the strong of t
			27			West of the second of the seco
0.0	Drove 1½" I.D.X 5 ft.		21			£
	solid type sampler 50.0 to 55.0 ft.		13			and the state of t
			24	S <b>-1</b> 0	50.0 to	
		est en	27		55.0	
			18			and the little of the state of
5.0	Drove 15" I.D. X 5 ft.		30			-
	solid type sampler 55.0 to 60.0 ft.		40		55.0	- in the second
			30	S-11	to 60.0	A see any
			11		. <b></b>	i i i i i i i i i i i i i i i i i i i
0.0			40		·	Harmonic make any alight
	Drove $1\frac{1}{2}$ " I.D. X 5 ft. solid type sampler 60.0		50	<b>-</b>		
	to 63.1 ft Refusal 100 blows/no penetration		47	S <b>-1</b> 2	60.0 to	-
3.1	Bottom of Exploration		57		63.1	spanices of the second
†	at Refusal		200		***	r e

#### GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c. p. g.

FRIALS AND ROCK CLASSIFIED IN FIELD WITH-

LABORATORY ANALYSIS.

JECT:	STF Additions	LOCATION: Dever,	N. H.			
ng No.	A-13 Started: 11-2	23-76 Completed: 12-1-76	<u>,                                    </u>	Driller: A	dams	
<sub>§</sub> ?TH	OPERATIONS	MATERIALS CLASSIFICATION	Blows Per Ft. Spoon	Sample No.	Sample Range	% Core Recovery
Pl.	Drove 12" I.D. X 5 ft. solid type sampler 0.0	Brown changing to gray, Gravel, Sand, Silt, Clay,		1		
	to 5.0 ft.	Wood, etc. Fill	14	4		9-
¥			12			
3			28	1		
5.0_			19			
	Drove $1\frac{1}{2}$ " I.D. X 5 ft. solid type sampler 5.0		17			
	to 10.0 ft.		23		5.0	
i di	Drove hX FC casing to		18	S-1.	to 10.0	
ē	10° Arad washed out.		12			
0.0_			11			
nd.	Drove 1½" I.D. X 2 ft. split type sampler 10.0 to 12.0 ft.	(wood on top of sample) Mottled Gray, stiff, CLAY (CL), moist	1/: 24	S-2	10.0	
2.0_	Advanced casing to 14.5 with refusal, cleaned		30	casing	to 12.0	
10 to	out and tried to drive $1\frac{1}{2}$ " I.D solid sampler 100 blows with no		26	casing		
4.7_	Penetration - Refusal  Bottom of Exploration		76	casing		
я	at Refusal					
y 30" ammer	Penetration of samplers fall of 140 lb. drive and pf casing by 18" of 300 lb. drive hammer.	GROUND WATER READINGS:  5 minutes after removing 12-7-76 1:30 PM water a			ter at	7.1 ft

#### GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c. p. g.

ROJECI:	STP Additions	LOCATION: Dever,		of them of the order of principal states of the princi		
oring No.	A-14 Started: 12-1	5-76 Completed: 12-15-76		Driller: Eea	ich	·
DEPTH	OPERATIONS -	MATERIALS CLASSIFICATION	Biows Per Ft. Spoon	Sample No.	Sample Range	% C Recove
<del>9</del> 73	Drove 2" I.D. X 5 ft solid type sampler 0.0	Brown, loose, silty,	15			The state of the
2.0	to 5.0 ft.	SAND (SM), wet	15	·		
		Brown, compact, silty, gravelly, SAND (SM), wet	32	~ 4	2.0	Part of the second
		Till	50	S <b>-1</b>	to 5.0	Harris and the state of the sta
5.0	Decree Of T.D. V. C. of	<u></u>	55			Toron similar
	Drove 2" I.D. x 5 ft. solid type sampler 5.0 to 7.0 ft.		102			the state of the s
7.0			130			[]
	solid type sampler to 10.0 ft.	·	140	S-2	7.0 to	n n
			92		0.00	Will be a second of the second
18:8			50 300			No. of
	Refusal at 10.1 ft. 100 blows with no					Aggineration (Inches
	penetration Fottom of Exploration					
	at Refusal					Signary.
						-
						To provide the second
				<u> </u>		<u>_</u>
	Penetration by 30" fall Dark drive hammer.	GROUND WATER READINGS:  10 minutes after comple	tion: 3	Water a	t 7.0 f	t.
						Accessed.
						with the second second
	AND ROCK CLASSIFIED IN FIELD WITH-	PW.	Kum	1		washinda in an annua
. 5 (2010		LOG COMPILED BY:	s ~ WWW	<u></u>		F

## GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c. p. g.

gg No.	A-21 Started:	12-2-76	Completed: 1	2-8-76	Driller: Ada	ams	blows/f
PTH	OPERATIONS .	М	ATERIALS CLASSIFICATIO	N Blows N Per Ft Spoon		Sample Range	Casing  ####Gome  * #eeooey
-	Drove $1\frac{1}{2}$ " I.D. X 5 solid type sampler		black and gravel				
	to 5.0 ft.	Sand,	Wood, Plastic, etc., dump f.				a.
	Drove BX FC casing 5' and washed out.		-	18			
	J William Wallet		٠.	21			
5.0				21			
) • U	Drove 12" I.D. X 2 split type sampler	ft.		4			
	to 7.0 ft.			7		5.0	
'.O	No sample recovered Drove 1½" I.D. X 5	ft.		6	S-1	to 10.0	
	solid type sampler to 10.0 ft.			10			
tilg.	Advanced casing to and washed out.	10"		12			
0.0	D rove 11 I.D. X	5 ft.	â	19			
	solid type sampler to 15.0 ft.			7			
	No sample recovere (material too slop	py)		9			
	Advanced casing to	15.		11			
	and washed out.	·		13			
.0	Drove 1½" I.D X 2	ft. Gray,	loose, SAND (	SP),		15.0	
	split type sampler to 17.0 ft.	· 15.0  wet wi	th wood (O.G.	?)	5-2	17.0	
7.0			·	11			
30"	enetration of sampl fall of 140 lb. dr , of casing by 18" lb. drive hammer.	rive ha 12-2. fall 12-3.	-76 7:15AM 10:55AM -76 10:50AM	" " 5.	5 ft.		
PIAIS	AND ROCK CLASSIFIED IN FIEL	D WITH-		2011			

# GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c. p. g.

No.	A-21 Started:	Completed:		Driller:	b	lows/
Н	OPERATIONS	MATERIALS CLASSIFICATION	Blows Per Ft. Spoon	Sample No.	Sample Range	Casi ####
	Advanced casing to 20' and cleaned out.					32
.0_ .0_	Drove 1½" I.D. X 2 ft.	Gray, moderately stiff, CLAY (CL) and brwon, loose, SAND (SP) with wood, wet	6	S-3	20.0 to	25
	split type sampler 20. to 22.0 ft.		17		22.0	12
	Advanced casing to 25° and washed out.					11
.0_	Drove 1½" I.D. X 5 ft.	Gray and Brown, medium compact, gravelly, SAND	57	_		20
<sup>4</sup> No.	solid type sampler 25. to 30.0 ft.	(SP), wet	231	S-4	25.0 to	
	Advanced casing to 30' and washed out.		41		30.0	
0.0	Drove 1½" I.D. X 5 1t.		47 25	-		
-	solid type sampler 30. to 35.0 ft.		19	- S-5	30.0 to	
	Advanced casing to 35° and washed out.		39	-	35.0	
;.O_	Drove 1½" I.D. X 5 ft. solid type sampler 35. to 39.6 ft Refusal 100 blows with no penetration	0	52 40	s-6	35.0 to 39.6	
.6			67	_		

#### GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c. p. g.

Orove 1½" I.D X 5 f solid type sampler to 5.0 ft.  Drove BX FC casing 5 and washed out.  Drove 1½" I.D. X 2 split type sampler to 7.0 ft.	to	Grits, dark brown, silty, gravelly, SAND to dark gray of the same, wood, paper, plastic, etc.  Fill (dump)	Blows Per Ft. Spoon 6 10 9 16	Sample No.	Sample Range	Casing   表表表表
orove BX FC casing or and washed out.  Orove 1½" I.D. X 2 split type sampler to 7.0 ft.	to	gravelly, SAND to dark gray of the same, wood, paper, plastic, etc.	10 9 16			
Orove BX FC casing 5° and washed out.  Orove 1½" I.D. X 2 split type sampler to 7.0 ft.	to	paper, plastic, etc.	9 16			
orove 1½" I.D. X 2 split type sampler to 7.0 ft.	ft.	Fill (dump)	16	-		
orove 1½" I.D. X 2 split type sampler to 7.0 ft.	ft.	· •	·	-		
split type sampler to 7.0 ft.			12			
split type sampler to 7.0 ft.		1				
	J		9			
No sample recovered			13		5.0	
Prove $1\frac{1}{2}$ " I.D. X 5 solid type sampler			7	S-1	to 10.0	
to 10.0 ft. Advanced casing to	10.		9			
and washed out			25	-		
		Brown and Gray, layers	12	S-2	to	
to 12.0 ft.		of SILT, CLAY & SAND (ML,CL & SP), wet	19	-	12.0	
	15•					40
ind washed out.						32
		Gray, soft, CLAY, (CL), wet		•	4 ~ 5	21
plit type sampler			2	S-3	to	
co 17.0 ft.			8		17.0	
fall of 140 lb. dr., and of casing by	rive 18"	12-2-76 8:30AM " 12-7-76 1:30PM "	" 9.1 " 8.7	ft.		
	o 10.0 ft. dvanced casing to nd washed out  rove 1½" I.D. X 2 plit type sampler o 12.0 ft.  dvanced casing to nd washed out.  rove 1½" I.D. X 2 plit type sampler o 17.0 ft.  netration of sampl fall of 140 lb. d; , and of casing by f 300 lb. drive ha	dvanced casing to 10° and washed out  rove 1½" I.D. X 2 ft. plit type sampler 10.0 to 12.0 ft.  dvanced casing to 15° and washed out.  rove 1½" I.D. X 2 ft. plit type sampler 15.0 to 17.0 ft.  netration of samplers fall of 140 lb. drive, and of casing by 18" f 300 lb. drive hammer.	on 10.0 ft.  dvanced casing to 10'  nd washed out  rove 1½" I.D. X 2 ft. plit type sampler 10.0 of SILT, CLAY & SAND (ML, CL & SP), wet  dvanced casing to 15' nd washed out.  Gray, soft, CLAY, (CL), wet  rove 1½" I.D. X 2 ft. plit type sampler 15.0 o 17.0 ft.  netration of samplers fall of 140 lb. drive, and of casing by 18" f 300 lb. drive hammer.  GROUND WATER READINGS: 12-1-76 4:10PM Water 12-2-76 8:30AM " 12-7-76 1:30PM "	solid type sampler 7.0 to 10.0 ft. dvanced casing to 10.0 ft. dvanced casing to 10.0 ind washed out    rove 1½ " I.D. X 2 ft. plit type sampler 10.0 of SILT, CLAY & SAND (ML, CL & SP), wet   19    dvanced casing to 15.0 ind washed out.   Gray, soft, CLAY, (CL), wet     rove 1½ " I.D. X 2 ft. plit type sampler 15.0 of 17.0 ft.   8    netration of samplers fall of 140 lb. drive, and of casing by 18" f 300 lb. drive hammer.   12-7-76 1:30PM   9    GROUND WATER READINGS: 12-1-76 4:10PM Water at 8.8 incomplete 12-7-76 1:30PM   9.1 incomplete 12-7-76 1:30PM   12-7-76	solid type sampler 7.0 to 10.0 ft. dvanced casing to 10' and washed out  rove 1½" I.D. X 2 ft. plit type sampler 10.0 brown and Gray, layers of SILT, CLAY & SAND (ML,CL & SP), wet  dvanced casing to 15' nd washed out.  Gray, soft, CLAY, (CL), wet  Gray, soft, CLAY, (CL), wet  2 S-3  netration of samplers fall of 140 lb. drive, and of casing by 18" f 300 lb. drive hammer.  GROUND WAIER READINGS: 12-1-76 4:10PM Water at 8.8 ft. 12-2-76 8:30AM " 9.1 ft. 12-7-76 1:30PM " 8.7 ft.	10.0   10.0

## GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c. p. g.

ECT:	STP Additions		LOCATION: Dover,	и. н.			ne programme de la companya de la co
No.	A-28 Storted		Completed:		Driller:		blows
H	OPERATIONS		MATERIALS CLASSIFICATION	Blows Per Ft. Spoon	Sample No.	Sample Range	Casif
7.0	Advanced casing to and washed out.	20•	(see page 1)				30
					in the second se		28
.0_	Drove $1\frac{1}{2}$ " I.D. X 2 split type sampler to 22.0 ft.			1 6	S-4	20.0 to 22.0	20
	Advanced casing to and washed out. tough going at end casing						37 38 29
. 0_	Drove 1½" I.D X 5 solid type sampler to 30.0 ft.		Gray, medium compact, clayey, gravelly, SAND (SC), wet	43 57	S <b>-</b> 5	25.0 to 30.0	
	Advanced casing to and washed out.	30*		38 28			tar ser
0_	Drove 1½" I.D. X 5 solid type sampler to 35.0 ft.			28 95 30		1,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
	Advanced casing to and washed out, ca is sprung 10' from bottom	sing		60	S-6	30.0 to 35.0	
. 0_				27			

## GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c. p. g.

DJECT:	STP Additions	LOCATION: Dover,	N. H.			
ng No	A-28 Started:	Completed:		Driller:		
95t.0	OPERATIONS Drove 12" I.D. X 5 ft.	MATERIALS CLASSIFICATION	Blows Per Ft. Spoon	Sample No.	Sample Range	% Core Recovery
	solid type sampler 35.0 to 40.0 ft.	(see page 2)	33			
ai Ú		•	31	S-7	35.0 to 40.0	
			42		40.0	
0.0	Drove 15" I.D. X 5 ft.		59			
*2 <b>.</b> 2	solid type sampler 40.0 to 42.2 ft Refusal 100 blows/no penetration	Fractured rock 42 to 42.2 see S-8	55 190	S <b>-</b> 8	40.0 to 42.2	
1	Bottom of Exploration at Refusal		1000			
n e						
e e						
-						
,						
er .						

## GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c. p. g.

ing No.	A-33	Started: 12-14-	-76 Completed: 12=1:-7	5	Driller: Ada	ıms	
PTH	OPERATIO		materials classification	Blows Per Ft. Spoon	Sample No.	Sample Range	% C Reco
	Drove 2" I.D solid type so to 5.0 ft.		Plack and Prown, SILT, GRAVEL, SAND, WOOD, PAPER, etc. dump fill	11 8 35			a.
5.0_	Drove 2" I.D	. X 5 ft.	· .	17 8			
.0_	solid type sto 10.0 ft.			13		0.0	
······································	Drove 1½" I.		Gray, medium compact, to compact, slightly silty, gravelly, SAND (SP-SM), wet	36 86 61	S-1	8.0 to 10.0	
. • 0	to 15.0 ft.	ampror roye	Prown, compact, silty, gravelly, SAND (SM), wet	55 66 <b>7</b> 8	S-2	11.0 to 15.0	
j.0_	Drove $1\frac{1}{2}$ " I. solid type s to 20.0 ft.	D. x 5 ft. ampler 15.0		160 36 42	-		
RKS: P	enetration by 40 lb. drive	30" fall hammer.	GROUND WATER READINGS: Water at 1.3 ft. all the	cough	operati	ons and	l aft
	AND ROCK CLASSIFIE	D IN FIELD WITH-	LOG COMPILED BY:	41	·		

## GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c. p. g.

OJECT:	STP Additions	location: Dove	c, N. H.		
ing No.	.1-33 Started:	Completed:	Driller:		
PHO	OPERATIONS	MATERIALS CLASSIFICATION	Blows Per Ft. Sample Spoon No.	Sample Range	% Core Recovery
я		(see page 1)	100 228 S-3	15.0 to 20.0	
30.0	Drove 1½" I.D. X 5 ft. solid type sampler 20.0 to 25.0 ft. Hole caving badly		78 140 175 S-4	20.0 to 25.0	
\$ 5.0	Drove AX Rod probe 25.0 to 43.0 ft. Unable to pull back and exchange 5 ft. rods for 10 ft. ones due to cave		250 50 55 67 74 90 134 130 177 230 162 160 136		
13.0	Bottom of Exploration depth considered sufficient		109 122 93 100 133 76		

# GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c. p. g.

DECT:	STP Additions	LOCATION: Dover,	N. H.			
ing No.	A-35 Started: 12-15	-76 Completed: 12-15-76	5	Driller: Pes	ich	. \.
EPTH	OPERATIONS	MATERIALS CLASSIFICATION	Blows Per Ft. Spoon	Sample No.	Sample Range	% Core Recover
;	Drove 2" I.D. X 5 ft. solid type sampler 10.0 to 12.0 ft Refusal 100 blows/no penetratio Tried to drive 1½" I.D. sampler 100 blows with no penetration Bottom of Exploration at Refusal	n	3 6 1 2 1 3 3 11 27 65 276	S-1 S-2	8.0 to 10.0 10.0 to 12.0	
of 14	Penetration by 30" fall 0 lb. drive hammer.  AND ROCK CLASSIFIED IN FIELD WITH- ATORY ANALYSIS.	GROUND WATER READINGS: Water at 1.0 ft.	WI L	*; ;		- Community Community

## GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c. p. g.

	10 ft. towards A-31 fr A-752 Started: 12=15			Driller: Bea	a ch	
ng No.	A-35E Started: 12=15	-70 Completed: 12-13-70	Blows	1	1 1	
EPTH	OPERATIONS	MATERIALS CLASSIFICATION	Per Ft. Spoon	Sample No.	Sample Range	% Core Recover
F)	Drove 2" I.D. X.5 ft. solid type sampler 0.0	Brown, black and gray, loose, CLAY, WOOD, SILT,	13			
	to 5.0 ft.	PEAT and SAND interbedded (CL,ML,PT & SP), wet Fill	2	-	-	
		LIII	6	_	TE \$	
p S			6			
5.0_		·	5			
-	Drove 2" I.D. X 5 ft. solid type sampler 5.0		8			
	to 10.0 ft.		40			
			4			
d			3			
0.0			10			
11.0_	Drove 2" I.D. X 5 ft. solid type sampler 10.0		13			
	to 15.0 ft.	Gray and brown, loose, gravelly, SAND (SP),	80			
		wet - some wood pr esent	143	S-3	11.0 to	
			45		15.0	
1 = 0			13	7		
15.0	Drove $1\frac{1}{2}$ I.D. X 5 ft.		5			
	solid type sampler 15.0 to 20.0 ft.		4	-		
				!	<u> </u>	
	enetration by 30" fall Dib. drive hammer.	GROUND WATER READINGS: Water at 0.9 ft.				•.
ERIALS /	AND ROCK CLASSIFIED IN FIELD WITH-	LOG COMPILED BY:	/			

#### GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c. p. g.

No.	Aーうらど Storted:	Completed:	ter	Oriller:		
ſΗ · Ο	OPERATIONS	MATERIALS CLASSIFICATION	Blows Per Ft. Spoon	Sample No.	Sample Range	% C Reco
No sample recovered (did not shear and wait	Gray, soft, CLAY (CL), wet	5				
	for swelling)		6			
.0			7			
_	Drove 12" I.D. X 5 ft. solid type sampler 20.0	· .	6	-		
	to 25.0 ft.		7		20.0	
			9	S-4	to 24.0	
/o_			10			
.0]	·	Gray, stiff, gravelly, CLAY (CL), wet	85			
	Drove $1\frac{1}{2}$ " I.D. X 5 ft. solid type sampler 25.0		136	S <b>-</b> 5	25.0 to	
Wg.	to 30.0 ;ft.		30		28.0	
.0]			55			
	e e e e e e e e e e e e e e e e e e e	Gray, compact, clayey, gravelly, SAND (SP-SC),	54	s <b>-</b> 6	28.0 to	
.0		wet Till	32		30.0	
	Drove AX Rod probe 30.0 to 34.1 ft Refusal		20			
1	100 blows with no penetration		17			
			31			
.1			100			
	Bottom of Exploration at Refusal		400			
·						

# RODNEY R. ADAMS, c.p.g. GRANITE STATE EXPLORATIONS

PROJEC	CT: STP Addit	ions		LOCATION:	Dover,	N.H.		· · · · · · · · · · · · · · · · · · ·	
Boring N	No. C-1	Started:	4-18-	.77 Completed:	4-19-77		Driller:	Adams	
DEPTH	OPER	ATIONS		MATERIALS CLASSIFICAT	TION	Blows Per Ft. Spoon	Sample No.	Sample Range	% Core Recovery
1.0_	Drove 1 1/2 type sample			Sand and gravel Dark brown, compact (%L), barely moist.	, SILT	0 10			B-
5.0				· .			S <b>-1</b>	1.0 5.8	
5.0_ 5.4_	Prove 1 1/2 type sample	-		Dark brown, compact.		45	S <b>=2</b>	E 4	
6.0_ 7.0_	Drilled wit	h 3ª flite		gravelly, SILT ("), moist.  Brownish-gray, soft.		32	3#2	5•4 to 6•0	
<sup>†i</sup> n	angers	12 12 100		(Cl), moist to wet of depth Gray at about 13 ft	with				
12.0	Drove 1 1/2 type sample ft.						S <b>=3</b>	10.0 to 12.0	
	Frilled with auger.	a 3° flite							
15.0	Drove 1 1/2 type sample:				•	0	S <b>-4</b>	15.0 to 17.0	
EMARKS: Penetration of samplers by 30" fall of 140 1b drive hammer.		₩	GROUND WATER READI Water at 10 Hole at 30	0.0 ft.	4-18-77	at 4:40	PM		
				Water at 8		4-19-77	at 8:00	AM	
ATERIA	LS AND ROCK	CLASSIFIED II		•					
YSIS.	ITHOUT LABOR	MATURT ANA	-	LOG COMPILED BY:			•••••••		

#### GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c. p. g.

CHARLESTOWN, N. H.

LOCATION: DJECT: Dover, N.H. STF Additions Driller: ing No. Started: Completed: Adams 4-19-77 4-18-77 C-1 Blows % Cor Recovery Sample Sample MATERIALS CLASSIFICATION Per Ft. **EPTH OPERATIONS** Spoon Range 17.0 Drilled with 3" flite augers 19.q Gray, loose, clayey, gra elly SAND (SE), wet. 20.0 20.0 Drove 1 1/2" I.D. split type S-5 to sampler 20.0 to 30.0 ft. 7 21.2 21.2 Brown, compact, silty, 21.2 63 22.0 5-6 gravelly, SAND (SM), wet. to 22.0 25.4 Gray, compact, gravelly, 24 clayey, SAND (SC), wet, Pasal till 26 25.0 S-7 55 to 30.0 82 124 30.0 Drilled with 3" flite augers to refusal at 43.5 ft. cottom of explorations at refusal

# GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c.p.g.

PROJECT: STP Additions		Completed:	4-20-77		Driller: <sub>ĝ</sub>	dams	
Boring No. C+2 Start				Blows Per Ft. Spoon		Sample	% Core
DEPTH OPERATIONS	MAT	ERIALS CLASSIFICA	TION	Spoon	Sample No.	Range	Recover
Drilled with 3" fli	5.0 ft. (SF), Dry t  7.0 ft. Frown moist	, loose, gravel. with occassions o wet below 5 f	el SILT.	9 18 9 9 11 10	S-1 S-2	-0.0 to 5.5 5.5 to 7.0	
10.0 10.2 Drove 1 1/2" 1.5. s type sampler 10.2 t 11.3 12.0 Drilled with 3" fliaugers.	o 12.0116618, some	n, commact, silt	у,		S-3 S-4	10.2 to 11.3 11.3 to 12.0	
Drove 1 1/2" I.D. s type sa pler 15.0 t 17.0 Drilled with 3" fli augers.	0 17.0			63	S <b>-</b> 5	15.0 to 17.0	
REMARKS:::penetration::of::se	drive	GROUND WATER REA	at 5.7 ft	•	at ll:		

# GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c. p. g.

oring No.	C-2 Started: 4-20-77 Completed: 4-20-77 Driller: Adams							
DEPTH	OPERATIONS	MATERIALS CLASSIFICATION		Blows Per Ft. Spoon	Sample No.	Sample Ranga	% Co Recov	
20.0	Drove 1 1/2" J.D. solid type type sampler. Refusal-100 blows, no penetration.	•		70 100		21.5	The state of the s	
22.2	Bottom of exploration at refusal.	Highly fractured rock.		500	S <b>-6</b>	to 22.2		
44.								

#### GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c.p.g.

PROJECT: STP Additions	LOCATION: Dover,	N.H.			
Boring No. C-3 Started: 4-1	19-77 Completed: 4-19-77		Driller:	Adams	**
DEPTH OPERATIONS	MATERIALS CLASSIFICATION	Blows Per Ft. Spoon	Sample No.	Sample Range	% Core Recovery
Drove 1 1/2" I.D. solid type sampler 0.0 to 2.0 ft. Lost most of sample  2.0  Drove 1 1/2" I.D. split type sampler 5.0 to 7.0 ft. Lost sample. Drilled with 7.0 Jite augers to 7.0 ft. Drove 1 1/2" I.D. split type sampler 7.0 to 9.0 ft.  9.0  Drilled with 3" flite augers. Prove 1 1/2" I.D. split 11.0 type sampler 10.0 to 12.0ft  12.0  Drilled with 3" flite augers. Refusal at about 13.9 ft. 2000 lbs. on bit.  Bottom of exploration at refusal.	Prown-gray, soft, SILT & CLAY (ML & CL), moist to wet.  Gray, soft, CLAY (CL), with occassional brown silt layers at about 1/2" thick, wet.	9 10 11 10 1	S-1 S-2 S-3	7.0 to 9.0 10.0 to 11.0 to 12.0	
MATERIALS AND ROCK CLASSIFIED IN FIELD WITHOUT LABORATORY ANA-	GROUND WATER READINGS:  Sater at 2.4 ft.  LOG COMPILED BY:		at 8:10		

# GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c.p.g.

PROJEC	T: STP Additions	LOCATION: Dover, N	.H.	er is friendemed construction may not enterediment in foresterning		75 mags (1971 18 18 19 19 19 19 19 19 19 19 19 19 19 19 19
Boring N	lo. C-5 Started: 4-19	-77 Completed: 4-19-77		Driller:	Adama	
DEPTH	OPERATIONS	MATERIALS CLASSIFICATION	Blows Per Ft. Spoon	Sample No.	Sample Range	% Core Recovery
	Drove 1 1/2" I.D. solid type sampler 0.0 to 5.0 ft.	• • • • • • • • • • • • • • • • • • •	<b>4</b> 8			·
5 <b>5</b> 0_	Drove 1 1/2" 1.0. split	Gray with black organics, loose gravelly, SAND (SP),	44	S-1	5.0 to	
7.0_	type sampler 5.0 to 7.0 ft.	wet.	19		6.8	
1000	Proce 1 1/2' 1.D. split	en e	10	S-2 S-3	10.0 to 11.0 11.0	
12.0		Gray, slayey, soft, CLAY (31), with occassional brown silt layers, wet.	10		12.0	
15.						
15.5	type sampler 15.0 ffol7.oft	gravelly, SAND (SI), wet.	, <u>16</u>	S-4	15.5 to 17.0	
b <b>y</b> 3	KS: Penetration of samplers. O" fell of 140 lb. drive	TILL GROUND WATER READINGS: 4-19-77 at 4:15 P 4-20-77 at 8:10 A	VWater			
MATER FIELD LYSIS.	IALS AND ROCK CLASSIFIED IN WITHOUT LABORATORY ANA-	LOG COMPILED BY:				

# GRANITE STATE EXPLORATIONS

ODNEY R. ADAMS, c. p. g.

ECT: STP Additions	LOCATION: Bover,	N.H.		AKLESIOWN, N		
No. C-5 Started: 4-19-77	Completed: 1-19-77	Driller: Adams				
H OPERATIONS	MATERIALS CLASSIFICATION .	Blows Per Ft. Spoon	Sample No.	Sample Range	% Care Recover	
7.0 Drilled with 3" flite augers.	a	26 <b>4</b> 0	S-5	20.0 to		
Drove 1 1/2" I.D. solid type sampler 20.0 to 22.2, 100 blows-no penetration. Lost most of sample.		120	_	22.2		
Bottom of exploration at refusal.						

# GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c.p.g.

PROJECT: STF Additions	LOCATION: Dower, R	10 may 10			
Noved 7 ft. west  Boring No. ₹-6  Started:	4-23-77 Completed: 4-29-77		Driller:	Adams	H
DEPTH OPERATIONS	MATERIALS CLASSIFICATION	Blows Per Ft. Spoon	Sample No.	Sample Range	% Cor Recove.
no penetration. Moved 7 west stated new boring  5.0  Drove 1 1/2 T 1.D. splitype sampler 5.0 to 7.0  7.0	ft. blow Brown, compact, clay (CL), ft. with occassional sand layers, moist.  t	7 9 20 24 50 57 74	S-1	5.0 to 7.0	
Prove 1 1/2" I.D. solid type sampler 9.0 to 14.  14.0  Drilled with 3" flite a	0 ft.	69 39 39 53 55	S-2	9 <b>9</b> 0 to 14.0	
Drove 1 1/2" I.D. solid type sampler 15.0 to 20 Drilled with 3" flite s to 20.0 ft.	e.O ft.	14			The state of the s
REMARKS: Penetration by 30" i	GROUND WATER READINGS:  Water at 7.4 ft		7 at 1:	35 P#	man de la constitución de la con
MATERIALS AND ROCK CLASSIFIED FIELD WITHOUT LABORATORY AN LYSIS.		7	Do kar	<u>L</u>	-

### GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c. p. g.

UECT:	STB Additions		LOCATION: Dover,	K.".			
ng No.	C-6	4-23-77	Completed: A=29=77		Driller: Að	ams	
PTH	OPERATIONS		MATERIALS CLASSIFICATION	Blows Per Ft. Spoon	Sample No.	Sample Range	% Core Recovery
ž				16	5-3	29.0 to 29.	
	·		-	29		<b>-y</b>	
g				7_	<del> </del>		
20.0			·.	30	S-4	20.0 to 25.0	
	Drove 1 1/2" 1.D. solid sampler 20.0 to 25.0 ft Drilled with 3" flite a	.		<u>30</u> 66			
				111			
5 %.				25			
25.0	Drove 1 1/2" I.D. so'id	type			S <del>-</del> 5	25.0 to 30.0	
4	sampler 25.0 to 70.0 f	t.		97			
a a				<u>110</u> 54			
-				95	+	70.0	
30.0	Drove 1 1/2" I.D. solid sampler 30.0 to 35.0 ft	type		325	3-6	30.0 to 35.0	
ń				120 155		Authority on the state of the s	
2							
35.0							
	Bottom of explorations instructions.	per	•				

# GRANITE STATE EXPLORATIONS RODNEY R. ADAMS, c.p.g.

PROJEC	T: STP Additions	LOCATION: Dover, N	• H •			
Boring N	lo. C=7 Started: 4-23	~77 Completed: 4-22-77	÷	Driller: A	dans	
DEPTH	OPERATIONS	MATERIALS CLASSIFICATION	Blows Per Ft. Spoon	Sample No.	Sample Range	% Core Recovery
	Drove 1 1/2" I.D. solid type sampler 0.0 to 5.0 ft.	Topsoil	3	-		
1.0_	Oylo. Billipiel Oylo	Grayish brown, compact, dessicated CLAY (CL), barely moist.	6 16 30			- a
5.0	brove 1 1/2" I.D. split type sampler 5.0 to 7.0 ft.		51 57 60	S-1	5.0 to 7.0	
7.0	Drilled with 3" flite augers.					
'9.5 1115	Prove 1 1/2" I.T. split type sampler 9.5 to 11.5 ft Pocket pentrometer 3.3 tons by square ft. Drilled with 3" flite augers.	Color changes to brown	17 30	S-2	9.5 to 11.5	
1\$.(	Drove 1 1/2" I.D. split type sampler 15.0 to 17.0 ft. Pocket pentFometer 2.3 tons/squa e ft.		12 16	- S-3	15.0 to 17.0	
REMĄR	KS: Penetration of samples	GROUND WATER READINGS:	4-22-7	77 at 11	:45 AM	
	mmer.	Water at 27.0 ft	•			
MATER FIELD LYSIS.	RIALS AND ROCK CLASSIFIED IN WITHOUT LABORATORY ANA-	LOG COMPILED BY:			••••••	

### GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c. p. g.

DECT:	: STP Additions	LOCATION: Dover	, н. н.			
ng No	C-7 Started: 4-	-21-77 . Completed: Δ-22-7	77	Driller: A	dams	
PTH	OPERATIONS	MATERIALS CLASSIFICATION	Blows Per Ft. Spoon	Sample No.	Sample Range	% Core Recover
17.0	Drilled with 3" flite auge	ers.				
ਜ						
20.0	Drove 1 1/2" J.D. split type sampler 20.0 to 22.0	ft Tecomes softt.	5_	S <b>-4</b>	20.0 to 22.0	
22.0	Drilled with 3" flite ampe	ers	12			
′ ′25 <b>.</b> 0	Drove 1 1/2" I D. split typ					
27.0	sampler 25.0 to 27.0 ft.	rostly gray	<u>5</u>	S <b>-</b> 5	25.0 to 27.0	
28.5		`S.				
	Dro e 1 1/2" I.D. split typ sampler 30.0 to 32.0 ft.	Brown compact, silty, gravelly, SAND (Sc), wet	30	o 1	30.0	
32.Q	-	rs •	50	S-6	to 32.0	
75.0					<u>-</u> . ·	
	Drove 1 1/2" I.D. solid typ sampler 35.0 to 42.0 ft.	e	26	6 7	35.0	
			78	S <b>-7</b>	to 40.0	

### GRANITE STATE EXPLORATIONS

ECT:	radiones monantialelas con esteras, amanes transmissiones del material antidos estados es con el finar second estados	LOCATION:	Emiliates consistent and the contraction of the con	Der Christian in American
	C-7 4-21-	<del>-77 4-22-7</del> 7	Adams	
g No.	Started:	Completed:	Driller:	
гн -	OPERATIONS	MATERIALS CLASSIFICATION	Blows Per Ft. Sample Sample Spgon No. Range	% Co Recov
0.0			71	
2,0	Drove 1 1/2" I.D. solid type sampler 42.0 to 49.0 ft.	e		
7.0 8.0	Prove 1 1/2" I.D. solid type sampler 47.0 to 52.0 ft.	Gray compact, clayey, gravelly	90	
		SAND (SC), moist.  Basal till	80 133 182 8-9 48.0 to 52.0	
2.0	Bottom of exploration Depth considered sufficient			

#### GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c.p.g.

'ROJEC	CT: STP Additions	LOCATION: Dover,	N.H.			
Boring N	No. C=8 Started: 5-2	Completed: 5-3-77		Driller:	ldsma	
ЭЕРТН	OPERATIONS	MATERIALS CLASSIFICATION	Blows Per Ft. Spoon	Sample No.	Sample Range	% Core Recovery
	Drove 2" I.D. solid type type sampler 0.0 to 1.5 ft.	Topsoil	5			
<b></b>		Brown, stiff to moderately stiff. Desicosted CLAY (CL),	11			e en
a a		moist.	27	1		
5.0			45			
	Drove 1 1/2" I.D. solid type sampler 5.0 to 10.0 ft	-	63 36	-		
	Drove FX-FC casing to 10.0 ft. and washed out.		74			
			80	S <b>-</b> 1	5.0 to	
10.0			80		10.0	
Ī	Prove 1 1/2" I.D. solid Type sampler 10.0 to 15.0		80 10			
	t. Advanced casing to 5.0 ft. and washed out.		17			
			20	5-2	10.0 to 15.0	
15.0			25		2)•0	
1) t	rove 1 1/2" i.D. solid yee sampler 15.0 to 20.0		10			
10.14	dvanced casing to 20.0 ft.	Brown, scompact, silty, agrav-	13			
	SPenetration-by-50*-fall-	GROUND WATER READINGS:				
	O-lbdrive-hammer.	5-3-77 at 9:45 A"-15 Sampling to 33.3 ft	minutes t%ate	after: er at 11.	2 ft.	
		5-3-77 at 11:15 Aff-cs 25 minutes later9	e <b>singg</b> pu Water at	illed and	•	
TERIA	LS AND ROCK CLASSIFIED IN ITHOUT LABORATORY ANA-	LOG COMPILED BY:	Wa	lish		

#### GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c. p. g.

<sup>g No.</sup> C-8	Started: 5-2-77	Completed: 5- <b>2-7</b> 7		Driller: Adı	ams	
тн	OPERATIONS	MATERIALS CLASSIFICATION	Blows Per Ft. Spoon	Sample No.	Samp * Range	% ( Reco
	•		33	S <b>-</b> 3	15.0 to 16.7	
Advand and was been brove sample	1 1/2" I.D. solid type or 20.0 to 25.0 ft.  ded casing to 25.0 ft. ashed out.  1 1/2" I.D. solid type or 25.0 to 30.0 ft.  ced casing to 30.0 ft.		63 48 20 55 130 128 40	S <b>-4</b>	20.0 to 25.0	
and was	l 1/2" I.D. solid type or 30.0 to 33.3 ft. al at 33.3 ft. 100 blows metration.		63 140 474 331 163	S=5	25.0 to 30.0	
Bottos refusa	n of exploration at		390 800	S-6	to 33.3	

### GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c.p.g.

PROJEC	CT: STP Additions	LOCATION: Dover,	N.H.			
Boring I	No. C=9 Started: <-2	21-77 Completed: 4-21- 7		Driller: A	gama	
DEPTH	OPERATIONS .	MATERIALS CLASSIFICATION	Blows Per Ft. Spoon	Sample No.	Sample Range	% Core Recover
109			3			
	Drove 1 1/2" 1.D. Solid type sampler 0.0 to 5.0 ft.		9	†		
x		bedded FINE SANDS(SU), with Iron oxide stains, barely	18	1	0.0	-
		moist to wet with depth.	30	S-1	to 5.0	
			33	†		
5.0_	Drove 1 1/2" 1.D. split type sampler 5.0 to 5.0 ft.		21	S <b>-</b> 2	5.0	
	Drilled with 3" flite augers to 7.1 ft.		39	J <b>-</b> 2	to 7.0	
7.0	Drove 1 1/2" I.D. solid	Brewn, compact, silty, gravelly, SAND (SM), meist	40	1	7.0	
7	type sampler 7.0 to 9.8 ft. Tried augers, refusal 1000	Till	90	S=3	to 9.8	
9.8	lbs. on bit.		178		9.0	
7 - 0	Bottom of exploration at refusal.					
	101 4041					
						·
EMARK	S: Penetration of samplers	GROUND WATER READINGS:	1	<u> </u>		I
by 3 hamm	0" fall of 140 lb. drive er.	No water in	n boring	;•		
• • • • • • • • • • • • • • • • • • • •						
ATERIA	LS AND ROCK CLASSIFIED IN					
	TITHOUT LABORATORY ANA-	LOG COMPILED BY:			•••••	

### GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c.p.g.

PROJEC	T: STP Additio	ons	LOCATION: Dover, 1			The same of the sa	e sentende kild tekte a tres species - lest en
Boring N	o. C-10	Started: 4-2	Completed: 4-21-(7		Driller:	Adams	
DEPTH	OPERA		MATERIALS CLASSIFICATION	Blows Per Ft. Spoon	Sample No.	Sample Range	% Core Recovery
	Drove 1 1/2" type sampler (Drilled with to 5.0 ft.	0.0 fto5.0 ft.	FILL	28 53 20 15			
10.0	Drove 1 1/2" type sampler	5.0 too 0.0 ith 3" flite  I.W. solid 10.0 to 15.0	Brown, medium compact, silty,	16 9 2 2 10 5	S-1	5.0 to 10.0	
	to: 15.0 ft. 0 lower sampler in at 9 ft. D casing to 15. cleaned out. Drove 1 1/2"	3" flite auge: on trying to on fill caves prove BX-FC oft. and	rsgravelly, SAND (SM), wet. TILL	16	S-2	10.0 ? to 15.0	·
16.0	type sampler	15.0 to 20.0f	Gray, medium compact, clayey, gravelly, SAND (SL), wet	80_			
30" hau	-fall-of-149-1	-	4-20-77 et A:A0				
MATER FIELD LYSIS.	IALS AND ROCK WITHOUT LABOR	CLASSIFIED IN RATORY ANA-	LOG COMPILED BY:		••••••		

### GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c. p. g.

)JECT:	STP Addition	7.5		LOCATION:	Bover, B	.H.			
ing No.	C+10	Started:	4-20-	77 Completed: A	!-21-77	I	Oriller: <u>A</u>	dema	
EPTH	01	PERATIONS		MATERIALS CLASSIFICATION		Blows Per Ft. Spoon	Sample No.	Sample Range	% Cor Recove
**						32			
						37		16.0	
-si					Ī	33	S <b>-3</b>	to 20.0	
÷				·.	ļ	31			
20.0	Drove 1 1/2	" I.D. solid	0 ft			33			
-	type sample	r 20.0 to 25	.0 10			35		20.0	
22.5	HEST TOTAL STATE			Highly fractured rock.		36	S <b>-4</b>	to 22.5	
a.				or and a second		66		22.7	
25.0						313		22.5	
· · · · · · · · · · · · · · · · · · ·	Bottom of a	xploration dered suffic	rient			113	S-5	to 25.0	
	20,000					· · · · · · · · · · · · · · · · · · ·	1		
									1
									1

### GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c.p.g.

PROJEC	T: STP Additions	LOCATION: Dove4, N	т.н.			and the second s
Boring N	No. C-12 Started: 5-3	3-77 Completed: 5-3-77		Driller:	dams	
DEPTH	OPERATIONS	MATERIALS CLASSIFICATION	Blows Per Ft. Spoon	Sample No.	Sample Range	% Core Recovery
	Drove 2" I.D. solid type sampler 0.0 to 1.0 ft.	Topsoil	3			
		Brown, thinly bedded, stiff, desiccated CLAY (CL),	12			
		barely moist.	18			
			28		-	
5.0_	Drove 1 1/2" I.D. solid		70			
	type sampler 5.0 to 10.0 ft. Drove BX-FC casing to		105			4
	10.0 ft. and washed out.		108	S <b>-1</b>	5.0 to	
			124		10.0	
10.0_			120			
	Drove 1 1/2" I.D. solid type sampler 10.0 to 15.0		15			
	ft. Lost sample, re-drove with trap in shoe advanced casing to 15.0 ft and		24		10.0	
	washed out.		33	S-2	to 15.0	
15.0_			64			
15.2_	Brove 1 1/2" I.D. solid type sampler, refusal at		100			
	15.2 ft. 100 blows no penetration.					
	S: Penetration-by-30"-fall-	GROUND WATER READINGS:				
	101011114-11111111111111111111111111	5-3-77 at 4:22 PMcm Water at 6.1		alled 1/	2 hour a	fter
	ALS AND ROCK CLASSIFIED IN WITHOUT LABORATORY ANA-	LOG COMPILED BY:	1 10	alell	·	

### GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c.p.g.

PROJECT	: STP A. sit	ions		LOCATION:	Dover, Y.	<i>.</i> b			
Boring No	o. C=13	Started:	4-22-77	Completed:	4-26-77		Driller:	l Jan.s	
DEPTH	OPERA	ATIONS	MA	TERIALS CLASSIFIC	ATION	Blows Per Ft. Spoon	Sample No.	Sample Range	% Core Recovery
5•0	Drove 1 1/2 type sampler rove 1 1/2 ype sampler	0.0 to 5.0	ft. clay	m, compact, des (CL), moist.	esicated	3 -6 -17 -37 -49 -49	S <b>-</b> 1	5.0 to	
9.5 t	Drolled with augers.  rove 1 1/2" ype sampler the sampler to the sampler to the sample of the sample	1.D. split 9.5 to 11.5	ft.			15 29	S <b>-</b> 2	7.0 9.5 to 11.5	
t; 17.0	rove 1 1/2"; ype sampler; t.	15.0 to 17.0				——12 ——20	S=3	15.0 to 17.0	
	Penetration		G	4-26-77	at 9:00 AV at 12:40 P at 2:25 PM	nWrte	r at 25.	7 ft.	L
	S AND ROCK ( THOUT LABOR		;     L	LOG COMPILED BY:.		f(c.	) Cal		

### GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c. p. g.

oring No.	C-13 Started: 4-22-	77 Completed: 4-2(-77	1	Oriller: Åð	ams	
DEPTH	OPERATIONS	MATERIALS CLASSIFICATION	Blows Per Ft. Spoon	Sample No.	Sämple Ränge	% Ci Recov
	·					
20.0		. at			- 4-	!
	Drove 1 1/2" I.D. split type sampler 20.0 to 22.0 ft.	Very thin sand layers in	8	S-4	20.0 to	
22.0	·	sample.	12		22.0	
	Drilled with 3" flite augers.					
23.5		Brown, compact, silty,				
24.5	Drove 1 1/2" I.B. split	gravelly, SAND (SM), barely moist. TILL	48	S <b>-</b> 5	24.5 to	
26.2	type sampler 24.5 to 26.2. Refusal-100 blows no penetra- tion-1 ton on bit- refusal.		303		26.2	
<sup>igl</sup> ej	Bottom of exploration at refusal.					
i 1						

### GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c.p.g.

PROJEC	T: STP #d@itions	LOCATION: Perer.				
Boring N	lo. <b>~19</b> Started: 727	-77 Completed: 4-27-77		Driller: _	كانسقال	
DEPTH	OPERATIONS	MATERIALS CLASSIFICATION	Blows Per Ft. Spoon	Sample No.	Sample Range	% Core Recovery
q	Drove 2" 1.D. solid type	Topsoil	5			
2.0	smapler 0.0 to 2.0 ft.		5			a
b,		Brown, compact, dessicated, CLAY (CL), moist.	13			
2		•	27			
, <b>5.</b> 0	Prove 1 1/2" 1.D. solid type sampler 5.0 to 10.0 ft.		37 61	S-1	5.0 to 7.0	
7.0		Prown, compact, silty, gravelly, SAND (SM), damp	102 95	S <b>-</b> 2	7.0 to 10.0	
10.0	Drove 1 1/2" 1.D. solid ty tyce sampler 10.0 to 15.0 ft.		62 64		10.0	
			55 6 <b>5</b>	S-3	to 15.0	
15.0 15.7	type sampler15.0 to 1.7 ft	l e e e e e e e e e e e e e e e e e e e	136	S-3	15.0 to 15.7	
	Refusal 100 blowsno penetration.	Rook in bottom of sample 15.5 ft.to 15.7 ft.				
of11	(S: Penetration by 30% Call	GROUND WATER READINGS:	0 P.V1	ory to 1	5.1 ft.	
	IALS AND ROCK CLASSIFIED IN WITHOUT LABORATORY ANA-	LOG COMPILED BY:	. LC	telst		

## GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c.p.g.

oring N	lo. C-17 Started: 5-4-7	Completed: 5-5-77		Driller: Ad	ams	
EPTH	OPERATIONS	MATERIALS CLASSIFICATION	Blows Per Ft. Spoon	Sample No.	Sample Range	% Core Recovery
	Drove 27 I.D. solid type sampler 0.0 to 5.0 ft.	FILL	33 64 30			-
5.0_	Drove 1 1/2" I.D. solid type sampler 5.0 to 8.0 ft. Drove BX-FC casing to 10.0 ft. and washed out.	Dark brown with black, 1190se SA'D with organics, wet.	18 9 2 2	-		
8.O_		Brown topsoil, loose fine SAND (SU), wet.	22	S-1	8.0 <b>3</b> 0	
10.0	Drove 1 1/2" I.D. solid type sampler 10.0 to 12.8 ft. Advanced casing to 15.0 ft. and washed out.	Plack with brown, very loose, peat and SAND (PT & SU), wet.	2 2	S-2	10.0 10.0 to 12.8	
12.8		Brown, loose, gravelly, \$AND (SP), wet.	18	\$-3	12.8 to 15.0	
15.0	Drove 1 1/2" I.D. solid type sampler 15.0 to 20.0 ft. Advanced casing to 20.0 ft. and washed out.	Gray, soft, CLAY (CL), wet.	10 200	lbs.		
of	RKS: Penetration by 70" fall	GROUND WATER READINGS:  5-4-77 at 4:30 PF-cs  5-5-77 at 7:00 AM-dc  5-5-77 at 10:00 AM-dc	own O.1 casing	ft.	etc.	
MATE	RIALS AND ROCK CLASSIFIED IN ) WITHOUT LABORATORY ANA-	LOG COMPILED BY:	J. L.	) ci. (x) (r.	<u>.</u>	

### GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c. p. g.

DJECT:	STP Additions			LOCATION:	Dover,	N.H			
ing No.	C-17 S	tarted: 5-1	-77	Completed:	5-5-77	[	riller:	ams	
PTH	OPERATION:	5	MAT	TERIALS CLASSIFICA	TION	Blows Per Ft. Spoon	Sample No.	Sample Range	% Core Recover
5	·					200	_		•
	·					200			
				a		200	S <b>~4</b>	15.0 to	
¥						200	04	20.0	
20.0			-	•		200_			
	Drove 1 1/2" I.D. type sampler 20.0	to 25.0 ft.	•			200		20.0	
	Advanced casing to and washed out.	25.0 ft.				200	S <b>-</b> 5	to 24.3	
						200			
24.3						200		24.3	
25.0			1	t, gravelly,		26_	S <b>-6</b>	to 25.0	
	Drove-1 1/2" 1.D. type sampler 25.0	to 30.0 ft.	.clayey, g	ose to medium gravelly, SANI	compact,	43		. ~.	
	Advanced casing to and mashed out.	30.0 ft.	ret Fasal	Tibl		30		- 25.0	
						29	S <b>-7</b>	to 30.0	
`						21			
30.0			_			27			
	Drove 1 1/2" I.D. sampler 30.0 to 35					23			
	Advanced casing to and cleaned out.					35	5-8	30.0 to	
						40		35.0	
35.0_		3.3	-			55			
	Drove 1 1/2" I.D. sampler 35.0 to 40	.0 ft.				75_			
	Advanced casing to and washed out.	40.0 ft.			_	46			

### GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c. p. g.

No. C-17 Started: 5-4-7	Completed: 5-5-77	C	riller: Ada	ms	
OPERATIONS	MATERIALS CLASSIFICATION	Blows Per Ft. Spoon	Sample No.	Sample Range	% Co Recov
		144		75.0	
		54	s <b>-</b> 9	35.0 to 40.0	
		73_		40.0	
•0		93	_	<u>.</u>	
Drove 1 1/2" I.D. solid type sampler 40.0 to 45.0 ft.		94			
Lost sample, re-drove with basket trap in shoe. Sample		50			
lost-trap ruined. Advanced casing to 45.0 ft. and		100		·	
washed out.		54			
Drove 1 1/2" I.B. solid type		9			
sampler 45.0 to 50.0 ft. Advanced casing to 50.0 ft.		20	S-10	45.0 to	
and washed out.		21		50.0	
		27	-		
0.0		45.			
Drove 1 1/2" I.D. solid type sampler 50.0 to 55.0 ft.		44	_	50.0	
		60	S-11	<b>t</b> o 55.0	İ
		67			
		66	-		
550		142		55.0	
		96	S-12	to 58.7	
8.7		116			
Bottom of explorati n at refusal.		114	·		

### GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c.p.g.

PROJEC	OT: Sir Advitions	LOCATION: Downer, ?	F.H.		P-001	
Boring (	No. 6-18 Started: 4-	20-77 Completed: 4-26-77		Driller:	ત પૈલોઇ <b>ઇ</b>	
DEPTH	OPERATIONS	MATERIALS CLASSIFICATION	Blows Per Ft. Spoon	Sample No.	Sample Range	% Core Recovery
	Drove 1 1/2° I.B. solid type sampler 0.0 to 5.0 ft.	Brown, compact, dessicated CLAY (CL), moist.	3_			
			24 57	_		
5.0 <u>_</u>	Drove 1 1/2" 1.0. split t type supler 0.0 to 7.0 ft.		75 62 57	S <b>-1</b>	5.0 to 7.0	
7 <b>7</b> 0_	Drilled with 3" flite augers to 9.5 ft.					
™9•5_ 11•5	Drove 1 1/2" 1.D. split type sampler 9.5 to 11.5 ft.		12	S-2	9.5 to 11.5	
	Drove 1 1/2" I.D. solid type sampler 11.5 to 15.0 ft.	Brown, very compact, silty, gravelly, SAND (SN), damp. TILL	80	S <b>-3</b>	11.5 to 15.0	
15.0_ 15.4_	brove 1 1/2" 1.D. solid type sampler-refusal	•	332 10			
	S. Penetration by 30" fall	GROUND WATER READINGS:				
		4-26-77 et 4:00	O PM W	ater at	7.8 ft.	
		4-26 <b>-7</b> 7 at 2 <b>\$</b> 2	5 PH T	ater at	1.2 ft.	
	ALS AND ROCK CLASSIFIED IN WITHOUT LABORATORY ANA-	LOG COMPILED BY:	<u>F</u>	alst	<u>(</u>	

### GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c.p.g.

PROJEC	T: STP Assitions	LOCATION: Tover,	. H. H.			
Boring N	lo. 7-39 Started: 4-2	7-77 Completed: (-27-)	7	Driller:	Jans	
DEPTH	OPERATIONS	MATERIALS CLASSIFICATION	Blows Per Ft. Spoon	Sample No.	Sample Range	% Core Recovery
	Prove 2" I.D. solid you sampler 0.0 to 1.5 ft.	Topsoil	3			
1.5		Brown, compact, silty, gravelly, SAND (SM), damp	132	\$-1	1.5 te	- <sub>1</sub> 0
		Till	109		5.0	
5.0	Prove 1 1/2 Late Edita		126			
	type sampler 5.0 to 8.6 ft. Refusal-100 blows no penetration.		98	+	5.0	
			147	S-2	to 8.6	
8.6 **	Bottom of explorations at refusal.		167			
		en en en en en en en en en en en en en e				
REMAR	KS: Penetration by 30 fell	GROUND WATER READINGS:		. + 0 5	. <b>Ե</b> 1	
		4-27-77 at 10:25				
		4-28-77 at 2:25 P	, —— எ <b>வ</b> தன் (	U.L I	. •	
			p .	·		
MATER FIELD LYSIS.	IALS AND ROCK CLASSIFIED IN WITHOUT LABORATORY ANA-	LOG COMPILED BY:		Jalah		••••••

#### GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c. p. g.

Drove 1½" I.D. X solid type sampl to 5.0 ft.  Drove EX FC casi 5' and washed out  Drove 1½" I.D. X split type sampl to 7.0 ft.	ng to	Dark brown, sandy, Topsoil Brown, loose, slightly silty, fine and medium SAND (SU - SP), moist to wet	14 13 8 9	Sample No.	Sample Range	Dlows/ Cassyn L
brove EX FC casi 5' and washed ou	ng to	Topsoil  Brown, loose, slightly silty, fine and medium SAND (SU - SP), moist to	13 8 9			
Drove EX FC casi 5° and washed ou  Drove 1½" I.D. X split type sampl	2 ft.	silty, fine and medium SAND (SU - SP), moist to	8			
Drove 1½" I.D. X split type sampl	2 ft.		9			
Drove 1½" I.D. X split type sampl	2 ft.			1		
split type sampl			11	1	1 1	
split type sampl		i e		4		
0 7.0 10.			3	S-1	5.0 to	
			4		7.0	
	to 10°					8
and washed out.						9
						13
		color to gray at 11.2'+ with trace of organics	3	S-2	10.0 to 12.0	
Advanced casing	to 15°					17
and washed out.						15
		Gray, loose, gravelly,				26
			11	S <b>-</b> 3	15.0 t	16.0
to 17.0 ft.		(see page 2)	3	S-4	16.0 to	17.0
fall of 140 lb. of and of casing by 300 lb. drive has a weight of hamm	drive hay 18" ammer.	11-22-76 - 11:00 AM - wat	er @ 4		<b>17.</b> 0 ft.	
	Drove 1½" I.D. X split type sampl to 12.0 ft.  Advanced casing and washed out.  Drove 1½" I.D. X split type sample to 17.0 ft.  netration of sam fall of 140 lb. and of casing by 300 lb. drive ha = weight of ham	Drove 1½" I.D. X \$5ft. split type sampler 10.0 to 12.0 ft.  Advanced casing to 15' and washed out.  Drove 1½" I.D. X 2 ft. split type sampler 15.0 to 17.0 ft.  netration of samplers fall of 140 lb. drive he and of casing by 18" 300 lb. drive hammer. = weight of hammer	Drove 1½" I.D. X 85ft. split type sampler 10.0 to 12.0 ft.  Advanced casing to 15' and washed out.  Drove 1½" I.D. X 2 ft. split type sampler 15.0 to 17.0 ft.  Gray, loose, gravelly, SAND (SP), wet  SAND (SP), wet  Gray, loose, gravelly, SAND (SP), wet  Gray, loose, gravelly, SAND (SP), wet  Gray, loose, gravelly, SAND (SP), wet  Gray, loose, gravelly, SAND (SP), wet  GROUND WATER READINGS: fall of 140 lb. drive hammer and of casing by 18" 300 lb. drive hammer  = weight of hammer	Drove 1½" I.D. X \$5ft. split type sampler 10.0 to 12.0 ft.  Advanced casing to 15' and washed out.  Gray, loose, gravelly, SAND (SP), wet  11  Gray, loose, gravelly, SAND (SP), wet  11  (see page 2)  3  metration of samplers fall of 140 lb. drive hammer and of casing by 18" 300 lb. drive hammer.  = weight of hammer  ND ROCK CLASSIFIED IN FIELD WITH-	Drove 1½" I.D. X 55ft. split type sampler 10.0 to 12.0 ft.  Advanced casing to 15' and washed out.  Drove 1½" I.D. X 2 ft. split type sampler 15.0 to 17.0 ft.  Gray, loose, gravelly, SAND (SP), wet  11 S-3 s-4  Metration of samplers fall of 140 lb. drive hammer.  = weight of hammer  Scolor to gray at 11.2'+ gray loose, gravelly, SAND (SP), wet  11 S-3 s-4  GROUND WATER READINGS: fall of 140 lb. drive hammer.  = weight of hammer	Drove 1½" I.D. X 55ft. split type sampler 10.0 to 12.0 ft.  Advanced casing to 15' and washed out.  Gray, loose, gravelly. SAND (SP), wet  11 S-3 15.0 to 17.0 ft.  GROUND WATER READINGS: fall of 140 lb. drive hammer.  wight of hammer  GROUND WATER READINGS: fall of 140 lb. drive hammer.  weight of hammer  GROUND WATER READINGS: 11-22-76 - 11:00 AM - water @ 4.9 ft.

### GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c. p. g.

g No.	A-9 Started:		Com	pleted:		Ē	riller:	b	lows,
тн • 0	OPERATIONS	MATE	ERIALS CLA	SSIFICAT	ION	Blows Per Ft. Spoon	Sample No.	Sample Range	casii XXXX XXX
	Advanced casing to 20° and washed out.	Gray, s	soft, (	LAY	(CL),		-		17 16
.0_	Drove $1\frac{1}{2}$ " I.D. X 2 ft. split type sampler 20. to 22.0 ft.		٠.			0	S-5	20.0 to 22.0	15
	Advanced casing to 25° and cleaned out.								18 18
• O_ • O_	Drove $1\frac{1}{2}$ " I.D. X 2 ft. split type sampler 25. to 27.0 ft.	0	·			0	- _ s-6	25.0 to 27.0	
	Advanced casing to 30° and washed out.								2:
•0_	Drove 1½" I.D. X 5 ft. solid type sampler.30. to 35.0 ft.	0				0 0 0 5	S-7	30.0 to 35.0	20
6.O <u> </u>	Bottom of Exploration per instructions					6			

#### GRANITE STATE EXPLORATIONS

« NODNEY R. ADAMS, c. p. g.

ـــــــــــــــــــــــــــــــــــــ	A-11 Started: 11-18	-76 Completed: 11-19-1	76	Driller: Ad	ams	blows/
тн	OPERATIONS	MATERIALS CLASSIFICATION	Blows Per Ft. Spoon	Sample No.	Sample Range	casing
0_	Drove 1½" I.D. X 5 ft. solid type sampler 0.0	Dark brown, sandy, Topsoil	4			
·	to 5.0 ft.	Brown, loose, fine SAND (SU), moist to wet	6			et e
£	D rove BX FC casing to		8			
Part .	5 ft. and washed out.		10			
5.0_	Drove $1\frac{1}{2}$ " I.D. X 2 ft.		11	_	۳ ۵	
	split type sampler 5.0		4	S-1	5.0 to	
7.0_	to 7.0 ft.		4	_	7.0	
j.	Advanced casing to 10'	pieces of wood in wash				6
3	and washed out.	water (bark?)				8
0.0						7
Canada	Drove $1\frac{1}{2}$ " I.D. X \$5ft. split type sampler 10.0		4	S-2	10.0 to	
2.0_	to 12.0 ft.		5	- 5-2	12.0	
	Advanced casing to 15°			-		13
'i.O	and washed out.					10
		Gray, soft, CLAY (CL),	•			8
5.0	Drove 1½" I.D. X 2 ft.	wet	0/3	+	15.0	
a •	split type sampler 15.0 to 17.0 ft.		2/3	S-3	to 17.0	
7.0			2 1/3			
(1(1(0),,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Penetration of samplers of fall of 140 lb. drive	GROUND WATER READINGS: 7:30 AM, 11-19-76 csg.@	20.	Water		•1
namme	er, and of casing by 18" of 300 lb. drive hammer.	11:00 AM, 11-22-76		Water @		
blo	ws = weight of hammer					
#*************************************						
	AND ROCK CLASSIFIED IN FIELD WITH-	LOG COMPILED BY: RRODE	u			

#### GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c. p. g.

ECT:	STP Addition	LOCATION: Dover,	N. H.	
J No.	A-11 Started:	Completed:	Driller:	blows/
тн <b>-0</b> -	OPERATIONS	MATERIALS CLASSIFICATION		Casing Attack Range 888888
• ~	Advanced casing to 20° and cleaned out.			5
.0_	Drove 1½" I.D. X 2 ft. split type sampler 20.0 to 22.0 ft.		S-4	20.0 to 22.0
	Advanced casing to 25° and cleaned out.			12 10 7
.0_	Drove $1\frac{1}{2}$ " I.D. X 2 ft. split type sampler 25.0 to 27.0 ft.		0 S-5	25.0 to 27.0
	Advanced casing to 30' and washed out.			11 10
.0	Drove 1½" I.D. X 5 ft. solid ltype sampler 30 to 35.0 ft.		5 S-6	30.0 - to 35.0
.0_	Bottom of Exploration per instructions	slightly sandy with some gravel in Clay 33 to 35	2 10	

# RODNEY R. ADAMS, c.p.g. GRANITE STATE EXPLORATIONS

PROJE	CT: Dover STP Additions	LOCATION:	Dover,	N.H.			
Boring I	No. D=1 Started: 5~	-19-78 Completed:	5-10-78	en - qu	Driller:	Holmes	
DEPTH	OPERATIONS	MATERIALS CLASSIFICAT	ION	Blows Per Ft. Spoon	Sample No.	Sample Range	% Core Recovery
5 <b>.⊕</b> _	Drove 1 1/2" I.D. solid type sampler 0.0 to 5.0 ft. Gleaned out to 5.0 ft. with 3" flise augers.	Brown, stiff, CKAY,( moist.	CL),	3 13 33 46 55	S-1	0.0 to 5.0	
7.0	Drove 1 1/2" 1.D. split type sampler 5.0 to 7.0 ft Dleaned out to 10.0 ft. with 3" flite augers.		-	15 17	S <b>€</b> 2		4.
12.0_	Drove 1 1/2" I.D. split type sampler, 19st 0.8 ft. gray clay.	Gray, CLAY (CL), mois Gray, loose, clayey,		6 23	S <b>-</b> 3		
15.0_ 17.0_	Drove 1 1/2" I.D. split type sampler 15.0 to 17.0 3" flite augers	gravelly, SAND (SP&SC moist.	), - -	18 23	S <b>-4</b>		
20.0	Drove 1 1/2" I.D. split type sampler 20.0 to 25.0 3" flite augers		-	18 12			
25.0	Drove 1 1/2" I.D. solid type sampler 25.0 to 30.0 ft.	Loose grading to compa	ict _	18 45 85 106 88			
	Bottom of exploration depth consuliderdesufficient per phone with T. Grumbling	•		- 00			
EMARKS	S:	GROUND WATER READIN 5-19-784		5.8 ft.			
		5-11-787					
	LS AND ROCK CLASSIFIED IN ITHOUT LABORATORY ANA-	LOG COMPILED BY:	4 LU	alsk	<u></u>		

### GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c.p.g.

PROJEC	T: STP Additions	LOCATION: Dover, 1	г.н.			
Boring N	o. <b>D-2</b> Started: 5=	23-78 Completed: 5-24-78	aj e es, mesanjas se se regiment	Driller:	Adams	
DEPTH	OPERATIONS	MATERIALS CLASSIFICATION	Blows Per Ft. Spoon	Sample No.	Sample Range	% Core Recovery
	Drove 5.0 ftl solid type sampler from 0.6 to 5.0	Grayish brown, compact, CLAY, mottled, moist.	8			
	ft. Advanced hole to 5.0 ft.		17		0.0	E chimogeness
	with 3" flite augers		36	S <b>-</b> 1	to	ii qi
			43	Ī	13.5	
5.6		· .	52			
J, 6	Prove 1 1/2" I.D. split type sampler 5.0 to 7.0		14	S <b>-</b> 2	and property.	
7.0_	ft.		23	†		
/ • <del>-</del>	advanced hole to 10.8 ft. with 3" flite augers.				-	Through a series of the series
10.6						Magnetic and second
ч.	Drove 1 1/2" I.D. split type sampler from 10.0 to 12.0 ft.		13			
12.6	Advanced hole from 16.9		19	S-3		
	to 15.9 ft. with 3" flite augers.		-			1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0
	#ngaro.	Brownish gray, soft, CLAY, wet.				1
15.0_	Drove 1 1/2" I.D. split		<u> </u>	1		
	type sampler from 15.9 to 17.0 ft.		3		13.5	
	1/00 100		4	S-4	to 19.€	
REMARK	S:	GROUND WATER READINGS:				
		5-24-787130	WWate	r at 9.6	ft.	
		5-24-78 <b>5:00</b> I	PKWate	r at 9.8	ft.	
	ALS AND ROCK CLASSIFIED IN WITHOUT LABORATORY ANA-	LOG COMPILED BY:	ىئەت	ث	••••••	

## GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c. p. g.

	STP Additions	LOCATION: Dove	r, M.H.						
ng No.	D-2 Started: 5-2	Completed: 5-24-78 Driller: Holmes							
PTH	OPERATIONS	MATERIALS CLASSIFICATION	Blows Per Ft. Spoon	Sample No.	Sample	% C			
7.€_	Advanced hole from 15.0 to 20.0 ft. with 3" flite auger	rs	3,000		Range	Recov			
.e_	Drove 1 1/20 T 2	Grayish brown, compact, gravelly, SAND, wet.			10.0				
	Drove 1 1/2" I.D. split type sampler from 20.6 to 22.6 ft.	Brownish, gray, compact, clayey, gravelly, SAND,	29	S-5	19.8 to 21.0				
.0	Advanced hole from 20.0 to	Wet, glacial Till Grayish brown, compact,	29	S-6	21.0 to				
	25.0 ft. with 3" flite augers.	gravelly, silty, SAND, heavy mottling, wet			24.0				
. @	Draw 1 1/04 T D								
6.0.0	type sampler from 25.0 to 27.0 ft.		34		24.9				
	Advanced hole from 25.8 to 30.8 with 3" flite augers.		45	S-7	to 33.8				
<b>3</b>									
	Drove 1 1/2" 1.D. split type sampler from 30.6 to 32.6 ft.	-	45						
] :	Advanced hole from 30.9 to 35.6 ft. with 3" flite		57	S-8	N. J.				
<del> </del>	Prove 1 1/2" I.D. split								
t	Type sampler from 35.0 to 57.0 ft.		43						
R	efusal to augers at 33.5	+	61	S=9					
	00 blows, 140 lb. hammer., o remetration.								

### GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c.p.g.

PROJEC	T: Dover STP Additions	LOCATION: Dover,	и.н.				
Boring N	o. D-4 Started: 5-1	1-78 Completed: 5-11-78	3	Driller:	olmes		
DEPTH	OPERATIONS	MATERIALS CLASSIFICATION	Blows Per Ft. Spoon	Sample No.	Sample Range	% Core Recovery	
	Drove 1 1/22 I.D. solid type sampler 0.0 to 5.0	Gravel and sand Fill	8				
	ft.		14				
	•	Brown, stiff, CLAY (UL), moist					
	Advanced hole with 3"		17				
	flite augers.	· .		1			
5. <u>@</u>	Drobe 1 1/2" I.D. split type sampler 5.0 to 7.0	Gray, soft, CLAY (CI),	2		5.0		
7.6	ft.		2	S-1	to 10.9		
	3" flite augers						
.0.0				S=2	10.0 to	· ····································	
u <sub>ls</sub>	Drove 1 1/2" I.D. split type sampler 10.0 to 12.0	Grayish brown, soft CLAY (CL), wet, bedded with thin	12		11.0	7	
.2.6	ft.	sand layers.	45	S-3	to		
<b>3.</b> 7	3" flite augers. Refusal ato augers	Brown, loose, clayey, gravelly, SAND, wet.	-		13.7		
	Tried to drive 1 1/2" I.D. solid type sampler. 160 blows-no pentration.						
·	Bottom of exploration at refusal.						
: ≀EMARK	S:	GROUND WATER READINGS:					
		5-11-7812:37					
		स् <b>ate</b>	r at 2.	7 ft.			
	ALS AND ROCK CLASSIFIED IN WITHOUT LABORATORY ANA-	LOG COMPILED BY:	Wal	1h	: 		

RODNEY R. ADAMS, c.p.g.

GRANITE STATE EXPLORATIONS

Boring No	o. <b>B-5</b> Started: 6-6	0-78 Completed: 6-6-78	Driller: Holmes				
DEPTH	OPERATIONS	MATERIALS CLASSIFICATION	Blows Per Ft. Spoon	Sample No.	Sample Range	% Core Recovery	
	Drove 1 1/2", 5 ft. solid type sampler 0.8 to 5.0 ft.	Brownish gray, soft, CLAT, wet.	2				
Part of the Part o	Advanced hole from 5.0 to 5.0 with 3" flite augers.		3			4.	
\$\$\tag{\text{c}}\$\tag	et et		É	S-1	to 6.4		
		· •	5				
			5				
5.0_	Drove 1 1/2" I.D. split type sampler 5.0 to 7.9		3	S <b>-2</b>			
	ft	Grayish brow, soft, CLAY, heavy mottling, set.	5	S <b>-</b> 3	<b>\$.4</b> to 9.1		
9.1	Advanced hole from 5.8 to 9.1 ft. Refusal to augers. 108 blows with 140 lb. drive hammer, no penetration.	(Transition to Claciat Till below)  Brown Till from about 7.1 ft. to 9.1 ft.					
7•1	Bottom of exploration at refusal.						
EMARKS	S:	GROUND WATER READINGS:					
		6-6-783:39	PM Wate	er at 3.6	∌ ft.		
1ATERIA	ALS AND ROCK CLASSIFIED IN VITHOUT LABORATORY ANA-	LOG COMPILED BY:	.Cala				

### GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c.p.g.

oring N	o. D=6 Started: 5-2	22-78 Completed: 5-23-78	.,	Driller: ]	Holmes	
EPTH	OPERATIONS	MATERIALS CLASSIFICATION	Blows Per Ft. Spoon	Sample No.	Sample Range	% Core
	Drove 1 1/2" I.D. solid type sampler 0.6 to 5.0 ft. Advanced hole to 5.0 ft. with 3" flite augers.	Brown, loose, gravelly SAND, Random Fill	6 16 17 17 23			9.
.0	Drove 1 1/2" I.M. split type sampler 5.0 to 7.0 ft. Advanced hole to 10.0 ft. with 3" flite sugers.	Grayish brown stiff, CLAY, moist.	16 3G	S-1	0.0 to 5.3	
.6	Drove 1 1/2" I.D. split type sampler 18.6 to 12.0 ft. Advanced hole to 15.0 ft. with 3" flite augers.	Grayish brown, compact, gravelly, silty, SAND mottled, wet.  Glacial Till	84	S-2	5.3 to 9.9	
.0	Drove 1 1/2" I.D. split type sampler from 15.0 to 17.0 ft. Advanced hole to 20.0 ft. with 3" flite augers.		35 55	S=3	9.0 to 20.3	
.e .e	Drove solid type sampler t 20.3 ft. 100 blows-no penetration.	o •				
EMARI	(S:	GROUND WATER READINGS:  5-23-787:  5-23-784:				

### GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c.p.g.

			• • • • • • • • • • • • • • • • • • • •			D-:!!!-		
Boring N	lo. <b>D-7</b> Sta	rted: 5-1	1-78 Completed: 5	-19-78		Driller:	Adams	
DEPTH	OPERATIONS		MATERIALS CLASSIFICATIO	N	Blows Per Ft. Spoon	Sample No.	Sample Range	% Core Recover
	Drove 1 1/2" I.D. type sampler 0.9 t				3			
	ft.		Randon sandy fill		5			
			*		5			
	Advanced hole with	3"	· <u>.</u>		6	+	0.9	
5 <b>.0</b>	flite augers		-		18			
	Drove 1 1/2" I.D. split type sampler 5.0 to 7.9				20	S <b>-}</b>	to	
7.0	ft.	, • •			23		7.0	
			Grayish brown, soft, SA	ND,				
	Advanced with flit augers.	e	wet.					
9.0								
2.0	Drove 1 1/2" I.D. split type sampler 10.0 to 12.0 ft. Lost sample coming out of hole.		•		2			
		t of hole. ove 1 1/2" I.D. solid		6				
	Drove 1 1/2" I.D. type sampler 12.0				9	S-2 S-3	7.6 to	
	15.0 ft. Advanced with flit	•	Brownish gray, soft, gravelly SAND, wet.		9			
5.0	augers.		Brownish gray, soft, CLAY,	AY,	25		14.0	
	Drove 1 1/2" I.D. type sampler \$5.0	-	mottled, wet.		12		to 16.0	
	17.9 ft.						1000	
EMARKS:			GROUND WATER READING	S:				
			3:30 P#-Wate:	rat 8.4	ft.			
		5-18-787:45 AM-Wate:	r at 8.5	ft.				
		5-19-787:30 AM-Water Cave	r at 7.9 d at 12.					
ATERIAI ELD WI	LS AND ROCK CLASSIFI ITHOUT LABORATORY	ED IN ANA-	LOG COMPILED BY:	4 11	CLL AL	<b></b>		

### GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c. p. g.

	D=7 Started: 5=11-	Started: 5-11-78 Completed: 5-19-7		Driller: Holmes			
<u> </u>	OPERATIONS	MATERIALS CLASSIFICATION	Blows Per Ft. Spoon	Sample No.	Sample Range	% Co Recov	
			20	S-4	16.0 21.0		
	Advanced hole from 17.0 to 20.0 with 3" flite augers						
					and the state of t		
}	Drove 1 1/2" I.D. split type sampler 20.0 to 22.0		18	<b>-</b>	21.0		
$\perp$	ft.	Gray, soft, gravelly, clayey, SAND, sottled, wet.	65	S-5	to 26.6		
	22.0 ft. to 25.0 ft. with flite augers.		·				
щ	Drove 1 1/2" I.D. split type sampler 25.0 to 27.0 ft.	and the boson of the	20	-	26.9		
<u>,</u>	27.0 to 30.0 with flite	Grayish brown, compa t, clayey, gravelly, SAND,	23	S-6	to 50.0		
	augers	Bottled, wet. Glacial Till					
•							
Ť	Drove 1 1/2" I.D. split type sampler 30.0 to 32.0		18				
	ft.		22	_			
	32.0 to 36.0 with flite augers.						
				_			
	Drove 1 1/2" I.D. solid type sampler 36.0 to 41.0 ft.		26	_			

### GRANITE STATE EXPLORATIONS

ODNEY R. ADAMS, c. p. g.

ECT:	STP Additions	LOCATION: Dover,	N.H.			to record for the state of the			
, No.	D-7 Started: 5-11-	.78 Completed: 5-19-7	7 <b>8</b>	Driller: Holmes					
н	OPERATIONS	MATERIALS CLASSIFICATION	Blows Per Ft. Spoon	Sample No.	Sample Range	% Core Recovery			
			31						
			27	•		-			
	*		32	•					
			52	•					
9	Drove 1 1/2" I.D. solid	· •	19	•					
	type sampler from 41.0 to	-		•					
	45.0 ft.		25	-					
	Advanced hole to 45.0 ft. with 3" flite augers.		29	-					
6			39						
	Drove 1 1/2" I.D. solid type sampler from 45.0 to		20						
415	50.0 ft. Lost sample bumping out. Excessive		32						
	bumping dem to hole caving.		32						
			37						
0		•	57						
-	Hole terminated per conversation with Don Stearns.								
			en de cale en la cale						

### GRANITE STATE EXPLORATIONS

RCDNEY R. ADAMS, c.p.g.

PROJEC	T: STP Additions	LOCATION: Dover, N	V.H.			<u> </u>
Boring-N	o. <b>p-9</b> Started: 5-1	9-78 Completed: 5-22-78	a en estas en en estas en	Driller:	Holmes	max.
DEPTH	OPERATIONS	MATERIALS CLASSIFICATION	Blows Per Ft. Spoon	Sample No.	Sample Range	% Core Recovery
	Drove 1 1/2" I.D. sclid type sampler 9.8 to 5.8	Random unconsolidated Fill Gravelly, sand moist	2			1984-43
	ft.	_	5			
		- -	8			<u></u>
		-	5			
5.@ 7.@		-	5		<b>a.9</b> to 9.9	<b>1</b>
	Drove 1 1/2" I.D. split	- -	3	S-1		
	type sampler 5.0 to 7.0 ft.	_	4			
1 4 4	Advanced hole from 7.0 to 10.0 with 3" flite augers.	,				Land and the state of the state
10.0_	Modernoter (*)	Grayish black, soft, sandy, SILT, moist	_		didas, er r	h
th <sub>i</sub> ,	Drove 1 1/2" I.D. split type sampler 10.0 to 12.0 ft.		6	S-2	9.0 to	un il
12.6	Advanced hole from 12.9 to 15.0 ft. with 3" flite augers.				14.0	
15.0		Brownish gray, compact, gravelly, silty, SAND moist Glacial Till				Tel.
	Drove 1 1/2" I.D. split type sampler from 15.6 to	GIEGIEI IIII	19		14.0	
	17.9 ft.		<b>3</b> 5	S <b>-</b> 3	to 17.8	
REMARK	S:	GROUND WATER READINGS:			2100	all the second s
		5-22-788:00	AM Wa	ater at 5	5.2 ft.	And the second second
		5-22-784:36	PM Ti	ater at 5	5.2 ft.	**************************************
						E
						*novel(-mercy-try-community
	ALS AND ROCK CLASSIFIED IN WITHOUT LABORATORY ANA-	LOG COMPILED BY:	<u>vac</u>	sh		

### GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c. p. g.

oring No.	D=9 Started: 5-19-	-78 Completed: 5-22-78	3	Driller:	<u>185</u> 8	
DEPTH	OPERATIONS	MATERIALS CLASSIFICATION	Blows Per Ft. Spoon	Sample No.	Sample Range	% Coi Recove
29.9_ 27.0_	Refusal to augers at 17.8 ft Drove 5.9 ft. solid type sampler from 17.8 to 20.0 ft. Advanced 3" flite augers to 20.0 ft.  Dreve 1 1/2" I.D. split type sampler from 20.0 to 22.0 ft.  Advanced hole to 25.0 ft. with 3" flite augers.  Drove 1 1/2" I.D. solit type sampler from 25.0 to 27.0 ft.					% Con Recove
39 <b>.9</b> _	Advanced hole to 30.0 ft. with 3" flite augers.  Drove 1 1/2" 1.D. split type sampler from 34.0 to	Brownish gray, compact, gravelly, SAND, moist.	35		·	
32.0	32.6 ft.		41	S•7		
34.3	Advanced hole with 3" flite augers. Refusal to augers at 34.3 ft. 190 bloss with 146 lb. hammer on solid sampler-no penetration.					
	Bottom of exploration at refusal.					

### GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c.p.g.

Boring N	o. D <b>-11</b> Started: 6-5-	78 Completed: 6-6-78		Driller:	Holmes	
DEPTH	OPERATIONS	MATERIALS CLASSIFICATION	Blows Per Ft. Spoon	Sample No.	Sample Range	% Core Recover
	Drove 1 1/2", 5 ft. solid type sampler from 0.6 to 5.6 ft. Advanced hole from 0.0 to 5.0 with 3" flite augors.	Grayish brown, compact, CLAY, barely moist.	4 11 29 43	S <b>-1</b>	e.e to 24.5	T a
7.e	Drove 1 1/2" I.D. split type sampler 5.0 to 7.0 ft. Advanced hole from 5.0 to 10.0 with 3" flite augers.		57 15 31	5-2		
6.0	Drove 1 1/2" I.D. solit type sampler 10.0 to 12.0 Advanced hole from 10.0 to 15.0 with 3" flite augers.  Drove 1 1/2" I.D. split type sampler 15.0 to 17.0 ft.	Recoming more moist	14 29 11 17	S-3		
<b>0.0</b>	Advanced hole from 15.0 to 20.0 with 3" flite augers.  Drovell 1/2" I.D. split type sampler 20.0 to 22.0  Advanced hole from 20.0 to 25.0 with 3" flite augers.		7 10	S+5	9.8 to 24.5	
REMAR	KS:	GROUND WATER READINGS:				
	IALS AND ROCK CLASSIFIED IN	6-6-787:30	AM Wat	,	3.8 ft.	

### GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c. p. g.

oring No.	D-11	6-5-78 Completed: 6-6-78					Driller: Holmes				
)EPTH	OPERATI	ONS		MAT	ERIALS CLASSIFICA	ATION	Blows Per Ft. Spoon	Sample No.	Sample Range	% Cor Recove	
25.0	Drove 1 1/2" I. type sampler fr 27.9 ft.			Browmish wet	gray, soft	, CLAY,	7	s-6	24.6 to		
30.0	Advanced hole f 30.0 with 3" fl	-	- 1	•9					31.8		
32.0	Drove 1 1/2" I type sampler 3				gray, compa		6 73	S <b>-7</b>	31.0 to		
35.0	Advanced hole to 35.0 with 3 augers.	-		silty, g	ravelly, SAN Till	D. Wet			34.5		
37.9	Drove 1 1/2" I type sampler 3! ft.	.D. split 5.0 to 37	.0	gravelly Mottled,	brown, compa, silty, SAW wet, glacia	D. l till.	53 87	S <del>-</del> 8	34.5 to		
*N <sub>1</sub>	Refusal to aug ft. Drove 1 1/2 solid type sam 40.0. Advanced	pler 37.1 hole from	to		gray, comparavelly, SAM		21 <b>9</b> 83	S <b>-</b> 9	37.1 37.1 to		
40.5	Drove 1 1/2", 5 type sampler 46 ft.	ft. sol	id				97 87 11 <b>e</b>		59.0		
	Advanced hole 1 45.0 with 3" fl		1				161	S-10	37.1 to		
45.0	Drove 1 1/2", 5 type sampler 45 ft.						115 52 63		50.0		
							91	S-11			
50.0	Operations term 50.0 ft. per im from Paul Killi	struction					131				

RODNEY R. ADAMS, c.p.g.

MATERIALS AND ROCK CLASSIFIED IN FIELD WITHOUT LABORATORY ANA-

LYSIS.

GRANITE STATE EXPLORATIONS

CHARLESTOWN, N. H.

LOCATION: Dover, N.H. PROJECT: Dover STP Additions Driller: Completed: 5-8-78 Adams Started: 5-8-78 Boring No. D-12 Blows Per Ft. Spoon Sample Range Sample No. % Core MATERIALS CLASSIFICATION Recover **OPERATIONS** DEPTH 6 Brown, stiff, CLAY (CL), Drove 1 1/2" I.D. solid 22 0.8 moist. type sampler 0.0 to 5.0 40 S-1 to ft. 61 5.8 Drilled 3" flite augers 58 to 5.0 ft. 5.0 Drove 1 1/2" 1.D. solid type sampler 5.0 to 7.0 ft. 9 5.0 16 S-2 to 7.9 7.0 Drilled 3" flite augers 8.0 to 10.8 ft. Gray, soft, CLAY (CL), wet 10.0 10.9 0 Drove 1 1/2" I.D. split S-3 to type sampler 10.0 to 12.0ft. 12.0 12.9 Drilled 3" flite augers to 15.6 ft. 14.0 Brown, loose, slightly 15.0 15.0 clayey, gravelly, SAND (SP-Drove 1 1/2" I.D. split 22 S-4 to type sampler 15.0 to 17.0 SC). wet. 17.0 17.9 Drilled 3" flite augers to 20.0 ft. 20.0 Drove 1 1/2" I.D. solid <del>2</del>5 20.0 type samples 20.0 to 25.0 40 S-5 ft. Drove BX-FC casing to to 55 24.5 25.0 ft. and washed out. 24.5 <del>3</del>5 Gray, medium compact, 25.0 AG gravelly, clayey, SAND (SC), Drove 1 1/2" I.D. solid 25.0 72 moist. Bassl Till type sampler to 24.6 ft. 5-6 74 to Advanced casing to 30.0 30.0 52 ft. and mashed out. 62 30.9 REMARKS: Penetration of samplers GROUND WATER READINGS: by 30" fall of 140 lb. hauner 5-9-78--12:39 AM of casing by 24" fall of 390 lb. Water at 0.0 ft. hammer. 5-10-78--7:39 AM Water at 4.1 ft. 5-10-78--4:22PM Water at 4.7 ft. 5-11-78--7:39 AM

water at 4.2 ft.

### GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c. p. g.

DJECT:	Dover STP Additions	LOCATION: Dover,	N.H.	
ing No.	D-12 Started: 508	-78 Completed: 5-10-78	<b>3</b> Driller:	Adams
EPTH	OPERATIONS	MATERIALS CLASSIFICATION		mple Sample % Co Io. Range Recove
35.0	Drove 1 1/2" I.D. solid type sampler 30.0 to 35.9 ft. Advanced casing to 35.0 ft and washed out.	•	35 42 57 67 86	30.9 to 25.9
49.0	Drove 1 1/2" I.D. solid type sampler 35.0 to 40.9 ft. Advanced casing to 40.0 ft and washed out.	Gray, medium compact, gravelly, sandy, CLAY (CL), moist. Basal Till	23	35.9 to 48.8
45.0	Drove 1 1/2" I.D. solid type sampler 40.0 to 45.0 ft. Advanced casing to 45.0 ft and washed out.		16 25	<b>40.8</b> <b>to</b> <b>45.0</b>
48.2	Drove 1 1/2" I.D. solid type sampler to refusal at 48.2 ft. 100 blows-no pene- tration. Bottom of exploration at		26 40	45.0 to 48.2
:	refusal.			
	-			

# GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c.p.g.

orina N	o. <b>E-1</b> Started: <b>6-1</b>	-78	Completed:	5-2-78	with section of the section.	Driller: F	lolmes	
EPTH	OPERATIONS		ALS CLASSIFICATION	ON	Blows Per Ft. Spoon	Sample No.	Sample Range	% Core Recovery
	Drove 1 1/2" 5 ft. solid	0.5 Blac	ck,topsoil, moi	ist	6			
·	type sampler from 6.0 to 5.0 ft. Advanced hole from 6.0 to 5.0 ft! with 3" flite augers.	Grayish CLAY, me moist.	brown, compact ottled, slight	t, Ly	9 25 42 59	S <b>-1</b>	0.5 to 17.5	- p
7.6	Drove 1 1/2" split type sampler from 5.0 to 7.0 ft.		٠.		20	S-2		
-	Advanced hole from 5.9 to 16.8 ft.							
3. <b>6</b> _	Drove 1 1/2" I.D. split type sampler from 10.0 to 12.0 ft.	Bécomin	g more moist	-	13 24	S-3		
ilų.	Advanced hole from 10.0 to 15.0 ft. with 3" flite augers.			-				
7.0	Drove 1 1/2" I.B. split type sampler from 15.9 to 17.9 ft.			•	7	S-4		
	Advanced hole from 15.6 to 20.6 ft. with 3" flite augers.	Gray, s	oft CLAY, wet.					
<b>.</b> .e	Drove 1 1/2" I.D. split type sampler from 20.0 to 22.0 ft.				5	s-5	17.5 to 21.2	
MARI	(S:	GROU	JND WATER READI		wt	10 E	£‡	
•••••			6-2-78	AM wci}	arter	a.	L U .	
ATER IELD YSIS	IALS AND ROCK CLASSIFIED IN WITHOUT LABORATORY ANA-	LOC	G COMPILED BY:	) 1.	Vala	K		

# GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c. p. g.

ring No	E-1 Started:	€-1-78	Completed:	f 0 55		Driller:		
	1	1	Completed.	6-2-78		Driller:	Holmes	
EPTH	OPERATIONS	M	ATERIALS CLASSIFICAT	Ю	Blows Per Ft. Spoon	Sample No.	Sample	% Cor
22.0			h brown, compac		1 300011	1 140.	Range	Recove
	Advanced hole from 20.0 25.9 ft. with 3" flite augers.	1 -	ly, silty, SANI mg, wet.	), heavy				
25.0			æ					
	Dreve 1 1/2" I.D. split type sampler from 25.0 to	>			23	\$ <del>-</del> 6	21.2	
27.0_ 60.6	Advanced hole from 25.0 to 30.0 ft. with 3" flite augers.	;o	* <u>.</u>	•	02	3-0	to 33.€	
2.6	Drove 1 1/2" I.D. split type sampler from 39.8 to 32.6 ft.			-	15 21	S-7		
5 <b>.0</b>	Advanced hole from 30.0 t 35.6 ft. with 3" flite augers	Brownish	n gray, compact gravelly, SAMD,					
T	Brove 1 1/2" I.D. split type sampler from 35.0 to 37.0 ft.			<del> </del>	37 53	S-8	33. <b>₽</b>	
ê.6_	Advanced hole from 35.0 t 48.6 ft. with 3" flite augers.	0					50.0	
≥.0_	Drove 1 1/2" 1.D.split type sampler from 49.0 to 42.0 ft.				55 156	S-9		
5.0	Advanced hole from 40.0 to 45.0 ft. with 3" flite augers.							
	Drove 1 1/2" 5ft. solid type sampler from 45.0 to 50.0 ft.			+	75 105 161	S-10		
.0				+	162			
	Hole terminated at 50.0 ff per instructions from Jay Grumbling and Don Stearns.							

# GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c.p.g.

PROJECT	T: STP Additions	LOCATION:	Dover, N.1	· ·		
Boring No	o. E=3 Started: 5=3	1-78 Completed: (	6-1-78	Driller: 1	dens	
DEPTH	OPERATIONS	MATERIALS CLASSIFICATIO	N Blo Per Spo	Ft.   Sample	Sample Range	% Core Recover
	Drove 1 1/2" I.D. solid type sampler from 0.0 to 5.0 ft. Advanced hole from 0.0 to 5.0 ft. with 3" flite augers.	Grayish brown, compact CLAY, mottled, slightledist.	у	8 12 21 S-1 39 55	9.0 to 16.0	
7.9_	Drove 1 1/2" I.D. split type sampler 5.0 to 7.0 ft. Advanced hole from 5.0 to 10.0 ft. with 3" flite augers.	· <u>.</u>		26 47 S-2		
2.0_	Drove 1 1/2" 1.D. split type sampler 10.0 to 12.0 ft.  Advanced hole from 16.0 to	Becoming moist		13 16 S-3		
15.6 17.0	Drove 1 1/2" I.D. split type sampler from 15.0 to 17.0 ft.  Advanced hole from 15.0 to 20.0 with 3" flite augers	Grayish brown, compact silty, gravelly, SAND, moist, heavy mottling.	,	12 32 S-4	16.9 to 28.1	
26.6	Drove 1 1/2" I.D. solid type sa pler from 20.0 to 25.0 ft. Advanced hole from 20.0 to 25.0 with 3"			54 83 S-5	16.8 to 28.1	
REMARK	flite augers.	·	30 AM Wat	ter at 15.5 ter at 15.9	-	
	ALS AND ROCK CLASSIFIED IN WITHOUT LABORATORY ANA-	LOG COMPILED BY:	y Lo	alch	·······	

# GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c. p. g.

'OJECT:	STP Additions		LOCATION: Dover,	N.H.			
oring No.	E-3 Storted: 5-31	. <del>-</del> 78	Completed: 6-1-78		Driller: Ho	olmes	
PEPTH	OPERATIONS		MATERIALS CLASSIFICATION	Blows Per Ft. Spoon	Sample No.	Sample Range	% Co Recove
7	glow-states			129	-		·
25.0	• •			167			
	Drove 1 1/2" 5ft. so id	7		67			
ŭ	type sampler from 25.0 to 28.1 ft. Refusal		·	216	S-6		
28.9		1	· .	389	_		
	100 blowsno penatration 140 lb. hammer.						
-	•		· ·				
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3							
7							
414.							
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1			•				
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# GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c.p.g.

PROJEC	T: STP Additions	LOCATION: Dover, N.	H.			
Boring N	o. <b>E-4</b> Started: 5-2	25 <b>-78</b> Completed: 5-25-78	. get a same of many point	Driller: 1	lolmes	
DEPTH	OPERATIONS	MATERIALS CLASSIFICATION	Blows Per Ft. Spoon	Sample No.	Sample Range	% Core Recovery
	Drove 1 1/2" I.D. solid	Black, topsoil, moist	8			
·	type sampler 0.6 to 5.6 ft.	Grayish brown, stiff CLAY, slightly moist.	23	,		
	Advanced hole from 6.0 to 5.0 ft. with 3" flite	-	7.4	6.3	0.5	
	augers.		34	S-1	to 26.0	*
			59			
5 <b>.</b> @		· .	80			
<i>)•</i> ₩ <u></u>	Drove 1 1/2" I.D. split	•	19	S <b>-</b> 2		
	type sampler 5.6 to 7.0 ft.		36			
7.0_	Advanced hole from 5.0			-		
	to 10.9 ft. with 3" flite augers.					
10.6_						
***	Drove 1 1/2" I.D. split type sampler 16.0 to 12.0		29			
12.0	ft.		45	S-3		
	Advanced hole from 10.0 to 15.0 ft. with 3" flite augers.					
15.6						
- J • •	Drove 1 1/2" I.D. split type sampler 15.0 to 17.0		21			
	ft.		28	S-4		
REMARK	\(S:	GROUND WATER READINGS:				
		5-26-787:15 AM	No wa	ter		
		Hole caved	at 26.8	ft. We	t	-
••••						
FIELD	ALS AND ROCK CLASSIFIED IN WITHOUT LABORATORY ANA-	LOG COMPILED BY:	LUa	Esh		
LYSIS.	•	·				

# GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c. p. g.

OJECT:	STP Additions	LOCATION: Dover,	N.H.			
ring No.	E-4 Storted: 5-	25-78 Completed: 5-25-78		Driller: Ac	lams	
EPTH	OPERATIONS	MATERIALS CLASSIFICATION	Blows Per Ft. Spoon	Sample No.	Sample Range	% Co Recov
17.0_	Advanced hole from 15.0 t 20.0 ft. with 3" flite augers.	0				
0.9	Drove 1 1/2" I.D. split type sampler from 20.0 to 22.0 ft.	Becoming more moist	16			
22.6	Advanced hole from 20.0 t 25.0 ft. with 3" flite augers.		39	S-5		
7.9	Drove 1 1/2" I.D. split type sampler from 25.0 to 27.9 ft.	Grayish brown, compact, silty, gravelly, SAND,	18	s-6	26.8 to	
7.2	Refusal to augers 190 blows 140 lb. hazzer, no penatration.	mottled, moist.			27.9	

# GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c.p.g.

DEPTH	OPERATIONS		DI	1		
•		MATERIALS CLASSIFICATION	Blows Per Ft. Spoon	Sample No.	Sample Range	% Core Recover
•	Drove 5.9 ft. solid sample	r Black topsoil, moist	4			
1	from 0.0 to 5.0 ft. Advanced hole from 0.0 to	Grayish brown, stiff CLAY,	16	†	<b>0.</b> 5	
	5.0 ft. with 3 " flite	slightly soist some staining.	32	S-1	to	
	augees.		<b>7</b> 5		24.8	4
5 <b>.0</b>			95			1
	Drove 1 1/2" I.D. split type sampler from 5.0 to		34			
7.6	7.5 ft.	en en en en en en en en en en en en en e	53	S-2		
	Advanced hole from 5.8 to 10.9 ft. with 3" flite					
	augers.	~				
10.0	Drove 1 1/2" I.D. split			+		
	type sampler from 10.0 to	•	33			
12.0	12.0 ft. Advanced hole from 10.0		52	S=3		
46.	to 15.9 ft. with 3" flite					
15.0	augers.					
1)•	Drove 1 1/2" I.D. split	Becoming more moset	15	+		
17.0	type sampler from 15.0 to 17.0 ft.	· · · · · · · · · · · · · · · · · · ·	31	S-4	35 P	
' -	Advanced hole from 15.0	•				
	to 20.0 with 3" flite augers.					
20.0						
	Drove 1 1/2" I.D. split type sampler from 20.0 to		10			
22.0	22.0 ft.		18	S <b>-</b> 5		
EMARKS	S:	GROUND WATER READINGS:	L	1		L
		5-26-784:15 AM	No Wate	er		
		Hole caved at	26.1 ft.	∵et		
•••••						
ATERIA	LS AND ROCK CLASSIFIED IN	LOG COMPILED BY:				

# GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c. p. g.

* OJECT:	STP Additions	LOCATION: Dover,	N.H.			
ring No.	E-6 Started: 5-36	0-78 Completed: 5-26-78	C	<sup>Oriller:</sup> Ho	lmes	
JEPTH −	OPERATIONS	MATERIALS CLASSIFICATION	Blows Per Ft. Spoon	Sample No.	Sample Range	% Core Recover
25.6_	Drove 1 1/2" 5ft. solid type sampler 25.0 to 26.9 ft. At 26.9 ft. 100 blows- no penatration.	Grayish brown, compact, gravelly, clayey, SAND, mottled, wet.	34	s <b>-6</b>	24.8 to 26.9	
1						
g a						
i nh						
1				·		

# GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c.p.g.

Boring N	o. <b>\$-7</b> Started: 5-39	9-78 Completed: 5-31-78		Driller: He	olmes	
DEPTH	OPERATIONS	MATERIALS CLASSIFICATION	Blows Per Ft. Spoon	Sample No.	Sample Range	% Core Recover
7.9_	Drove 1 1/2" 5 ft. solid type sampler 0.9 to 5.0 ft. Advanced hole from 0.9 to 5.0 with 3" flite augers.  Drove 1 1/2" I.D. split type sampler from 5.0 to 7.0 ft. Advanced hole from 5.0 to to 10.0 with 3" flite	Grayish brown, compact, CLAY, mottled, slightly moist  Becoming more moist	7 12 20 45 60 17 24	S-1 S-2	6.5 to 11.2	
2.6	Drove 1 1/2" I.D. split type sampler from 10.0 to . 12.0 ft.  Advanced hole from 10.0 to 15.0 with 3" flite augers.	Grayish brown, compact, gravelty, silty, SAND mottled, wet.	11 95	S-3 S-4	11.2 to 31.2	
5. <b>0</b>	Drove 1 1/2" 5 ft. solid type sampler from 15.0 to 20.0 ft. Advanced hole from 15.0 to 20.0 ft. with 3" flite augers. Drove 1 1/2" I.D. split		34 56 106 152 95	s-5 - - - - - - -	Silver of the Land State of the	
5 <del>-7</del>	type sampler from 20.0 to 22.0 ft.		30			
EMARK	(S:		,	it 15.8 f		
MATERI	ALS AND ROCK CLASSIFIED IN WITHOUT LABORATORY ANA-	LOG COMPILED BY:	Val	24		

# GRANITE STATE EXPLORATIONS

RODNEY R. ADAMS, c. p. g.

Stearns.

rkOJECT	STP Additions	LOCATION:	Dover, N	•Н.			
ring No	5-30 Started: 5-30	2-78 Completed:	5-31-78		Driller:	Holmes	100 100 100 100 100 100 100 100 100 100
DEPTH	OPERATIONS .	MATERIALS CLASSIFICATI	ОИ	Blows Per Ft. Spoon	Sample No.	Sample Range	% Co
2290			1				The Mark
	Advanced hole from 20.0 to 25.0 ft. with 3" flite auger						
<u>.</u>							
25.0_				r.		•	
E 7. U_	Drove 1 1/2" I.D. split	4	+	05	<u> </u>		
27.0_	type sampler from 25.0 to 27.0 ft.		+	25 32	S-7		
	Advanced hole from 25.0 to 39.0 ft. with 3" flite augers.		+	)Z	. 321		
30.0	- angara,						
	Drove 1 1/2" I.D. aplit	-	4				
52.●	type sampler from 30.8 to 32.8 ft.	79		29	S-8	31.2	
	Advanced hole from 38.0 to 35.0 ft. with 3" flite augers.	Brownish gray, compact, silty, gravelly, SAND,	wet	42	S-9	to 56.8	
35.0_							
<b>37.•</b>	Drove 1 1/2" I.D. split type sampler from 35.0 to 37.0 ft.			23 34	S-10		
	Advanced hole from 35.0 to 40.0 with 3" flite augers.		-	<del>/↑</del>	2-14		,
•		~					
9 3	Drove 1 1/2" I.D. 5 ft. solid type sampler from 40.0 to 45.0 ft.	·		<u>32</u> 41			
	Advanced hole from 40.0 to 45.0 with 3" flite augers.		<del></del>	47 63	8-11	31.2 to 50.6	
5.0	1			81			
	Drove 1 1/2" 5 ft. solid type sampler from 45.0 to 50.0 ft.			46 87			
	<b>.</b>			99 97	S-12		
9.9_	Hole tendents at Format		1			1	
	Hole terminate at 50.0 ft. per instructions from Don			* :		: 1	

### APPENDIX C

SUMMARY OF SURFICIAL SOIL SAMPLES, AND TEST PITS AND TEST BORING LOGS BY GZA

# TABLE C-1 Summary of Surficial Soil Samples

Dover Department of Public Works River Street, Dover, New Hampshire

	lotai		Field Test	
Sample #	Depth (ft.)	Composite	Data (ppm)	Soil Description
SS-1	0.5	yes	ΔN	Grav-brown, fine to medium SAND some Silt / Fill)
SS-2	-	yes	Q	Brown, fine to coarse SAND, some Gravel trace Sit (Fill)
SS-3	1	yes	R	Brown, fine to medium SAND some SII 7 (Fill)
SS-4	-	yes	Q.	Brown, fine to coarse SAND and GRAVEL little Silt (Eill)
SS-5	1	yes	QN.	Dark brown, fine to coarse SAND little Sit (Fill)
9-88	1	yes	QN	Brown, fine to coarse SAND little Gravel trace Sit (Eill)
2S-7	0.5	yes	QN	Brown fine to coarse SAND (Fill)
8-88	-	yes	QN	Dark brown fine to coarse SAND some Sit /Eilin
6-SS	_	yes	QN	Dark brown, fine to coarse SAND and GRAVEL little Sit /Eim
SS-10	+	yes	QN	Dark brown, fine to medium SAND and SII T

# Note:

 Surficial soil samples were collected by GZA GeoEnvironmental, Inc. on April 21, 2000 using manual sampling techniques. Soil samples were screened for volatile organic compounds (VOCs) using a TEI 580B Organic Vapor Meter. "ND" indicates no VOCs were detected.

		71	GZA				Dover Public	Work	S			ring N		3Z-1
1	_1	<b>Z</b> 1	Geol	E <mark>nviron</mark> i eers and S	nental, l	nc.	Dover, New Ha					ge: e No.:		
٠,	ontra	etor:	_	Hampshir			Auger/					eck: _		
	rema			pson/Joh		uad	Casing Samp	pler		ROUNDW			ADINGS	
		by: _	J	ay Hodkir	nson		Type: HSA SS		Date 4-10-00	Time		epth	Casing	Stab
		tart/Fin		4-10-00 <i>/</i>			O.D. / I.D.: <u>4-1/4"</u> <u>1-3/</u>		4-10-00	1010		7.8 3.0	13' well	10 mir 11 day
				Exploration			ammer Wt.: 140 lammer Fall: 30		72100			0.0	ven	11 uay
5	> Elet	/.:		Datu			Other: ATV CME 550							
	D (6	<u></u>	Samı	ole Infor	nation	Ţ		L						
Depth	Casing Blows	Na	Pen/	Depth	Blows	Field Test	Sample			Stratum	(S.	Equ	ipment In	stalled
å	ပြီး	No.	Rec.	(Ft.)	(/6")	Data	Description & Classi	ificatio	n	Desc.	Rmks.	F	LUSH MOUN	
		-				(ppm)	Loope dark grov brown fine t	to mod	ium					ONCRETE '
		S-1	24/18	0-2	3-4	0	Loose, dark gray-brown, fine t SAND, trace Silt, little Debris				1	1	1'	FILTER SAND
		<u></u>		ļ	4-7		glass, brick, little Organics.						2' B	ENTONITE
		S-2	24/14	2-4	5-4	0	Loose, dark gray-brown, fine t SAND, some Organics (compre							2" ID
					5-3		Gravel, brick, trace Clay.						3'	SCH. 40 PVC
		S-3	24/3	4-6	3-2	0	Loose, dark gray-brown, fine to SAND, some Clay and Silt. We		um					RISER
5'-					4-4		SAND, Some Clay and Sitt. We	et.		FILL			-	FILTER SAND
		S-4	24/8	6-8	7-8	0	Medium dense, dark gray-brow			,,,,,		3		SAND
					7-8		medium SAND and Silty CLAY clipping and brick. Wet.	, little	leatner					2" ID
		S-5	24/6	8-10	3-4	0	Loose, gray-brown, Silty CLAY	Y, little	Gravel					SCH. 40 PVC
		0.0	24/0	0-10	4-4		and brick. Wet.							SCREEN
10'-		0.0	04/40	10.10		0.4							(0	).01" SLOT) •
		S-6	24/13	10-12	2-2	34	Very loose, gray-brown, Silty ( fine to coarse Sand, little Orga		1				14.4	
					2-4		(2%), newspaper (5%). Wet. S		vood					
							petroleum odor.						13'	
							Bottom of boring at 13 feet be surface.	below (	ground	13'				
15'-							Surface.				ĺ			
107														-
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R 1	. Sr	oil samr	oles were	screene	d for tota	l volatil	e organic compounds (VOCs) u	ısina a	TEL Mode	1 580B Or	ıani	e Vanc	r Meter II	
E   '	re	ference	d to an i	sobutyler	ne -in-air	standar	d. Total VOCs detected are rep							
М	Da	ata" col	umn. "N	ND" indica	ates no V	OCs de	tected.							
A														
R K														
s														

Stratification lines represent approximate boundaries between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.:

GZ-1

	w a	71	GZA				Dover Public Works			ring N ge:		1
C	J	L1	GeoE	nvironn eers and Sc	iental, In	nc	Dover, New Hampshire		File	No.:	224	57
Co	ntrac		New H	-lampshire	e Boring		Auger/ Sampler	oneite		eck: _		Л
For	remar	n:Bo	b Thom	pson/Johr	nny Mich	uad	Casing	GROUNDW Time		R RE	ADINGS Casing	Stab
		by:		ay Hodkin I-10-00 /			O.D. / I.D.: 4-1/4" 1-3/8" 4-10-0	00 1120	8	3.6	14'	10 min
Da Ro	ce Sta rina I	art/Fini .ocatio		xploration			ammer Wt.: 140#_ 4-21-0	00 -		9.6	well	11 days
GS	Elev		12	Datun	n: NGVI	<u>)</u> H	ammer Fall: 30"			<del></del>		
$\vdash$	Г ,	<u> </u>	Samp	ole Inforn	nation		Other: ATV CME 550					
ř	Casing Blows		Pen/	Depth	Blows	Field Test	Sample	Stratum	S.	Equ	ıipment In	stalled
Depth	Cat	No.	Rec. (In.)	(Ft.)	(/6")	Data (ppm)	Description & Classification	Desc.	Rmks.		ROADBOX	
		S-1	24/19	0-2	1-5	0	Medium dense, gray-brown, fine to coarse SAND, some gray-brown Silty Clay, little		1		1'	ONCRETE
					10-7		Gravel, brick.	SAND AND			2'	FILTER SAND
		S-2	24/8	2-4	7-12	0	Medium dense, gray-brown, fine to coarse SAND, little gray Clay, some brick, Gravel.	DEBRIS WITH RIVER				ENTONITE
					7-8			RIVER DREDGINGS			****	2" ID SCH. 40
		S-3	24/11	4-6	6-9	9	Medium dense, dark gray-black, fine to				4.	SCH. 40 PVC RISER -
5'-					10-6	L	coarse SAND, some wood.		1			oun -
		S-4	24/14	6-8	5-4	0	Loose, gray-brown, fine to coarse SAND,	6'				- FILTER
					3-2		little wood, trace Silt.					SAND
		S-5	24/6	8-10	2-2	0	Loose, gray-brown, fine to coarse SAND, little wood, trace Silt.	FINE TO				#-
					3-1	<u> </u>	·	COARSE SAND				2" ID • SCH. 40
10'-		S-6	24/11	10-12	<u> </u>	0	Very loose, gray-brown, fine to coarse SAND, some Silty Clay, trace Organics.	WITH WOOD				PVC - SCREEN
		1			1-2	<u> </u>	סמועט, some only Clay, trace Organics.	(FILL)				0.01" SLOT)
		S-7	24/19	12-14		0	Medium dense, gray-brown, fine to coarse					
		J.,	- 13	<del></del>	9-8	<del>-</del>	SAND, little Silty Clay, trace wood.					
	<del> </del>	S-8	24/12	14-16	8-7	0	Medium dense, gray-brown, fine to coarse	i i	1	- CONTRACT	14'	
15'-	<del>                                     </del>	1 3-8	-7112	. +-10	6-6	Ť	SAND, some peat with Organics.	PEAT		•		-
1	-	<del> </del>			1	<del> </del>	Bottom of boring at 16 feet below ground	d 16'	1			
		<del>                                     </del>	-	<u> </u>	<b>_</b>	1	surface.					
	-	<del>                                     </del>	<u> </u>	<del>                                     </del>			1					
			<u> </u>	<del>                                     </del>	<del>                                     </del>	<del> </del>	1					
20'-	-	<b>_</b>		<del>                                     </del>	<del>                                     </del>	<del> </del>	1					
İ		<b> </b>	<del>                                     </del>	<b> </b>		<b>†</b>	1					
			<del> </del>			<del>                                     </del>	-					
			l		<del>                                     </del>	-	1					
		<del> </del>			<u> </u>		1					
25'-	-	<b></b>	<b> </b>		<del>                                     </del>	<del>                                     </del>	1					-
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		<del> </del>	ļ	<del>                                     </del>	<b></b>	<del> </del>	4					
<u> </u>	<u> </u>	<u> </u>	<u>L</u>	<u> </u>	<u> </u>	1	lillo organia li 0/00 :	Model Foot		nic ''	nor Ma	(0)///*
111	r	referenc	ed to an	isobutyle	ene -in-ai	r standa	tile organic compounds (VOCs) using a TEI I ard. Total VOCs detected are reported in pa	viouel 580B ( irts per millior	rga. ר (pp	m) in	וטקי ivieter the "Field '	τον Μ) Test
E M	1	Data" c	olumn.	"ND" indi	icates no	VOCs	detected.		•			
Α												
R K												
K S								8				_
	ification	n lines repi	esent appro	oximate bou	ndaries betw	veen soil t	ypes, transitions may be gradual. Water level readings have	been made at time	es de	Borin	ng No.:	GZ-2
and ι	ınder co	onditions s	stated. Fluc	tuations of g	roundwater	may occu	r due to other factors than those present at the time measu	Someths were ma				-

		<b>7</b> /\					Dover Public Works						6Z-3
1		<b>4</b> 1	Geol	Environi	mental, I	nc.		e					
C	ontra	ctor:	_				Auger/						
						uad	Casing						
		-					Type,					Casing 8'	Stab 5 min
							0.D. / 1.D.:		-			well	11 days
	-												
_	T						Other: ATV CME 550						
ء	gr s/		<del></del>	T	T	Field							<u> </u>
Dept	Casir Blow	No.	Rec.	1 -	Blows (/6")	Test Data (ppm)	Sample Description & Classification		Stratum Desc.	Rmks.	Equ	ROADBOX	
		S-1	24/16	0.5-2.5	<del> </del>	0		1 <del>.</del>	BANKRUN	1		1'	ONCRETE
	<u> </u>	<u> </u>			<b></b>			<u> </u>	GRAVEL		* **	2' BI	ENTONITE
	L	S-2	24/8	2.5-4.5	<del> </del>	0	some brick and Gravel.	ID,					2" ID SCH. 40
					13-17				FILL			3'	PVC RISER
5' <b>-</b>													FILTER SAND -
ľ		S-3	24/6	5-7	2-2	0	•	1					2" ID
					5-2								PVC
												(0	SCREEN ).01" SLOT)
Contractor:   New Hampshire   Boring   Foreman:   Bob Thompson/Johnny Michuae   Logged by:   Jay Hodkinson   Date Start/Finish:   4-10-00 / 4-10-00   Boring Location:   See Exploration Location Plan   GS Elev.:   28   Datum:   NGVD   No.   Pen/ Rec. (In.)   Pen/ Rec. (In.)     T-16     S-2   24/8   2.5-4.5   9-11   O     Dark brown, fine to coarse SAND, some   Gravel, little Silt.   S-3   24/6   5-7   2-2   O   Dark brown-black, fine to medium SAND, some Gravel with brick. Wet.   Sample   Fill No.:   Fill No.:   Fill File No.:   Check:   <b>⊒</b> ************************************													
10'-							Auger and split spoon refusal at 8 fe		BEDROCK				
							Bottom of boring at 8 feet below grou						
							surface.		İ				
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	cation li	nes repres	ent approxi	mate bound:	aries betwee	n soil tyne	s. transitions may be gradual. Water level readings have	ve been ma	de at times	Т			
and un	der cond	ditions star	ed. Fluctua	tions of grou	undwater ma	y occur de	ue to other factors than those present at the time mean	asurements	were made.	В	oring	<b>No.:</b> G	Z-3

GZA GeoE Engineers/	Environmental, Inc. Scientists			Dover Public				Test Pit No. Page No.	1	TP-1	1
380 Harvey	v Road			Dover, New Ha	mpshire			File No. Checked By:		22457.	00
	r, New Hampshire 031	03									
GZA Rep.	Jay Hodkinso	on	Contractor	Dover Public	n Equipment Works	t		Date	-		0/1999
Weather	Clear, cold		Operator Make	Allan Dews Case	Model	580	Super L	Ground Elev Time Started		See	Plan
VV Catrici	Cicar, cold		Capacity	1/3 cu.yd.	Reach	16		Time Compl			
		0.1					1 61-	T DID		D 11	
Depth		Son	l Description				Sample No.	PID Reading (ppm)	Excav. Effort	Boulders: Count/ Class	Note No.
0 <i>_</i>		Sand F	fill								
1'	<u></u>	Sand Fill soake									
· 2/		Tar	р								
3l											
4'				•				<u> </u>			
5'		Construction De Leather clippings, granite curb		blocks, tarps							
6'—		11 576									
7'											
8'											
9'											
— 10'				***************************************							<u> </u>
— 11'—		River dred	dging				5-1				1
12'-		Clays, wood de	ebris, sand				•				11
13'						•					
14'											
15'		Bottom at 1	5 feet								
— 16' —					·						
Notes:											
1. Groundwa	ter was encountered at 15 fe	et below ground surface.									
	Test Pit Plan	Boulder Class			portions			reviations		OUNDWATE	R
3	10	Letter Size Ra Designation Classific			Jsed 0 - 1	10%	F = Fine M = Mediu	ım		Encountered Not Encounter	ed
, F		A 6" - 1	7"	TRACE (TR.)	U - 1	IU70	C = Coarse V = Very		Elapse		Depth
		B 18" - 3 C 36" and L		LITTLE (LI.)	10 - :	20%	F/M = Fine	to medium	Time t	О	to Ground-
	_	Excavation Effort		SOME (SO.)	20 - :	35%	F/C = Fine GR = Gray		Readir (Hours	_	water
Volume =	NORTH 17 cu. yd.	EEasy MModerate					BN = Brow	/n			
v Olumbe =-	17 cu. yd.	DDifficult		AND	35 - :	50%	YEL ≃ Yel	IUW :			
<i>C:</i>	Z GZA GeoEnviron	montal Inc		I/files/forms/tnlog							

GZA GeoEnvironn	nental, Inc.						Test Pit No.		TP-2	2
Engineers/Scientis			Dover Public V	Vorks			Page No.	1	of	1
			Dover, New Hai	npshire			File No.		22457	.00
80 Harvey Road							Checked By:			
1anchester, New I	Hampshire 03103									····
		- C	Dover Public	n Equipment			Date		12/2	0/1999
GZA Rep.	Jay Hodkinson	Contractor Operator	Allan Dews	VOIKS			Ground Elev	,		e Plan
	Clear cold	Make	Case	Model	580 5	Super L	Time Started			
Weather	Clear, cold	Capacity	1/3 cu.yd.	Reach	16	ft.	Time Compl			
Depth		Soil Description				Sample	PID		Boulders:	
						No.	Reading	Excav.	Count/ Class	Note
0						-	(ppm)	Effort	Class	No.
	Com	d Fill with Cobbles			1					
- 1'-	San	d Fill with Coopies						<u> </u>	<del> </del>	
				ad .	l					_
- 2'										
					l					
- 3'-										
_ 4'								<del> </del>	-	<u> </u>
	Black and white ash with me	etal and glass debris								
5'								<del> </del>	<del> </del>	1
1							ND			2
- 6'-						5-1				1
Glass a	and metal debris with asphalt shingles									1
- / -										
8'								<del> </del>	<del> </del>	<del> </del>
									ļ	
9'	Dottom	of excavation at 8.5 fe	et					<del> </del>	-	
	Bottom	of excavation at 6.5 fc	CL.							
— 10' —										
										ļ
— 11'—							.	1	1	
12'								<del> </del>	<u> </u>	<b>-</b>
								1		
— 13' —								1		
14'								T		
1.51										
15'							1			
16'								+	<del> </del>	
L						<u> </u>				
Notes:		•								
1. Groundwater enco	ountered approximately 8 feet below ground e screened for volatile organic compounds us	surface.	mization detector	alibrated with an	isobutyler	ne-in-air sta	ndard. Reading	s are giver	ı in parts per	
	e screened for volatile organic compounds us D indicates not detected above background.	me a moder 2005 buotou					C	-		
тиноп (ррш). 19	2 majorios nos deteores acore background.									
									CROLBIDA	TED
Test P	Bou	lder Class	P	roportions Used		F = Fine	bbreviations		ĢROUNDWA X ) Encountere	
. 8	Letter Designation	Size Range Classification	TRACE (TR.		0%	M = Me	dium		) Not Encour	
,	Ā	6" - 17"	IRACE (IR.	. U - I	J / U	C = Coa V = Ver		Ela	psed	Depth
3	В	18" - 36" 36" and Larger	LITTLE (LI.)	10 - 2	20%	F/M = F	ine to medium	Tin	ne to ading	to Ground-
3 (	c	-	1				ine to coarse		ading ours)	water
3	i	ation Effort	COME (CO.)	20.5	35%	1 (3R = 13				44 7 4
3 NOI	Excav-	Easy	SOME (SO.)	20 - 3	35%	GR = G	rown	È		
МОИ	Excav.  RTH		SOME (SO.)	20 - 3 35 - 5			rown			

GZA GeoEr Engineers/	nvironmental, Inc.			Dover Public V	Works			Test Pit No. Page No.	1	TP-:	3 1
Linguiter,	Aleitaia			Dover, New Har				File No.		22457	
380 Harvey		*						Checked By:			
Manchester	r, New Hampshire 03103	3									
C			<i>a</i>		n Equipme	ent		ъ.			
GZA Rep.	Jay Hodkinso	n	Contractor Operator	Dover Public V Allan Dews	Vorks			Date Ground Elev			20/1999 e Plan
Weather	Clear, cold		Make	Case	Model	580 Sup		Time Started			e Fian
, , canter	Cicui, com		Capacity	1/3 cu. yd.	Reach	16		Time Comple			
								•		****	
Depth		Soi	ll Description				Sample	PID		Boulders:	
							No.	Reading	Excav.	Count/	Note
0								(ppm)	Effort	Class	No.
		Sand I	Fill								
1'		Ash, brick	t, glass	N. A.							
_ 2' —						i					
2								1777			
— 3'—		•						ND		*	<del> </del>
— 4'—										<del></del>	<u> </u>
5'		Sand F	7111	•							
_ ,											
— 6'—										<b></b>	
										l	
— 7'—		Ash, brick, bottles, rul	bber, metal d	ebris							
8'_			,					ND			
_ 。											
9' <b>_</b> _						-					
						ŀ					
— <sub>10'</sub> —											<del> </del>
— 11'— <u>[</u>							S-1			***************************************	
12'		Bottom of excavati	on at 11.5 fee	ŧ							
										•	
— 13'—											<del></del>
<del></del>											
15'											
— 16' —											<u> </u>
.											
Notes:											
. Groundwater	r encountered 11.5 feet below g	ground surface.									
2. Soil samples	were screened for volatile orga	anic compounds using a Model 580B pho	otoionization det	ector calibrated with	an isobutylen	e-in-air standar	d. Readings ar	re			
given in part	ts per million (ppm). ND indic	cates not detected above background.									
	Test Pit Plan	Boulder Class		Prop	ortions		A bbro	viations	GR	OUNDWATER	
	10	Letter Size Rang			sed		F = Fine			ncountered	
3		Designation Classificat A 6" - 17		TRACE (TR.)	0 -	- 10%	M = Mediur C = Coarse	n		Not Encountered	
	1	B 18" - 36	6"	LITTLE (LI.)	10	- 20%	V = Very		Elapsed Time to		Depth to
	₩	C 36" and La	rger	2.1.122 (2.1.)		1	F/M = Fine F/C = Fine t		Readin	ıg	Ground-
	NORTH	Excavation Effort EEasy		SOME (SO.)	20 -	- 35%	GR = Gray		(Hours	)	water
/olume =	12 cu. yd.	MModerate DDifficult		AND	35	- 50%	BN = Brown YEL = Yello				
		DDimeun		1							
G	GZA GeoEnvironme	ental, Inc.		l/files/forms/tplog.xis							

GZA GeoF Engineers/					Dover Public V Dover, New Har				Test Pit No. Page No. File No.	1	TP- of 22457	1
380 Harvey	7 Road				Dover, INEW Flat	irhsime			Checked By:		22301	
Mancheste	r, New Ha	mpshire 03103										
						n Equipmen	t		Б.			D4 /4000
GZA Rep.		Jay Hodkinson		Contractor	Dover Public V	Vorks			Date			21/1999
				Operator	Allan Dews		500.6		Ground Elev.		Se	e Plan
Weather		Clear, cold	and the second s	Make	Case	Model	580 Sup		Time Started			
				Capacity	1/3 cu. yd.	Reach	16	ft.	Time Comple	rea		
75 .1			Coi	l Description				Sample	PID		Boulders:	T
Depth			30,	ı Description				No.	Reading	Excav.	Count/	Note
									(ppm)	Effort	Class	No.
<del></del>	<del> </del>								1			
			Sand 1	Fill								
l 1'												
		_							ND			2
2'-	1					-ak			1		ļ	
3'			Gray, fine SA	ND, some Sil	, trace Gravel.							<u> </u>
											1	
4'	_								ļ		<b></b>	
- T		wn, fine to medi								ľ		
5' —		ttle Gravel with						S-1	<b></b>			
	debris (i.e	e., granite curbin	ng, bricks, and ash).					3-1				
— 6' —	-							1		-		
									ND	1		1
— <i>7'</i> —	1											
										İ	}	
8'-												
9'—	ŀ		Bottom of excava	tion at 8.6 fee	<b>t.</b>						<u> </u>	
F 9 -	1											
401	]										<u> </u>	
10'												
L 11'-	1							S-1		<u> </u>	<del> </del>	<u> </u>
								3-1			1	
12'-	-									<u> </u>	<del> </del>	<del></del>
	<u> </u>											
13'-	1											
14'-	1											
15' —										<u> </u>		
15 -	1									1		
16'-	4									ļ	-	ļ
10												
	<u> </u>							<u></u>		<u> </u>	<u> </u>	
Notes:												
		red 7 feet below grou						_1 D 2*				
			anic compounds using a Model 580B p	hotoionization de	etector calibrated wit	n an isobutylen	e-in-air standa	ru. Keadings	are			
given in p	arts per milli	on (ppm). ND indic	cates not detected above background.									
<del></del>	Test Pit P	lan	Boulder Class		Pro	portions		Abl	previations	G	ROUNDWAT	ER
	8		Letter Size R			Used		F = Fine			Encountered	
3			Designation Classifi	cation 17"	TRACE (TR.)	0	- 10%	M = Medi C = Coars		ı	Not Encounte	
<u>-</u>	1		A 6" - B 18" -		TETTE (II)	10	- 20%	V = Very		Elap: Time		Depth to
	1		C 36" and		LITTLE (LI.)	10	- 20%		ne to medium ne to coarse	Read		Ground-
	None	,	Excavation Effort		SOME (SO.)	20	- 35%	GR = Gra	у	(Hou		water
Valum	NORTI	i	EEasy MModerate		1		5007	BN = Bro				
Volume =		cu. yd.	DDifficult		AND	35	- 50%	YEL = Ye	IIOW			
<del>                                     </del>												<del></del>
( i	71	GZA GeoEnvironm	nental. Inc.		1/61or/6	de						
			,		I/files/forms/tplog.x	ua						

GZA GeoEn Engineers/So	nvironmental, Inc. cientists		Dover Public	Works		Test Pit No. Page No.	1	TP-5	1
			Dover, New Ha			File No.	1	22457.	
380 Harvey		*		·	Annual Complete Compl	Checked By	:		
Manchester,	New Hampshire 03103								
GZA Rep.	Jay Hodkinson	Comtractor	Excavation  Dover Public	on Equipment		Dete		10/0	
OZA Kep.	Jay Houkinson	Contractor Operator	Allan Dews	WOTKS		Date Ground Elev			1/1999 Plan
Weather	Clear, cold	Make	Case	Model	580 Super L	Time Started		366	Plan
		Capacity	1/3 cu.yd.	Reach	16 ft.	Time Compl			
Depth		Soil Description			Sample	PID	Г	Boulders:	27
					No.	Reading (ppm)	Excav. Effort	Count/ Class	Note No.
_ 0						(FF)		Ciago	110.
_ 1'									
· 1		Sand Fill							
<b>-</b> 2' <b>-</b>	D <i>E</i>	CAND A Cile id				ND			
	Brown, line to coa	arse SAND, trace Silt with co	nstruction debr	S.					
-3'	Park brown, fine to coarse SAND, littl	e Silt with construction debri	s (i.e., bricks w	ith mortar					
	oncrete pieces).		· (, 0.10110	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		ND		ł	
- 4-		•							
_ 5' _									
		Oily Soil			151				
-6'	efusal at 6 feet below ground surface		avation termina	tad at 6 feet		36			
1	erusar at o reet below ground surrace	on apparent foundation. Exc	avation termina	ned at 0 lect.	l				
- <sup>7</sup> '-									
8'									
_ 9' _									
<del>-</del> 10'									
- 11'-					ļ				
— 12'—									
<b>—</b> 13' <b>—</b>									
1.41									
— 14'—									
15'									
- '									
— 16 <sup>1</sup> —									
								1	
otes:						L			
Soil samples	were screened for volatile organic compoun	ds using a Model 580B photoioni:	zation detector cal	ibrated with an isol	butvlene-in-air stand	ard. Readings a	re given in	narts ner	
	). ND indicates not detected above backgro				·	<b>5</b>	0	r	
Groundwater	was not detected.								
Te	est Pit Plan	Boulder Class	Dron	ortions	A1-L-	eviations	GR	OUNDWATER	<del></del>
	8 Letter	Size Range		sed	F = Fine		( )1	Encountered	
3	Designati A	on Classification 6" - 17"	TRACE (TR.)	0 - 10%	M = Mediur C = Coarse	n	(x)1	Not Encountered	
	А	18" - 36"	LITTLE (LI.)	10 - 20%	V = Very		Elapsed Time to		epth
	C	36" and Larger	~1.1115 (bl.)	10 - 2076	F/M = Fine F/C = Fine t		Reading	g G	round-
	1	xcavation EffortEasy	SOME (SO.)	20 - 35%			(Hours)	) w	ater
1					■ BN = Brown	1			
olume =	5 cu. yd. M	Moderate Difficult	AND	35 - 50%	YEL = Yello				

3ZA GeoEn	nvironmental, Inc.							Test Pit No.		TP-6	1
Engineers/S	cientists			Dover Public V Dover, New Har				Page No. File No.	1	22457.0	
80 Harvey	Road	p.,		30,01,110111111				Checked By			
	, New Hampshire 03103										
	T . TT . 41-1		Contractor	Excavatio -Dover-Public	n Equipment			Date		12/2	1/1999
GZA Rep.	Jay Hodkinson		Operator	Allan Dews	YUKS			Ground Elev	·. ·		Plan
Weather	Clear, cold	en en en en en en en en en en en en en e	Make	Case	Model		Super L	Time Started			
			Capacity	1/3 cu.yd.	Reach	16	ft.	Time Compl	eted		
Donth		Sc	oil Description				Sample	PID		Boulders:	
Depth							No.	Reading	Excav.	Count/	Note
_ 0								(ppm)	Effort	Class	No.
- 1'  <sub>1</sub>	Brown, fine to coarse SAl	ND, little Gravel, trace Silt.									
- 2'											-
2								ND			1
- 3'-											
41				•			ار ع				
- + -	Dark brown, fine to coars	e SAND, trace Silt, pockets	of river dredg	ings and some	construction d	ebris.	5-1				
- 5'-											
								ND			
- 6' <del></del>											2
_ 7'—		Bottom of excavation at 7	feet below gro	und surface.							
8'		Dollow of the same and	· ·	ŧ							
-			-								
_ 9'_									<u> </u>		
									<u> </u>		
— 10'—											
<b>-</b> 11' <b>-</b>											
101										ļ	
— 12'—											
— 13' —						.					
1.41									ļ	ļ	
— 14' —									ļ		
15'									<del> </del>	<del>                                     </del>	
— 16'—						Ì					
											<u> </u>
Notes:	10 . 1.05	organic compounds using a Moo	lel 580B photoic	mization detector	alibrated with a	n isobutylen	e-in-air sta	ındard. Reading	s are given	in parts per	
	opm). ND indicates not detect		Ki 300D pilotoic	Mization dolosion				_			
	ater was encountered at 6.5 fe										
	Test Pit Plan	Boulder Class		P	oportions Used		A F = Fine	bbreviations	ı	GROUNDWAT : ) Encountered	
з Г	12	Designation Class	e Range sification	TRACE (TR.		10%	M = Me	dium		) Not Encoun	
, L		A 6	5" - 17" 8" - 36"				C = Coa V = Ver	у	Elap		Depth to
		C 36" a	nd Larger	LITTLE (LI.)	10 -	20%		ine to medium ne to coarse	Tim-	ding	Ground-
	NORTH	Excavation Effort EEasy	t	SOME (SO.)	20 -	35%	GR = G BN = B	ray	(Ho	urs)	water
Volume =	9 cu. yd.	MModerate DDifficult		AND	35 -	- 50%	AET = .				
		DDimicult		i			I		1	ı	

GZA GeoEnvir Engineers/Scie			Dover Public V	Vorks		-	Test Pit No. Page No.	1	TP-7	7 1
	-		Dover, New Han	npshire			File No.		22457.	00
880 Harvey Ro		•					Checked By			
Manchester, Ne	ew Hampshire 03103		Evenuation	Equipment						
GZA Rep.	Jay Hodkinson	Contractor	Dover Public V				Date		12/2	1/1999
<i>32.</i> 1110p.	The state of the s	Operator	Allan Dews	CIND			Ground Elev			Plan
Weather	Clear, 30's	Make	Case	Model	580	Super L	Time Started			
		Capacity	1/3 cu.yd.	Reach	16		Time Compl			
				•						
Depth		Soil Description				Sample	PID	_	Boulders:	
						No.	Reading	Excav.	Count/	Note
_ 0							(ppm)	Effort	Class	No.
										ı
- 1'										
							ND			
- 2'-	Brown, fine to medium	n SAND, trace Silt with co	onstruction debri	S.						***************************************
_ 3'										
- 4'	Bricks, concrete, lea	ther clipping, pockets of	dredge material.							
- 5'-							ND			
- 6'-										
7,										
- 7'-										<u></u>
8'	]	Brick debris with ash					ND			
- 0 -										
_ 9'										
	Botto	om of excavation at 9 feet.								
- 10' <del>-</del>										
- 11'-										
					l				I	
<b>—</b> 12' <b>—</b>										
<b>—</b> 13' <b>—</b>					* 1					
_ 14'					-			- 1	İ	
_ 13 _										
_ 15' _										
								İ		
<b>–</b> 16' <b>–</b>					l					
					I					
ites:							·	1		
	s encountered approximately 9 feet below gr									
	e screened for volatile organic compounds undicates not detected above background		zacion detector calil	nated with an is	sooutylene	-m-air stanc	aru. Keadings a	ue given in	parts per	
пашон (ррш). Т	materies not detected above background	•								
				·						
	Pit Plan Bot	ulder Class	Propo	rtions		Abbi	eviations	GR	OUNDWATE	3
6	Letter	Size Range	Us			F = Fine			Encountered	.1
3	Designation A	Classification 6" - 17"	TRACE (TR.)	0 - 10%	6	M = Medius C = Coarse	11		Not Encountere	
/	В	18" - 36"	LITTLE (L1.)	10 - 20	<sub>%</sub>	V = Very		Elapsed Time to		Depth o
	C	36" and Larger	(21.)	.0 20	.	F/M = Fine F/C = Fine		Readin	g (	Ground-
NO	RTH Excav	ation Effort Easy	SOME (SO.)	20 - 35	%	GR = Gray		(Hours)	) ,	water
	6 cu. vd. M	-Moderate	AND	35 - 509	<sub>26</sub>	BN = Brow YEL = Yell				
	D	Difficult	מאט	33 - 30	′°					
					I					

ZA GeoEnvironmental, Inc.				•			Test Pit No.		TP-8	
gineers/Scientists			Dover Public W				Page No.	1	of	1
		E	Dover, New Ham	pshire			File No.		22457.0	)0
0 Harvey Road							Checked By:			
nchester, New Hampshire 03103	managan and an an an an an an an an an an an an an									
			Excavation	Equipmen	ıt					
ZA Rep. Jay Hodkinson		Contractor	Dover Public W				Date	and a product of the state	12/21	1/1999
Tricp.			Allan Dews				Ground Elev		See	Plan
eather Clear, 30's		-		Model	580 5	Super L	Time Started	l		
clear, 30's		Capacity		Reach	16	ft.	Time Compl		***************************************	***************************************
		Cupacity	175 04.74.	1100001			•			
		oil Description			T	Sample	PID	Γ	Boulders:	
Depth	, , , , , , , , , , , , ,	m Description				No.	Reading	Excav.	Count/	Note
İ	•						(ppm)	Effort	Class	No.
. 0							<del>                                     </del>			
1'					ļ					
	m 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				l					
2'	Bricks and blasted ro	ck nested in sai	ad IIII		l				<del> </del>	
-					l		ND			1
3'						<i>~</i> .	ND		<del></del>	1
					I	51				
41					1					
4"							1			i
- I					1				<b></b>	
5' —					l					İ
										2
6'-	Bottom of excavat	ion at about 6 f	eet.							1
								ļ.		ł
7' —										
1										
- 8'								<del>                                     </del>		
_ 9'								<del> </del>		
							l	1		ĺ
- 10'								<del> </del>	<u> </u>	<b> </b>
- 10							İ	1		
- 11'								<del></del>		<u> </u>
- 11							1	1		
10								<del> </del>		ļ
- 12' <del>-</del>							į	1		
									<u> </u>	<u> </u>
- 13' <del>-</del>							1			
i										ļ
_ 14' <del></del>										
						-				1
<b>–</b> 15' <b>––</b>										
	4						1		1	1
<b>–</b> 16' <b>––</b>								1	1	<b> </b>
-										1
						L	_ I		ــــــــــــــــــــــــــــــــــــــ	<del></del>
es:										
Soil samples were screened for volatile	e organic compounds using a Mo-	del 580B photoior	nization detector ca	librated with	an isobutyler	ne-in-air st	andard. Reading	s are given	in parts per	
million (ppm). ND indicates not detec		-								
Groundwater encountered at 6 feet bel										
Oromiawater enconnected at a reef bei	on ground sarrace.									
			<del></del>						TROUBLES TO THE	CER
Test Pit Plan	Boulder Class			portions		1	bbreviations	1	GROUNDWAT	
8	1	ze Range		Used		F = Fine $M = Me$			) Encountered ) Not Encount	
4	. ~	ssification	TRACE (TR.)	0	- 10%	M = Me				
	1	6" - 17" 8" - 36"				V = Ve		Elap		Depth
$\wedge$		and Larger	LITTLE (LI.)	10	0 - 20%	F/M = I	ine to medium	Tim		to Ground-
	Excavation Effort	-	1		0 0501		ine to coarse	Rea (Ho	ding urs)	water
NORTH	Excavation Effor	•	SOME (SO.)	20	0 - 35%	GR = G		[""		
	MModerate		1275	_	5 500/	BN = B YEL =				
			AND	3.	5 - 50%	1		-		
dume = 7 cu. yd.	DDifficult		1			i			1	

GZA GeoEnvir				Day:- P. 111	F XX7 = -1			Test Pit No.		TP-9	
Engineers/Scie	ntists			Dover Public Dover, New Ha			<del></del>	Page No. File No.	1	of 22457	00
380 Harvey Ro				20101, 110W 11d	рынс			Checked By	:	2243/	.00
Manchester, Ne	ew Hampshire 03103	3									
GZA Rep.	Jay Hodkinson	1	Contractor	Excavation  Dover Public	n Equipment Works			Date		12/2	1/1999
1 10р.	Jay 110dkiii30li	• • • • • • • • • • • • • • • • • • •	Operator	Allan Dews	011/3			Ground Elev	<b>'</b> .		171999 Plan
Weather	Clear, 30's		Make	Case	Model		Super L	Time Started	i		
			Capacity	1/3 cu.yd.	Reach	16	ft.	Time Compl	eted		
Depth		Soil	Description				Sample	PID	T	Boulders:	
			-				No.	Reading	Excav.	Count/	Note
_ 0								(ppm)	Effort	Class	No.
	Brown, fine	to medium SAND, little Silt, s	ome Boulde	rs and construct	ion debris.						
- 1'-											
2'-					*			ND			. 1
							5-1				
- 3'											
- 4'											2
		Bottom of excavat	ion at 4.5 fee	ot							
- 5'-		DORIGHT OF CACGAST	.O.1 41.7.J 100	·L.							
- 6'											
- 7'-											
- 8'											
- 9'-											
- 10'											
- 11'											
- 12'-						ĺ					
- 13'											
- 14'											
_ 15' _						ŀ					
<b>-</b> 16' <b>-</b>											
otes:											
	re screened for volatile o ND indicates not detected	organic compounds using a Model 5	80B photoioni	zation detector cal	ibrated with an is	sobutylene	e-in-air stand	ard. Readings a	re given in	parts per	
	s encountered 4 feet belo										
	,										
Test I	Pit Plan	Boulder Class		Prop	ortions	1	Abbr	eviations	GR	DUNDWATE	₹
9		Letter Size Ran		บ	sed		F = Fine M = Medium			Encountered	t
3		Designation Classifica A 6" - 17	7"	TRACE (TR.)	0 - 109	%	C = Coarse			Not Encountere	ed Depth
		B 18" - 3 C 36" and La		LITTLE (LI.)	10 - 20	%	V = Very F/M = Fine	to medium	Elapsed Time to	t	0
		Excavation Effort		SOME (SO.)	20 - 35	, l	F/C = Fine to GR = Gray		Reading (Hours)	•	Ground- vater
	RTH I.5 cu. yd.	EEasy MModerate				·	BN = Brown		, ====,		
ume =4	1.5 cu. yd.	DDifficult	i	AND	35 - 50	%	YEL = Yello	ow			
					*****						
GZ	GZA GeoEnvironme	ntal, Inc.		I/files/forms/tplog.xl	s						

	vironmental, Inc.			D D-11'- 1	371			Test Pit No. Page No.	1	TP-10 of	1
ingineers/Sc	eientists			Dover Public V Dover, New Har				File No.		22457.0	
00 11 1	ا a		L	Jover, New Har	npsnire			Checked By		22.731.0	
80 Harvey I	New Hampshire 03103										
Tanchester,	New Hampsinie 03103			Excavatio	n Equipmen	nt					
GZA Rep.	Jay Hodkinson	M	Contractor	Dover Public				Date		12/2	1/1999
			Operator	Allan Dews				Ground Elev		See	Plan
Veather	Clear, 30's		Make	Case	Model		Super L	Time Started			
			Capacity	1/3 cu.yd.	Reach	16	ft.	Time Compl	leted		
							0 1-	I DID	1	Boulders:	
Depth		Sc	oil Description			-	Sample No.	PID Reading	Excav.	Count/	Note
							140.	(ppm)	Effort	Class	No.
_ 0								1 41 /			
		Sand	l Fill								
- 1'											
				-	.40						
- 2'		Sand with bu	ilding debris								i ne
_ 3'											
- 7 -								1			
_ 4' _									<u> </u>	ļ	
7 ]											
_ 5'—									<b>-</b>	<del> </del>	
<b>-</b> 6' <b>-</b>							1		<b>†</b>		
l		Layer of asp	halt cuttings				6-1	ND			1
- <sup>7</sup> '		24) 0, 0, 4,	<i>-</i> -				7				
											2
— 8'—		Orange st	tained soil								
_ 9' _									<u> </u>	<u> </u>	
- 97		Gray clay	y and silt							. 1	l
- 10' -							-	ND	<del> </del>		
10		Bottom of excav	vation at 10 fee	t.							l
_ 11' -									1	<del> </del>	
1											
— 12' —										<del>                                     </del>	
— 13' —						*,					
— 14' —											
15'										ļ	<u> </u>
- 13								1			
<u> </u>									<del> </del>	<del> </del>	<del> </del>
										1	
					<del> </del>		<u> </u>				<u> </u>
Notes:	es were screened for volatile org	gania compounds using a Mac	del 580B photojor	nization detector c	alibrated with	an isobutyle	ne-in-air sta	ndard. Reading	s are given	in parts per	
	m). ND indicates not detected a		-								
	er encountered 8.5 feet below g										
	_										
	T . D'. Di						T			GROUNDWAT	FR
	Test Pit Plan	Boulder Class	- Dana	Pr	oportions Used		F = Fine	bbreviations		: ) Encountered	
3	11		e Range ssification	TRACE (TR.)		) - 10%	M = Med	lium		) Not Encount	
٠ ـ	·	A 6	5" - 17"	INACE (IK.)	U	10/0	C = Coar		Elap	sed	Depth
	$\wedge$		8" - 36" nd Larger	LITTLE (LI.)	10	0 - 20%	V = Very F/M = Fi	y ine to medium	Tim	e to	to
		Excavation Effort				0 2*0/	F/C = Fi	ne to coarse	Read (Hot	_	Ground- water
	1		•	SOME (SO.)	20	0 - 35%	GR = Gr BN = Br		(1.0	/	
	NORTH	EEasy					BM = DI	own	-		
Volume =	NORTH  12 cu. yd.	EEasy MModerate DDifficult		AND	3:	5 - 50%	YEL = Y				

GZA Gen	Environmental, Inc.							Test Pit No.		TP-1	1
Engineers				Dover Public	Works			Page No.	1		1
				Dover, New Ha	mpshire			File No.		22457	.00
380 Harve								Checked By	:		
Mancheste	er, New Hampshire 0310	)3							<del></del>		
			_		n Equipment			<b>.</b>			****
GZA Rep.	Jay Hodkinso	n	Contractor	Dover Public	Works			Date			2/1999
177 .1	C1 201		Operator	Allan Dews	34-4-1	500	Comman	Ground Elev		Sec	e Plan
Weather	Clear, 30's		Make	Case 1/3 cu.yd.	Model _	380	Super L ft.	Time Started Time Compl			
İ			Capacity	1/3 cu.yu.	Reach _	10	) It.	i iiie Compi	icieu		
Depth		Soil	Description				Sample	PID	Т	Boulders:	
Deptin		50	Description.				No.	Reading	Excav.	Count/	Note
L 0							1	(ppm)	Effort	Class	No.
<b>├</b> '-											
	1	Sand F	ill								
				, and							
2'											
L 3'—											
Ī _		of cloth, some bricks and asphal	t, leather cli	ppings, some sc	rap metal assoc	iated			]		
L 4'-	with tannery waste.			•			5-1	ND			1
							7 '				
5'—									ļ		
6'—							-				
<del>-</del> 7'											
├─ <sup>8'</sup> ─							ĺ				
9'											
<u> </u>											
10'											
10'-		Grayish blu	e Clay								
11'-											
12'							l				
											2
13'		Bottom of excavat	on at 12 fact	<u> </u>			ł				2
		Dottom of excavat	ion at 15 icci								
14'											
15'											
<del></del> 16'											*****
Notes:											
	es were screened for volatile om). ND indicates not detect	organic compounds using a Model 5 ed above background.	80B photoioni	zation detector cal	ibrated with an is	obutylen	e-in-air stanc	lard. Readings a	are given ir	ı parts per	
<ol><li>No ground</li></ol>	water was encountered.										
	Test Pit Plan			<u> </u>			T		GP.	OUNDWATE	TR
	8	Boulder Class  Letter Size Rar	ige		ortions sed		Abbi F = Fine	reviations	ı	Encountered	ar.
2		Designation Classifica	tion	TRACE (TR.)	0 - 10%	ó	M = Mediu	m		Not Encounter	red
<u> </u>		A 6" - 1 B 18" - 3		(***)	-		C = Coarse V = Very		Elapse	d	Depth
		C 36" and La		LITTLE (LI.)	10 - 20%	6	F/M = Fine		Time to		to Ground
	/	Excavation Effort		SOME (SO.)	20 - 35%	,	F/C = Fine	to coarse	Readin (Hours	_	Ground- water
	NORTH	EEasy MModerate		JOINE (JU.)	20 - 337	v	GR = Gray BN = Brow	n	L		
Volume =	8 cu. yd.	DDifficult		AND	35 - 50%	6	YEL = Yell	ow ?	<u> </u>		
				<u> </u>			L				
	<b>7</b>										
	GZA GeoEnvironn	nental, Inc.		I/files/forms/tplog.xl	s						1

GZA GeoEr Engineers/S	nvironmental, Inc. Scientists		Dover Public W				Test Pit No. Page No.	1	TP-1 of 22457	1
200 77	David	-	Dover, New Han	npshire	·		File No. Checked By:		22457	.00
380 Harvey Manchester	Road , New Hampshire 03103									
THE PROPERTY OF THE PROPERTY O	,			. Equipmen	t					
GZA Rep.	Jay Hodkinson	Contractor	Dover Public W	orks		······································	Date			22/1999
		Operator	Allan Dews	) ( - J - 1	580 Sup		Ground Elev. Time Started		56	e Plan
Weather	Clear, cold	Make Capacity	Case 1/3 cu. yd.	Model Reach	380 Sup	ft.	Time Comple			
		Сараспу		Neach	- 10		Tane compr			
Depth	Sc	il Description				Sample	PID		Boulders:	
Depar						No.	Reading	Excav.	Count/	Note
L 0—							(ppm)	Effort	Class	No.
	C1	T:II					1	İ		
l 1'	Sand	Т.Щ						<b> </b>	<b> </b>	†
	Fine to coarse SAND with contruction and tannery deb	ris, leather clip	ppings, bricks, scr	ap metal. St	rong					
	catchbasin smell.	•	. 0							
3'—										-
_ 3										1
L 4'						S-1		<b> </b>	<u> </u>	<del> </del>
			•			01				
5'	Black soil possibly fr	om catchbasir	n grit.							
	•							<u> </u>	<u> </u>	
6'										
7'—		Class						<del> </del>		
	Grayisl	n Clay								
8'-								<b>†</b>	1	
		*						<u> </u>		
9'-	Bottom of excav	ation at 9 feet								
							-	<del> </del>	-	
10'	¥									
11'							1	<b>†</b>		1
ակ									<u></u>	
12'										
13'								<b>_</b>	<del> </del>	
13										
14'—							·	<del> </del>	1	
15' —								1		1
						1		<b></b>		
16'—									1	1
						<u> </u>			1	
Notes:										
1. Groundwat	ter encountered approximately 4 feet below ground surface.									
								- 1	GROUNDWAT	TD
	Test Pit Plan Boulder Class	D		portions Used		Ab F = Fine	breviations		Encountered	LIK
, -		Range fication	TRACE (TR.)		- 10%	M = Med			) Not Encount	ered
2 _	A 6"	- 17" ' - 36"	1.3.02(11.)			C = Coar V = Very		Elap		Depth
		' - 36" d Larger	LITTLE (LI.)	1	0 - 20%	F/M = F	ine to medium	Tim Read		to Ground-
	Excavation Effort		SOME (SO.)	2	0 - 35%	F/C = Fi	ne to coarse 1y	(Ho		water
	NORTH EEasy MModerate					BN = Bro	own	<del> </del>	Т	
Volume =	8 cu. yd. DDifficult		AND	3	5 - 50%	YEL = Ye	эпом			
	GZA GeoEnvironmental, Inc.		I/files/forms/tplog.x	ie.						
	CLAR COOLAMBORIUM, MC.		n mes/roms/tprog.x							

	Environmental, Inc.				Б			Test Pit No.		TP-	13
Engineers	/Scientists			Dover Publis				Page No.	1	of	1
380 Harve	v Road			Dover, New H	ampsnire			File No. Checked By		22457	.00
	er, New Hampshire 031	03						enconca By			
				Excavati	on Equipment						
GZA Rep.	Jay Hodkins		Contractor	Dover Public	Works			Date			22/1999
Weather	Cl14		Operator	Allan Dews	36 11	500		Ground Elev		Se	e Plan
weather	Clear, cold		Make Capacity	Case 1/3 cu.yd.	Model Reach	380 16	Super L ft.	Time Started Time Compl			
			Capacity	175 ca.yu.	Keach _	10	11.	Time Compi	eteu		***
Depth		Soil	Description				Sample	PID		Boulders:	
							No.	Reading	Excav.	Count/	Note
0								(ppm)	Effort	Class	No.
1'—	Brown fine	e to coarse SAND, trace Silt with	orange stair	ing some hui	ding debris						
	Brown, mil	o to couldo Britab, traco Brit Willi	orange stan	inig, some our	ung deons.		9-1				
2'-											
3'								ND			
J						l				·	
— 4' —		A PART OF THE PART									
- 5'-											
<i>C</i> 1											
- 0 -		Grayish C	lay								
7'											
						1					
8'											
9'		Bottom of excavation	on at 8.5 fee	t.							
_ 9 _						l					
— 10' —											
— 11'—											
131											-
— 12' —											
— 13' <b>—</b>											
						.					
14'											
1.51											
15'											
<u> </u>						l	ľ				1
Notes:							j	L			
	16 1.0		1010 1 . ! . !		**						
	om). ND indicates not detec	e organic compounds using a Model 58	ob photoioni	zation detector ca	inbrated with an iso	obutyiene	-in-air stand	ard. Keadings a	re given in	parts per	
	ter encountered 4 feet below	<del>-</del>									
		B									
	Test Pit Plan		1				· · · · · · · · · · · · · · · · · · ·		T =	OID TO S	
	8	Boulder Class Letter Size Rang	re I		portions Used	ŀ	Abbr F = Fine	eviations		OUNDWATE Encountered	K
3		Designation Classificat	ion	TRACE (TR.)	0 - 10%	,	M = Mediur	n		Not Encounter	ed
L		A 6" - 17' B 18" - 36					C = Coarse V = Very		Elapsed		Depth
-	$\longrightarrow$	C 36" and Lar		LITTLE (LI.)	10 - 20%	6	F/M = Fine		Time to Readin		to Ground-
	NORTH	Excavation Effort		SOME (SO.)	20 - 35%	6	F/C = Fine t GR = Gray	o coarse	(Hours		water
/olume =	NORTH 8 cu. yd.	EEasy MModerate					BN = Brown		<b> </b>	T	
<del>-</del>	,	DDifficult		AND	35 - 50%	6	YEL = Yello			-+	
	-										

	Environmental, Inc.				¥			Test Pit No.		TP-14	
Engineers/	Scientists		1	Dover Publis \				Page No. File No.	1	of 22457.	1
80 Harvey	v Road			Dover, New Har	пряште			Checked By:		42+37.	-
	r, New Hampshire 03103								. v .ma. sa squarente		
					n Equipmen	ıt					~~~~
ZA Rep.	Jay Hodkinson	The second section is a second		Dover Public	Works	,		Date	reduced by a street		2/1999
			Operator	Allan Dews	Model	590	Super L	Ground Elev Time Started		See	Plan
Veather	Clear, cold		Make Capacity	Case 1/3 cu.yd.	Reach	16	ft.	Time Started			
			Cupacity	175 04.74.	1000011						
Depth		Soi	il Description				Sample	PID		Boulders:	
							No.	Reading (ppm)	Excav. Effort	Count/ Class	Note No.
_ 0		· · · · · · · · · · · · · · · · · · ·						(ppin)	Enon	Class	190.
									1		
- 1'	Brown, fine to medium SAN	D with some construction	ı debris, some	e leather clippin	gs, scrap me	etal, bricks					
- 2'	and concrete.										1.
-											. ·
- 3'	1										
- 4'	1			•							
- 5' <del></del>										1	<b></b>
-											
- 6'							ĺ		<del>                                     </del>		
יד							!				
- /	Grayish Cla	ay from river dredging, so	me tannery w	aste. Sheen on	water.						
_ 8'	1						5-1		<b> </b>		
- 9'	-								<del> </del>	<b>†</b>	
<del>-</del> 10' <del></del>	1										
- 11'									<u> </u>		1
-		Glass debris with	river dredgin	10							
<del></del>		Bottom of excava					İ				
— 13' —	]								<u> </u>	<u> </u>	
— 13·—						-					
14'	1					I			+	+	<u> </u>
<u> </u>						İ				1	
<b>—</b> 16' —									<u> </u>		
01											
-4-0-	<u></u>						L	<u> </u>	<del></del>		L
otes:			• • •								
Groundw	vater may be more shallow due to p	resents of clarifyer walls still	intact.								
-	Test Pit Plan			1			т		<del></del>	GROUNDWAT	ER
	10	Boulder Class Letter Size l	Range	Pr	oportions Used		F = Fine	bbreviations	(x	x ) Encountered	
з Г		Designation Classic	ification	TRACE (TR.)		) - 10%	M = Med C = Coar		(	) Not Encount	ered
L			- 17" ' - 36"			0. 200/	V = Very	1	Elap		Depth to
		C 36" and	d Larger	LITTLE (LI.)	10	0 - 20%		ne to medium ne to coarse	Tim Read	ding	Ground-
	NORTH	Excavation Effort EEasy		SOME (SO.)	20	0 - 35%	GR = Gr	ay	(Ho	urs)	water
	1			1			BN = Bro			T	
olume =	13 cu. yd.	MModerate DDifficult		AND	2	5 - 50%	YEL = Y	enow			

	Environmental, Inc.		<del></del>		.a		<del></del>	Test Pit No.		TP-1	5
Engineers	s/Scientists		· · · · · · · · · · · · · · · · · · ·	Dover Publis Dover, New Ha				Page No. File No.	1	of 22457.	1
380 Harve				Dover, New Ha	шрыше			Checked By	:	22457.	00
Manchest	er, New Hampshire 03	103					W				
GZA Rep.	Jay Hodkins	son	Contractor	Excavation  Dover Public	n Equipment			Data		10.0	24.000
l and the p	ay Houking	3011	Operator	Allan Dews	VVOIKS			Date Ground Elev	,		2/1999 Plan
Weather	Clear, cold		Make	Case	Model	580	Super L	Time Started			1 1411
			Capacity	1/3 cu.yd.	Reach	16	ft.	Time Compl	eted		
Depth	1	Soil	Description				Comple	PID		ID . 1.1	
		3011	Description				Sample No.	Reading	Excav.	Boulders: Count/	Note
o		·			· · · · · · · · · · · · · · · · · · ·			(ppm)	Effort	Class	No.
<u> </u>						1					
2'-		Sand				l					
3'											
— 4' —	Fine to coarse S	SAND with some construction de	bris bricks,	concrete, asphal	t, blasted rock.						
<del></del>											
— 6'—											
— 7'—		Sand Fill with bl	lasted rock			l					
8'											
											,
— 9'—		Bottom of excavat	ion at 9 feet.								1
— 10' —						l					
— 11'—							ŀ				
12'											
						l		l		İ	
— 13'—						-					
14'						1	-				
15'						l	1				
_ 13 _											
16'							1				
									1		
otes:										L	
. Groundwate	er was encountered at 8.5 fe	eet below ground surface.									
<del></del>	Test Pit Plan		т			<del>- 1</del>			1		
	12	Boulder Class Letter Size Rang	ge	Propo Us		-	Abbre F = Fine	viations		OUNDWATER incountered	
2		Designation Classificati A 6" - 17'	ion	TRACE (TR.)	0 - 10%		M = Medium C = Coarse	1		ot Encountered	1
		B 18" - 36	"	LITTLE (LI.)	10 - 20%	- 1	V = Very		Elapsed Time to	D to	epth
	7	C 36" and Lar					F/M = Fine to F/C = Fine to		Reading	G	round-
1	NORTH	EEasy		SOME (SO.)	20 - 35%		GR = Gray BN = Brown		(Hours)	w	ater
olume =	8 cu. yd.	MModerate DDifficult		AND	35 - 50%	1	YEL = Yellov				
										<u> </u>	
G	GZA GeoEnvironn	nental, Inc.	1.	/files/forms/tplog.xls							

GZA GeoE	nvironmental, Inc.						Test Pit No.		TP-1	5
Engineers/S			Dover Publis V				Page No.	1	of	1
		)	Dover, New Har	npshire			File No.		22457.	00
80 Harvey							Checked By:			
Manchester 1	r, New Hampshire 03103			T				· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	
		Contracts-	Excavation Dover Public \	n Equipment			Date		12/2	2/1999
GZA Rep.	Jay Hodkinson		Allan Dews	VOIKS			Ground Elev			Plan
** **	Class and	Operator Make	Case	Model	580	Super L	Time Started			7 1 1411
Veather	Clear, cold	- Capacity	1/3 cu.yd.	Reach	16	ft.	Time Compl			
		Capacity					•			
Depth		Soil Description				Sample	PID		Boulders:	
						No.	Reading	Excav.	Count/	Note
_ 0l	•						(ppm)	Effort	Class	No.
_ 11									ļ	
1				_						
_ 2'—	Brown	Sand (virgin)						<b> </b>	<del> </del>	i
								l		
_ '3'							<u> </u>			<b> </b>
										İ
- 4' <del>-  </del>	Dark brow	n Sand (virgin)					***************************************		T	·
		,								
- 5'-										
- 6'-								<u> </u>		ļ
_ 0	Light brov	vn Sand (virgin)								
_ r		17 C D C +	1 1						<del> </del>	<b></b>
	Bottom of excavation a	it 7 feet. Refusai	at bedrock.							ļ
8'								<u> </u>	<u> </u>	<del> </del>
— 9' —	·							<b></b>		
								1		
— 10' —										
									<u> </u>	
— 11' —								1		1
12'								ļ		ļ
- 12										1
13'								<u> </u>		
15										
14'	·					1		<b> </b>	<del> </del>	<del> </del>
						]				
15'								1	<b>†</b>	<del> </del>
						1				
— 16' —						1				]
	and the second s									<u> </u>
Notes:										
	True Ris Blan		<del>T </del>			Γ		1 7	GROUNDWA'	TER
	Test Pit Plan Boulder Cla 6 Letter	ss Size Range		portions Used		At F = Fine	breviations		) Encountered	
з Г	2000	Classification	TRACE (TR.)		- 10%	M = Med			) Not Encoun	
Ľ	A	6" - 17" 18" - 36"	1.3.02 (110)	3		C = Coar V = Very		Elap		Depth
	B C 30	18" - 36" 5" and Larger	LITTLE (LI.)	10	- 20%	F/M = Fi	ne to medium	Tim	e to	to Ground-
	Excavation Ef		COME (CO)	20	- 35%	F/C = Fir GR = Gr	ne to coarse	Read (Hor		water
	NORTH EEasy		SOME (SO.)	20	- 33/0	BN = Bro	own	ļ.	· ·	
Volume =	5 cu. yd. MModera DDifficul		AND	35	- 50%	YEL = Y				
	I Dimoun		1			.1		1	ł	

	Environmental, Inc.		· · · · · · · · · · · · · · · · · · ·		D .			Test Pit No.		TP-1	7
Engineers	/Scientists			Dover Publis Dover, New Ha				Page No. File No.	1	of 22457.	1
380 Harve	ey Road			Dover, New Ha	прыше		*	Checked By	:	22437.	00
Mancheste	er, New Hampshire 03103										
GZA Rep.	Jay Hodkinson		Contractor	Excavation  Dover Public	n Equipme	nt		Date		12/2	2/1999
OZA Rep.	Jay Hodkiisoii		Operator	Allan Dews	WOIKS			Ground Elev	7.		2/1999 Plan
Weather	Clear, cold		Make	Case	Model	580	Super L	Time Started			
			Capacity	1/3 cu.yd.	Reach	. 16	ft.	Time Compl	eted		
Depth	T	Soil	Description		·		Sample	PID	Г	Boulders:	
1			,				No.	Reading	Excav.	Count/	Note
0								(ppm)	Effort	Class	No.
		Brown, fine to co	arse SAND.								
1'											
2'		Yellowish brow	n SAND.								10:
		Brown, fine to co	arse SAND.								
3'			******								
<u> </u>		Reddish SAND with o	range stain	rock.							
5'											
<b>—</b> 6' <b>—</b>		<b>51</b> 6									
-		Blasted rock fragme	nts with brid	CK.							
7'											
8'											
											1
— 9' —		Bottom of excavati	ion at 9 feet	•							
— 10' —											
— 11'—											
12'											
— 13'—											HK-R
14'											
						İ					
— 15' —											
16'											
1											
Notes:						I.				L	
. Groundwat	ter encountered at 8.6 feet belo	w ground surface.									
	Test Pit Plan					— т			<del></del>	OT DESCRIPTION .	
	10	Boulder Class Letter Size Rang	ge .		ertions sed		Abbr F = Fine	eviations	1	OUNDWATE Encountered	•
2		Designation Classificati A 6" - 17'	ion	TRACE (TR.)	0 - 3	10%	M = Mediur C = Coarse	m		Not Encountere	
		В 18" - 36	"	LITTLE (LI.)	10 -	20%	V = Very	to madin	Elapse Time to		Depth O
	$\checkmark$	C 36" and Lar Excavation Effort	ger			1	F/M = Fine t		Readin	g (	Ground- vater
	NORTH	EEasy		SOME (SO.)	20 -	35%	GR = Gray BN = Brown	1	(Hours	<i>,</i> , ,	va(C)
olume =	7 cu. yd.	MModerate DDifficult		AND	35 -	50%	YEL = Yello		<b> </b>		
			1			L		<del> </del>			
G	GZA GeoEnvironmer	ntal Inc		I/files/forms/tules w							

	ronmental, Inc.		_					Test Pit No. Page No.	1	TP-1 of	
Engineers/Sci	ntists			Publis Work New Hampsh				File No.		22457	1 00
80 Harvey R	and		טטעפו,	. Tow manipsi				Checked By:			
	ew Hampshire 03103	A COMMON MARKET CONTROL OF THE CONTR								W. S	
ranonostor, r				xcavation Eq							
ZA Rep.	Jay Hodkinson	Contrac		Public Worl	CS	22 0 0000		Date			22/1999
		Operato				500	- T	Ground Elev		Se	e Plan
Weather	Clear, cold	Make	Case		odel	16	Super L ft.	Time Started Time Compl			
		Capacit	y <u>1/3</u>	cu.yd. Re	ach	10		Time Compi	cica		
Depth		Soil Descrip	otion			<del></del> T	Sample	PID		Boulders:	:[
Бериі		501,255,17					No.	Reading	Excav.	Count/	Note
0								(ppm)	Effort	Class	No.
						1		İ		1	
_ 1'		D. CAND (vicein	`			- 1					
1		Brown SAND (virgin	)			l					
- 2'						l	5-1				
		Orange stained SAND (vi	irgin)				7-1			<u> </u>	
- 3' <del></del>										İ	-
_ 4' _			•							ļ	
_ 5' _										<b>†</b>	<del> </del>
		Brown SAND (virgin	1)							<u>L</u>	
— 6'—			•							T	
7'								<u> </u>		<u> </u>	ļ
- / -											1
8'		C	afraal on b	odrook						<del> </del>	<del></del>
	Bot	ttom of excavation at 8 feet due to r	erusai on o	Barock.				<b>!</b>			
_ 9 _											
<b>—</b> 10'											
_ 11'										-	-
— 12'—									<u> </u>	1	1
— 13'—										T	
14'										<u> </u>	
14											
15'								<u> </u>		-	
<u> </u>										1	
		2.3		·		-					
Notes:											
	est Pit Pian	Boulder Class		Proport	ions		А	bbreviations	- 1	GROUNDWA	
	12	Letter Size Range	ļ	Use	d		F = Fine M = Me			) Encountere x ) Not Encou	
3		Designation Classification A 6" - 17"	TRA	ACE (TR.)	0 - 10	%	C = Coa	irse			Depth
		B 18" - 36"	LIT	TLE (LI.)	10 - 20	0%	V = Ver F/M = F	y ine to medium	Tin	psed ne to	to
	$\leftarrow$	C 36" and Larger  Excavation Effort					F/C = F	ine to coarse		nding ours)	Ground- water
	NORTH	EEasy	SO	ME (SO.)	20 - 3	5%	GR = G BN = B		(110		
Volume =	11 cu. yd.	MModerate DDifficult	AN	D	35 - 5	0%	YEL =				
		DDimoult	- 1				ı		1	ı	

GZA GeoE Engineers/	nvironmental, Inc.		Dover Public	Works			Test Pit No. Page No.	1	TP2-	1
			Dover, New Har				File No.		22457.	
380 Harvey				<del></del>			Checked By:	-	NJN	
Manchester	r, New Hampshire 03103									
GZA Rep.	Jay Hodkinson	Contractor	Dover Public V		it		Date		04/1	1/2000
		Operator	Shawn McClar				Ground Elev			Plan
Weather	Windy, 40s	Make	Case	Model	580 St		Time Started			740
		Capacity	1/3 cu. yd.	Reach	16	ft.	Time Comple	eted	0	745
Domth	T	Cail Dagaria ti		<del></del>		C1	T BID		I	
Depth		Soil Description				Sample No.	PID Reading	Excav.	Boulders: Count/	NI-1-
0						140.	(ppm)	Effort	Class	Note No.
0	Blueish gray, fine to medium SAND with	Cobbles, some Clay. Catchb	oasin grit smell.				(FF7	231011	Ciass	140.
		•	J					E	2A	1
<b>-</b> 1'-								ı		
— 2'—							ND			
			,							
— 3'——										
— 4'—	Black, fine to medium SAND, some Silt, lit	tle Organics								
1	The is median by a come say as	ac organico.								2
<b>-</b> 5' -										
6'							ND			
ŭ	Gray-brown, Silty CLAY, some fine to med	ium Sand.								
— 7'—										
								. ↓		
— 8' <del> </del>	Bottom of test pit a	at 8 feet below ground surfa	ace. No refusal.							
9'		0 - · · · · · · · · · · · · · · · · · ·								`
_ 9 _										
— <sub>10'</sub> —										
10										
— 11'—										
										ı
12'							l			
101										
— 13'—					l					
— 14'—					j	:				
					l					
— 15' —							<del></del>			
					l					
— 16'					l					
Notes:										·····
in-air st	nples were screened in the field for volatile orga andard. Results are reported in the "PID Readir water was encountered at a depth of 4.5 feet bel	g (ppm)" column in parts per				erence to an	isobutylene-			
		oulder Class	Prope	ortions		Abbre	viations	GR	OUNDWATER	
	7' Letter	Size Range	U	sed		F = Fine			Encountered	1
3'	Designation A	Classification 6" - 17"	TRACE (TR.)	0 - 1	0%	M = Medium C = Coarse	n .	1	Not Encountered	
	<b>∕</b> 1 B	18" - 36"	LITTLE (LI.)	10 - 2	20%	V = Very		Elapsed Time to		Depth o
	,	36" and Larger ration Effort				F/M = Fine F/C = Fine		Readin	g (	Ground-
	NORTH E		SOME (SO.)	20 - 3	35%	GR = Gray		(Hours)	) v	vater
olume =	6.2 cu. vd. M	Moderate Difficult	AND	35 - 3	50%	BN = Brown YEL = Yellov		0.1	15	4.5'
		Dimodit	L							
G	GZA GeoEnvironmental, Inc.		I/22457/tp/tp1-5.xls							1

ZA GeoEnvironmental, Inc.			ii ·		Test Pit No.		TP2	
ngineers/Scientists		Dover Public Wo			Page No.	1	of	1
	Γ	Dover, New Hamp	shire		File No.		2245	
80 Harvey Road					Checked By	·	NJ	N
Ianchester, New Hampshire 03103	· · · · · · · · · · · · · · · · · · ·							
		Excavation I			Date		04/	11/2000
ZA Rep. Jay Hodkinson		Dover Public Wo	IKS		Ground Elev	7		ee Plan
	Operator Make		Model 58	0 SuperL	Time Started			0850
Windy, 40s				16 ft.	Time Comp			0900
	Capacity	173 cu. yu.	Cacii	10 11.	Time Comp.	icicu		0,00
Depth	Soil Description			Sample	PID	T	Boulders	:
Бериг	Boll Bosonphon			No.	Reading	Excav.	Count/	Note
					(ppm)	Effort	Class	No.
Brown, fine to coarse SAND, trace Silt.								
						Е		
- 1'							İ	
Dark brown, fine to medium SAND, little Sil	i.	*						
2'								
Brown, fine to coarse SAND, little Silt.							ļ	1
-								
- 4'	•	•				<del>                                     </del>	-	
Gray-blue, Silty CLAY. (FILL)					ND			2
- 5'				S-1	IND	1-1-	<del> </del>	+
Ţ	eather clippings			3-1			ļ	3
Bottom of test pit at 5.8	11 0	face No refusal						<del>                                     </del>
Bottom of test pit at 3.6	reet below ground sur	lace. No relusar.					1	
_ 7'						<b> </b>		
					ŀ			
<b>–</b> 8' <b>–</b>								
							1	
- 9'-								
— 10' —								
111								
- 11'								į
— 12'—						<del> </del>	<del> </del>	_
_ 12 _								
— 13'—				.			ļ	_
14'					ļ		<del> </del>	<del>- </del>
15'					<del></del>		1	
						1		
— 16' —						1	1	
lotes:								-
<ol> <li>Soil samples were screened in the field for volatile in-air standard. Results are reported in the "PID F</li> <li>Groundwater was encountered at a depth of 4 feet</li> <li>Test pit terminated due to collapsing walls.</li> </ol>	Reading (ppm)" columr	n in parts per mill	I Model 580B C	Organic Vapor es no VOCs de	Meter referented.	nce to an i	isobutyler	ie-
Tost pic terminated due to contapoing wants.								
					·			
Test Pit Plan Boul	der Class	Ргор	ortions	А	bbreviations		GROUNDW	
9.5 Letter	Size Range		sed	F = Fine			X) Encounte	
	Classification 6" - 17"	TRACE (TR.)	0 - 10%	M = Me C = Coa			) Not Enco	
3.1 Designation	6" - 17" 18" - 36"	LITTLE (1)	10 200/	V = Ver	у		osed ne to	Depth to
3.1 Designation A B		LITTLE (LI.)	10 - 20%		ine to medium		ding	
3.1 A	36" and Larger			E/C E	ine to coorce			Ground-
A B C Excava	36" and Larger		20 - 35%	F/C = F GR = G	ine to coarse ray		ours)	water
NORTH EE	36" and Larger ation Effort asy	SOME (SO.)		GR = G BN = B	ray rown		ours)	water
NORTH EE	36" and Larger		20 - 35% 35 - 50%	GR = G BN = B	ray rown		-	

GZA GeoI Engineers/	Environmental, Inc.			Dover Public	Works		Test Pit No. Page No.	1	TP2- of	3
		Vice and the state of the state		Dover, New Ha			File No.	1	22457.	00
380 Harve		* *		**************************************		<del></del>	Checked By	:	NJN	
Mancheste	er, New Hampshire 03	103					·			
CZA P	7 77 11 '				on Equipment		_			
GZA Rep.	Jay Hodkins	son	Contractor	Dover Public			Date			1/2000
Weather	Windy, 40s		Operator Make	Shawn McCla Case		`T	Ground Elev			Plan
vveatilei	Willdy, 40s		Capacity	1/3 cu. yd.	Reach 16	SuperL ft.	Time Started			810
			Сараспу	173 cu. yu.	Reach 10	11.	Time Comp	etea		815
Depth		So	il Description	i		Sample	PID	Γ	Boulders:	
-			•			No.	Reading	Excav.	Count/	Note
0							(ppm)	Effort	Class	No.
	Light brown, fine to m	nedium SAND, little Silt.								
								Е		
,								ī		
2'	Gray-brown, fine SAN	ND and Silt.								
3'							ND			1, 2
— 4'—			٠.							
— 5'—	Dark brown fine to co	parse SAND, some gray Clay, le	ather clipping	s (10-15%) woo	od (5-10%)					
i	2 0.0, 0.0	and on many, come gray enay, re	unioi oripping	3 (10 1370), 110	od (3-1070).					
— 6'—						S-1				
7'							ND			3
_ / _		Bottom of test pit at 7 feet below	w ground surf	ace. No refusal.						
8'										
-										
9'										
										*****
— 10' <del>-</del>										
— 11'—										
— 12' —										
13'										
.,,										
<del></del> 14'										
15'										
_ 13										
— 16' <b>—</b>										
Notes:										
		in the field for volatile organic c						e to an isc	butylene-	
		reported in the "PID Reading (p		in parts per mill	ion. ND indicates no	VOCs dete	cted.			
	idwater was encountere pit terminated due to co	ed at a depth of 4 feet below gro	und surface.							
J. Test p	on reminiated due to co	mapsing wans.								
	Test Pit Plan	1						T	OUNDWATER	
	10	Boulder Class Letter Size Ra	ange		ortions sed	Abbro F = Fine	eviations	1	OUNDWATE! Encountered	
4		Designation Classific	ation	TRACE (TR.)	0 - 10%	M = Mediun	n		Not Encountered	d
L	I	A 6" - 1		(110)		C = Coarse V = Very		Elapsed	ı I	Pepth
	$\rightarrow$	C 36" and L	1	LITTLE (LI.)	10 - 20%	F/M = Fine t	to medium	Time to	, to	)
		Excavation Effort		SOME (SO.)	20 - 35%	F/C = Fine to	o coarse	Reading (Hours)	-	Fround- vater
	NORTH	EEasy		SOME (SO.)	20 - 33%	GR = Gray BN = Brown	1 /	(220013)		
olume =	10.4 cu. yd.	MModerate DDifficult		AND	35 - 50%	YEL = Yello		0.0	7	4'

ZA GeoEnvironmen	tal, Inc.					Test Pit No.		TP2-	
ngineers/Scientists			Dover Public Works			Page No.	1	of	1
		De	over, New Hampshire			File No.		22457.	
80 Harvey Road						Checked By:		NJN	
fanchester, New Han	npshire 03103		par macana and a constraint a grant and						
		0 1	Excavation Equip			Date		04/1	1/2000
ZA Rep.	lay Hodkinson		Dover Public Works			Ground Elev			Plan
		the contract of the contract o	Shawn McClane Case Mode	1 580 St	narl	Time Started			825
Veather	Windy, 40s				ft.	Time Started			835
		Capacity	1/3 cu. yd. Reach	10		i inic compi	Cicu		033
		Soil Description			Sample	PID		Boulders:	l -
Depth		Bon Description			No.	Reading	Excav.	Count/	Note
	·					(ppm)	Effort	Class	No.
- 0 - Brown fil	ne to coarse SAND, trace Silt.								
Drown, in	ic to coarse of the state of the						E		1
- 1'									
Gray-broy	vn, Silty CLAY.								
- 2' — Gray bio'	in, birty ozarr.								
Black fin	e to medium SAND with Organics, wo	od (5-10%), 1 tire, t	orick (10-12%).						
- 3' — Black, III		- · · · · · · · ·	•						
		• .			S-1	ND	<b>V</b>		2
- 4'-									
	Bottom of test pit at 4.2 fee	t below ground surf	face. No refusal.						3
- 5'-	·								
							ļ		<b>↓</b>
- 6'-									
_ 7'				:				<u> </u>	ļ
- / -									
8'						ļ			ļ
- ° 7									
_ 9 _							ļ		ļ
101							<u> </u>	ļ	<b>↓</b>
<b>—</b> 10' <b>—</b>									
_ 11' —							<del> </del>	ļ	<del> </del>
					l				
12'_					İ		-	<b> </b>	-
					ĺ				
<u> </u>							╁──	<del>                                     </del>	<del> </del>
14'							<del> </del>		
									1
15'					1	<b> </b>	1	<del> </del>	+
					1				
— 16' —					1		1	1	+
					1			1	
					1			1	
Notes:									
1. Soil samples w	ere screened in the field for volatile or	ganic compounds (	VOCs) using a TEI Mo	odel 580B Orga	nic Vapor	Meter referer	ice to an i	sobutylene	<b>;-</b>
in-air standard.	Results are reported in the "PID Read	ding (ppm)" column	in parts per million.	ND indicates no	VOCs de	etected.		•	
<ol><li>Groundwater v</li></ol>	vas encountered at a depth of 3.6 feet b	elow ground surface	e.						
2 Toot mit tormin	nated due to collapsing walls.								
5. Test pit termin									
5. Test pit termin									
3. Test pit termi					т			GROUNDWA	TED
		Class	Proportions Used	i	F = Fine	bbreviations	1	JROUNDWA K) Encountere	
Test Pit Pl	Boulder							Not Encountere)	
Test Pit Pl	Letter	Size Range	1	0 100/	M = Me	dium			itticu
Test Pit Pl	Boulder		TRACE (TR.)	0 - 10%	C = Coa	arse	E1		
Test Pit Pl	Letter Designation A B	Size Range Classification 6" - 17" 18" - 36"	TRACE (TR.)	0 - 10% 10 - 20%	C = Coa V = Ver	ry	Ela <sub>l</sub> Tim	osed	Depth to
Test Pit Pl	Letter Designation A B C	Size Range Classification 6" - 17" 18" - 36" 36" and Larger	1		C = Coa V = Ver F/M = F	arse	Tim Rea	osed e to ding	Depth to Ground-
Test Pit Pi	Letter Designation A B C Excavation	Size Range Classification 6" - 17" 18" - 36" 36" and Larger	TRACE (TR.)		C = Coa V = Ver F/M = F F/C = F GR = G	arse Ty Fine to medium ine to coarse Gray	Tim Rea	osed e to	Depth to
Test Pit Pi	Letter Designation A B C Excavation	Size Range Classification 6" - 17" 18" - 36" 36" and Larger Effort	TRACE (TR.) LITTLE (LI.) SOME (SO.)	10 - 20% 20 - 35%	C = Coa V = Ver F/M = F F/C = F GR = G BN = B	rise  Y  Tine to medium  ine to coarse  tray  rown	Tim Rea	osed e to ding	Depth to Ground-
Test Pit Pi	Letter Designation A B C Excavation	Size Range Classification 6"-17" 18"-36" 36" and Larger Effort	TRACE (TR.)	10 - 20%	C = Coa V = Ver F/M = F F/C = F	rise  Y  Tine to medium  ine to coarse  tray  rown	Tim Rea	osed e to ding urs)	Depth to Ground- water

SSM Harvys Road Marchesters, New Hampslaire (3010)  GZA Rep. Jay Hoddenson Contractor Dever Public Works Weather Windy, 46s Contractor Operator Shows McCliner Windy, 46s No. Capacity South Make Capacity Sou	GZA GeoE Engineers/	nvironmental, Inc. Scientists			Dover Public				Test Pit No. Page No. File No.	1		1
Secretarian   Part Hookinson   Contractor   Depth   Windly, 4lls   Part Hookinson   Part				<del></del>	Dover, New Ha	mpsnire						
Description   Soil Description   Soil Description   Soil Description   Soil Description   No. (Soil	GZA Rep.	Jay Hodkinso		Operator Make	Dover Public V Shawn McClar Case	Vorks ne Model	580 Sı		Ground Elev. Time Started		See 0	Plan 355
Brown, fine to coarse SAND, trace SIB.  1'	Depth	T	Soi		1/3 cu. yd.	Reach	16			eted		345
1	0	Brown fine to coarse SA	AND trace Silt									
Solitor   Soli	1'									E		1,2
Black, fine to medium SAND and debris, newspapers, leather clippings, wood, bottles, catchbasin grit smell, metal cans.    Black, fine to medium SAND and debris, newspapers, leather clippings, wood, bottles, catchbasin grit smell, metal cans.    Black, fine to medium SAND and debris, newspapers, leather clippings, wood, bottles, catchbasin grit smell, metal cans.    Solitans	2'	Gray-brown, Silty CLA	Y with brick.									· · · · · · · · · · · · · · · · · · ·
Black, fine to medium SAND and debris, newspapers, leather clippings, wood, bottles, catchbasin grit smell, metal cans.  7 - Black, fine to medium SAND and debris, newspapers, leather clippings, wood, bottles, catchbasin grit smell, metal cans.  ND ND ND ND ND ND ND ND ND ND ND ND ND N									ND			
Black, fine to medium SAND and debris, newspapers, leather clippings, wood, bottles, catchbasin grit smell, metal cans.  Bottom of test pit at 7.7 feet below ground surface. No refusal.  ND  NO  10'  11'  12'  13'  14'  15'  16'  NO  Notes:  1. Soil samples were screened in the field for volatilo organic compounds (VOCs) using a TEI Model 580B Organic Vapor Meter reference to an isobutylene-in-in-in-in-in-in-in-in-in-in-in-in-in-				٠.								2
Bottom of test pit at 7.7 feet below ground surface. No refusal.  ND  ND  ND  ND  ND  ND  ND  ND  ND  N	— 6¹ <del>—</del>		AND and debris, newspapers, lea	ather clipping	s, wood, bottles,	catchbasin gi	rit smell,	S-1				
Notes:  1. Soil samples were screened in the field for votatile organic compounds (VOCs) using a TEI Model \$80B Organic Vapor Meter reference to an isobutylene- in-air standard. Results are reported in the "PID Reading (pym)" column in parts per million. ND indicates no VOCs detected.  2. Sheen on water.  3. Groundwater was encountered at a depth of 5.3 feet below ground surface.  Test Pic Pian    Designation   Column   Proportions   Proportions   Column   Proportions   Proportions   Column   Proportions   Proporti	-		Rottom of test nit at 7.7 feet below	y ground surf	ace No refueal	AL 42-4-, , , , , , , , , , , , , , , , , , ,			ND	+		
Notes:  1. Soil samples were screened in the field for volatile organic compounds (VOCs) using a TEI Model 580B Organic Vapor Meter reference to an isobutylene-in-air standard. Results are reported in the "PID Reading (ppm)" column in parts per million. ND indicates no VOCs detected.  2. Sheen on water.  3. Groundwater was encountered at a depth of 5.3 feet below ground surface.  Test Pit Pitan  1		•	pottoni or test pri at / // rect sello	· Broaria barr	acc. 140 Terubur.				TVD			
Notes:  1. Soil samples were screened in the field for volatile organic compounds (VOCs) using a TEI Model 580B Organic Vapor Meter reference to an isobutylene- in- air standard. Results are reported in the "PID Reading (pym)" column in parts per million. ND indicates no VOCs detected.  2. Sheen on water.  3. Groundwater was encountered at a depth of 5.3 feet below ground surface.  Test Pit Pian  Letter Size Range Designation Classificat												
Notes:  1. Soil samples were screened in the field for volatile organic compounds (VOCs) using a TEI Model 580B Organic Vapor Meter reference to an isobutylene-in-air standard. Results are reported in the "PID Reading (ppm)" column in parts per million. ND indicates no VOCs detected.  2. Sheen on water.  3. Groundwater was encountered at a depth of 5.3 feet below ground surface.  Test Pit Pisa    Designation   Designat	— 11' —									-		
Notes:  1. Soil samples were screened in the field for volatile organic compounds (VOCs) using a TEI Model 580B Organic Vapor Meter reference to an isobutylene- in-air standard. Results are reported in the "PID Reading (ppm)" column in parts per million. ND indicates no VOCs detected.  2. Sheen on water.  3. Groundwater was encountered at a depth of 5.3 feet below ground surface.  Test Pit Plan    Designation   Designation   Designation   Designation   Cassification   TRACE (TR.)   0 - 10%   Medium   C - Coarse   C - Co												
Notes:  1. Soil samples were screened in the field for volatile organic compounds (VOCs) using a TEI Model 580B Organic Vapor Meter reference to an isobutylene- in-air standard. Results are reported in the "PID Reading (ppm)" column in parts per million. ND indicates no VOCs detected.  2. Sheen on water.  3. Groundwater was encountered at a depth of 5.3 feet below ground surface.  Test Pit Plan  Letter Size Range  Designation Classification  A C - 1.7"  B 18" - 36"  C 2.5"  NORTH  NORTH  Executation Effort  Executation E												
Notes:  1. Soil samples were screened in the field for volatile organic compounds (VOCs) using a TEI Model 580B Organic Vapor Meter reference to an isobutylene-in-air standard. Results are reported in the "PID Reading (ppm)" column in parts per million. ND indicates no VOCs detected.  2. Sheen on water.  3. Groundwater was encountered at a depth of 5.3 feet below ground surface.  Test Pit Plan  Boulder Class  Used  F = Fine  (X) Encountered (Y) Not Encountered (Y) Not Encountered (Y) Not Encountered (Y) Not Encountered (Y) Not Encountered (Y) Not Encountered (Y) Not Encountered (F/M = Fine to medium F/C = Fine to coarse (F-Cray NORTH  NOR	l											
1. Soil samples were screened in the field for volatile organic compounds (VOCs) using a TEI Model 580B Organic Vapor Meter reference to an isobutylene-in-air standard. Results are reported in the "PID Reading (ppm)" column in parts per million. ND indicates no VOCs detected.  2. Sheen on water.  3. Groundwater was encountered at a depth of 5.3 feet below ground surface.  Test Pit Plan  Boulder Class  Letter Size Range Designation Classification A 6":17" A 6":17" B 18"-36" C 36" and Larger C C Coarse B 18"-36" C C 36" and Larger Exercise Elapsed Depth Time to to Reading Ground- (Hours) water  Volume = 7.8 cu. yd.  M	— 16' —											
in-air standard. Results are reported in the "PID Reading (ppm)" column in parts per million. ND indicates no VOCs detected.  2. Sheen on water.  3. Groundwater was encountered at a depth of 5.3 feet below ground surface.  Test Pit Plan  Boulder Class Letter Size Range Designation Classification A 6'-17" A 6'-17" B 18"-36" C 36" and Larger C 36" and Larger  NORTH NORTH NORTH Proportions Used TRACE (TR.) 10 - 10% C = Coarse V = Very F/M = Fine to coarse V = Very F/M = Fine to coarse F/C = Fine to coarse F/C = Fine to coarse GROUNDWATER (X) Encountered (Not Encountered C) Not Encountered C = Coarse V = Very F/M = Fine to medium F/C = Fine to coarse GROUNDWATER (X) Encountered C = Coarse V = Very F/M = Fine to medium F/M = Fine to medium F/M = Fine to coarse GROUNDWATER (X) Encountered (Not Encountered C = Coarse V = Very F/M = Fine to medium F/M = Fine to coarse GROUNDWATER (X) Encountered (Not Encountered C = Coarse V = Very F/M = Fine to medium F/M = Fine to coarse GROUNDWATER (X) Encountered (Not Encountered C = Coarse V = Very F/M = Fine to medium F/M = Fine to coarse GROUNDWATER (X) Encountered (Not Encountered C = Coarse V = Very F/M = Fine to medium F/M = Fine to coarse GROUNDWATER (X) Encountered (Not Encountered C = Coarse V = Very F/M = Fine to medium F/M = Fine		·										
11   Letter   Size Range   Used   F = Fine   (X) Encountered	in-air st	andard. Results are reporte on water.	ed in the "PID Reading (ppm)" colum	nn in parts per n				erence to an	isobutylene-			
Designation   Classification   A 6" - 17"   B 18" - 36"   C 36" and Larger   Excavation Effort   EEasy   MModerate   DDifficult   DDifficult   AND   35 - 50%   YEL = Yellow   Yellow   () Not Encountered   C = Coarse   C C Coarse   V = Very   F/M = Fine to medium   F/C = Fine to coarse   C = Coarse				ge					viations	ı		
NORTH Exeasy Some (SO.) 20 - 35% GR = Gray (Hours) water  Volume = 7.8 cu. yd. MModerate DDifficult AND 35 - 50% YEL = Yellow (Hours) water  0.10 5.3'	2.5		Designation Classificat A 6" - 17' B 18" - 36 C 36" and Lar	ion " 5"	TRACE (TR.)	0 - 10	1	M = Medium C = Coarse V = Very F/M = Fine t	o medium	( ) N Elapsed Time to	Not Encountered  E  to	•
GZA GeoEnvironmental, Inc. 1/22457/tp/tp1-5.xls	/olume =		EEasy MModerate				1	GR = Gray BN = Brown		(Hours	) w	ater
	G	GZA GeoEnvironme	ental, Inc.		1/22457/tp/tp1-5.xls							

	environmental, Inc.	·		Dover Public V	Vorke.			Test Pit No. Page No.	1	TP2 of	-6 1
ngineers/S	Scientists			Dover, New Han				File No.		22457	7.00
00 ITa	, Doad		L	JUVEL, INEW FIAN	фанис			Checked By:		<u>2243</u>	
30 Harvey	r, New Hampshire 03103	AAAA AAAA AAAA AAAA AAAA AAAA AAAA AAAA AAAA				and the second of the second second					
iancheste	i, New Hampsinie U51U3			Excavation	ı Equipm	nent					
ZA Rep.	Jay Hodkinson		Contractor	Dover Public V				Date		04/	11/2000
Zir reop.	out Trouming		Operator	Shawn McClar				Ground Elev	•	Se	e Plan
/eather	Windy, 40s		Make	Case	Model	580 Sı	iperL	Time Started	Ī		0850
, 000.102			Capacity	1/3 cu. yd.	Reach	16	ft.	Time Compl	eted		0905
Depth		Soi	l Description				Sample No.	PID Reading	Excav.	Boulders Count/	Note
_ 0		.*						(ppm)	Effort	Class	No.
	Dark brown, fine to coarse	e SAND, some Silt. (TOPSO	IL)						E		1
- 1'								<u> </u>			1
•										İ	
- 2'										<u> </u>	-
		_									1
- 3'	Brown, Clayey SILT, trace	e Organics									
	Diown, Claycy Sill I, Hace	B									
- 4'											
- 5'											
. ZI										<u> </u>	2, 3
<b>-</b> 6' <b></b>											
_ 7'		6		noo Nofis-1				<b></b>	<b>├</b> ▼	<del> </del>	<del>                                     </del>
	Bot	ttom of test pit at 7 feet belo	w ground suri	ace. No ferusar							
8'									<del>                                     </del>	<del> </del>	-
											ŀ
_ 9'_	4								<b>†</b>	<del> </del>	
											1
— 10' —											
										<u> </u>	
— 11' <i>—</i>											
— 12' —									ļ		
12											1
13'									<del> </del>	<del> </del>	
14'	<u> </u>							<del>                                     </del>		<del>                                     </del>	
							1				
15'	-								<b>T</b>	1	1
								L			
<b>—</b> 16' <b>—</b>	1							200			- [
lotes:	<u> </u>										<del></del>
	complet were correct in	the field for volatile organic	: compounds !	VOCs) using a	TEI Mod	iel 580B Orga	nic Vapor	Meter referen	ice to an i	sobutylen	e-
1. Soil	ir standard Results are rer	ported in the "PID Reading (	[ppm]" colum	n in parts per m	illion. N	D indicates n	o VOCs d	etected.			
2. Gro	undwater was encountered	at a depth of 6 feet below g	round surface								
	natural soil.										
							<del></del>			CD OIL TO	A TECH
	Test Pit Plan	Boulder Class	_	P	oportions		F = Fine	Abbreviations		GROUNDW. X) Encounter	
_, r	9'		Range sification	TD A CE /ED		0 - 10%	M = Me			) Not Encounter	
2'		A 6	" - 17"	TRACE (TR.)	'	0 - 1070	C = Co		Elar	osed	Depth
	$\Lambda$		t" - 36" nd Larger	LITTLE (LI.)		10 - 20%	V = Ve F/M = I	ry Fine to medium	Tim	e to	to
	/1	Excavation Effort				20 2551	F/C = F	ine to coarse	- 1	ding urs)	Ground- water
	NORTH	EEasy		SOME (SO.)		20 - 35%	GR = C BN = B		(,,,,		
Volume =	4.7 cu. yd.	MModerate DDifficult		AND		35 - 50%	YEL=		<u> </u>	0.10	6'
		DDifficult									
	4										
	GZA GeoEnvironr	mental, Inc.		I/22457/tp/tp6-9	xls						

	Environmental, Inc.				.0			Test Pit No.		TP2-	7
Engineers/	Scientists			Dover Public Dover, New Ha				Page No.	1		1
380 Harvey	y Road			Dover, New Ha	mpsiure			File No. Checked By:		22457. NJN	
	r, New Hampshire 0310	3						··· <b>J</b> ·			
CZA D	T TT- 41.4		<i>c</i>		n Equipmen	it					
GZA Rep.	Jay Hodkinso	on	Contractor Operator	Dover Public V Shawn McClar				Date Ground Elev			1/2000
Weather	Windy, 40s		Make	Case	Model	580 St	ıperL	Time Started	•		Plan 920
			Capacity	1/3 cu. yd.	Reach	16	ft.	Time Comple	eted		930
Depth		501	l Description				Sample No.	PID Reading	Excav.	Boulders:	
0							140.	(ppm)	Effort	Count/ Class	Note No.
	Gray-brown, fine to coa	rse SAND, some Clay with bricks	s (5-10%) and	wood (5-10%).							
1' <del></del>									Е		1
_								ND			
2'								ND			
<del></del> 3'											
J	Light brown, fine SANI	), little Silt.									
<del></del> 4'	Brown, Clayey SILT, litt	le Organics								<b> </b>	
	Diowit, Chayey oibi, itt	ic Organics.	٠.								
- 5'-											
— 6'—		Pattern of test wit at 6 feet below		NT ( 1							
		Bottom of test pit at 6 feet below	ground surra	ice. No rerusai.							ŀ
— <i>7</i> '—											
<u> </u>											
<b></b> 9'						İ					
401											
10'											
— 11'—											
											i
12'											
13'						ļ					
j											
— 14' —											
15'						.					
10											
— 16' —						1					
-									- 1	1	I
Notes:									<u></u>		·
		field for volatile organic compounds					erence to an	isobutylene-			ı
in-air st	andard. Results are reporte	ed in the "PID Reading (ppm)" colum	n in parts per n	nillion. ND indica	ates no VOCs	detected.					
											ı
	T Die Di-										
	Test Pit Plan 3.5	Boulder Class Letter Size Rang			ortions sed	i	Abbre F = Fine	viations	1	OUNDWATER	
11		Designation Classificati	on	TRACE (TR.)	0 - 1	0%	M = Medium	1		incountered Not Encountered	
L		A 6" - 17" B 18" - 36'				ĺ	C = Coarse V = Very		Elapsed		Depth
	1	C 36" and Larg		LITTLE (LI.)	10 - 2	20%	F/M = Fine t		Time to Reading		o Fround-
	NORTH	Excavation Effort EEasy	l	SOME (SO.)	20 - 3	35%	F/C = Fine to GR = Gray	coarse	(Hours)		vater
/olume =	8.5 cu. yd.	MModerate DDifficult	ĺ	AND	35 - 5	50%	BN = Brown YEL = Yellov	٧			
		D				L					
G	GZA GeoEnvironme	ental. Inc.	<u>-</u>	IMPACE L. C. C.							I
				I/22457/tp/tp6-9.xls							1

ZA GeoEnvironmenta	, Inc.					Test Pit No.		TP2-	8a
Ingineers/Scientists			Dover Public Works			Page No. File No.	1	of 22457	1
	_	· • · · · · · · · · · · · · · · · · · ·	Dover, New Hampshire			Checked By:		22437 NJI	
80 Harvey Road Ianchester, New Hamp	hire 03103	1044 A 1 104 100 A 10 A 10 A 10 A 10 A 1				Checked by.		1401	
danchester, New Hamp	anic dolloo		Excavation Equip	ment					
GZA Rep. Jay	Hodkinson	Contractor	Dover Public Works		ment of the state	Date	Charles and an included the	04/	11/2000
·		Operator	Shawn McClane			Ground Elev			e Plan
Veather Wi	ndy, 40s	Make	Case Mode			Time Started			0930
		Capacity	1/3 cu. yd. Reach	16	ft.	Time Compl	eted	(	0945
· ·									
Depth		Soil Description			Sample No.	PID Reading	Excav.	Boulders Count/	Note
					IVU.	(ppm)	Effort	Class	No.
Dork brown	fine to coarse SAND, little Sil	t some Root (TOPSOII	.)			(PP)	Billion	Citabb	1.0.
Dark brown,	fille to coarse BAND, fittle of	i, some reser (101 5012	•,	į			Е		1
- 1'							_		1
			197						tr.
- 2'-									
- 3'-									ļ
Light brown	fine SAND, some Silt.								
- 4'			•				-		<del> </del>
-	Double	1.5 feet below ground sur	face No refuse!				'		
- 5'-	Bottom of test pit at 4	cor delow ground sui	1400. INO ICIUSAL.			<b> </b>		<b> </b>	<del> </del>
- 6'-				1					
- 7' <del>-  </del>				Ī					
8'				İ					ļ.
- 8 -									1
9'							ļ	<u> </u>	<b></b>
_ / _									
— 10' —							<del> </del>	<del> </del>	<del></del>
				1			1		
— 11'—								<b></b>	
— 12'—		•		ı					1
— 13'—				l			ŀ		
14'							<b> </b>		
				İ				l	
15'				44			┼	ļ	
				i					- 1
— 16'—							<del>                                     </del>	<del> </del>	
						A-14			
lotes:				1			<u> </u>	<u> </u>	
			NOCa) using a TELMa	dal 590D Organ	ic Vanos	r Meter referen	ce to an is	obutulene	
<ol> <li>Soil samples wer</li> </ol>	e screened in the field for volat tesults are reported in the "PID	me organic compounds (	n in parts per million	ID indicates no	VOCs d	etected.	cc to air i	oouty icin	_
in-air standard. I	esuns are reported in the Tib	reading (ppin) colum	ir iii parto por iiiiiioii.						
		· ·							
Test Pit Plan	В	oulder Class	Proportions			Abbreviations	l	ROUNDWA	
3	Letter	Size Range Classification	Used		F = Fine M = Me			) Encountere ) Not Encou	
8	Designation A	6" - 17"	TRACE (TR.)	0 - 10%	C = Coa	arse			Depth
<u> </u>	В	18" - 36"	LITTLE (LI.)	10 - 20%	V = Ve	ry Fine to medium	Elap: Time		to
$\rightarrow$	С	36" and Larger			F/C = F	ine to coarse	Read	ling	Ground-
NORTH		avation Effort Easy	SOME (SO.)	20 - 35%	GR = G		(Hou	ırs)	water
Volume = 4	cu vd M	Moderate	AND	35 - 50%	BN = B YEL =				
		D:051	IAND	JJ - JU /U	ı				
volume = 4	- D	Difficult							

GZA GeoE Engineers/	nvironmental, Inc. Scientists			Dover Public	Works			Test Pit No. Page No.	1	TP2-	8
				Dover, New Ha	mpshire			File No.		22457.	.00
380 Harvey								Checked By:		NJN	
Manchester	, New Hampshire 0310	3									
C7 A D	T TT- J1-:	_	Contonaton		n Equipment	ŧ		<b>.</b>			1
GZA Rep.	Jay Hodkinso	on .	Contractor	Dover Public V				Date			1/2000
Weather	Windy, 40s		Operator Make	Shawn McClar Case	Model	E00 C-		Ground Elev	•		Plan
vveautei	VIIIdy, 405		Capacity	1/3 cu. yd.	Reach	580 St 16		Time Started Time Comple	لدما		947
			Capacity	1/3 cu. yu.	Neach		11.	Thrie Compie	rteu		953
Depth		Soil	Description				Sample	PID		Boulders:	
			<b>-</b>				No.	Reading	Excav.	Count/	Note
0								(ppm)	Effort	Class	No.
0	Leather clippings (5%),	brick (10%), gray-brown Silty SA	ND.								
a								ND	Е		1
— 1'—											
— 2'—									₩		2
			-								
_ 3'_	Botto	om of test pit at 2.3 feet below gro	ound surface.	Refusal on boul	der.				D		İ
<u> </u>						1					
_											
— 5'—			•								
											. 1
<b>−</b> 6' <b>−</b>											
						l		1			
— 7'—											
~ l						ĺ					1
— 8'—						l					
9'						ļ					
_ , _						l					
— <sub>10'</sub> —						ļ					
10						ŀ					
— 11' —											
										İ	1
12'											
									I	Ì	1
— 13' —											
						1		l l			ı
— 14'—						Ī					
15'						. ]			l	1	•
13						İ					
— <sub>16'</sub> —											1
10						- 1					
											-
Notes:											
1. Soil san	ples were screened in the f	ield for volatile organic compounds	(VOCs) using a	TEI Model 580E	3 Organic Vapo	or Meter refe	erence to an	isobutylene-			1
in-air st	andard. Results are reporte	d in the "PID Reading (ppm)" colum	n in parts per n	nillion. ND indica	ates no VOCs o	detected.					ŀ
2. Refusal	on boulder, moved 10 feet.										
											l
											ł
	Test Pit Plan					r				<del></del>	
	lest Pit Plan 8	Boulder Class	_		ortions			viations		UNDWATER	
4		Letter Size Rang Designation Classificati			sed	200	F = Fine M = Medium	1		ncountered lot Encountered	
, r		A 6" - 17"	·	TRACE (TR.)	0 - 10	J70	C = Coarse	•	1		1
	_	B 18" - 36' C 36" and Lary		LITTLE (LI.)	10 - 20	.0%	V = Very		Elapsed Time to		Depth o
	$\longrightarrow$	C 36" and Larg Excavation Effort	501				F/M = Fine t F/C = Fine to		Reading	; G	Ground-
	NORTH	EEasy		SOME (SO.)	20 - 3	5%	GR = Gray		(Hours)	W	vater
/olume =	3 cu. yd.	MModerate		AND	35 - 50	0%	BN = Brown YEL = Yellov	v			
-		DDifficult		עווער	33 - 30	V/0	1PP - 16HOA	•			
	GZA GeoEnvironme	ntal, Inc.	1	/22457/tn/tn6-9 xls							

GZA GeoEnvironmental, Inc.					Test Pit No.		TP2-9	
ngineers/Scientists		Dover Public Works			Page No. File No.	1	of	1
Name of the last o	<u>.</u> D	Oover, New Hampshire			Checked By:		22457.0 NJN	
80 Harvey Road					CHUCKEU DY		INJIN	
Manchester, New Hampshire 03103		Excavation Equip	ment					
GZA Rep. Jay Hodkinson	Contractor	Dover Public Works			Date		04/1	1/2000
ZZA RCp. Jay Houkinson	Operator	Shawn McClane			Ground Elev	·	See	Plan
Veather Windy, 40s	Make	Case Mode	1 580 St	perL	Time Started	1	10	000
	Capacity	1/3 cu. yd. Reach	n 16	ft.	Time Compl	eted	10	020
						,		
Depth	Soil Description			Sample	PID	r	Boulders:	
				No.	Reading (ppm)	Excav. Effort	Count/ Class	Note No.
0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 -	C:1+				(рриг)	Littit	Class	. 140.
Brown, fine to coarse SAND, some Gravel, trace	SIII.					E		1
- 1'						1		
		.09						in in
<b>-</b> 2' <del></del>								
21								
Gray-brown, fine to coarse SAND, little Silt, brid	ck (5%), wood (10%	%), shingles (5%), rags	(5%).					ĺ
4'—		•			<u> </u>		<b> </b>	
- 4 -				6.1		₩		
_ 5'				S-1		<b>  ▼</b>	<b> </b>	
			·		ND	М		
<b>-</b> 6' <b></b>					1110	141	<del>                                     </del>	
						М		ĺ
_ 7'								
			i			D		
— 8'—								
— 9'—								
— 10' —				ļ		<del>  •</del>	<b></b>	2
		C 31 C 1			_			İ
Bottom of test pit at 10.5 fe	et below ground su	rrace. No refusal.				<del></del>	-	
						1		
— 12' —					<del></del>	1	+	<del>                                     </del>
·								
— 13'—							1	
14'								
15'				1		<b>_</b>		
- 13 <b>-</b>					1			
— 16' —								<del> </del>
				1	1			1
Notes:								
1. Soil samples were screened in the field for volatile or	ganic compounds (	VOCs) using a TEI M	odel 580B Orga	nic Vapor	Meter referen	nce to an i	sobutylene-	
in-air standard. Results are reported in the "PID Read	ding (ppm)" columi	n in parts per million.	ND indicates no	vous de	elected.			
2. Test pit terminated due to collapsing walls.								
				A	bbreviations		GROUNDWAT	ER
Test Pit Plan Boulder	Clace	Proportion	i			1 ,	\ T	
Test Pit Plan Boulder 14 Letter	Size Range	Proportion: Used	<b>.</b>	F = Fine			) Encountered	
14 Letter Designation	Size Range Classification		0 - 10%	F = Fine M = Me C = Coa	dium	O	X ) Not Encoun	tered
14 Letter	Size Range	Used TRACE (TR.)	0 - 10%	M = Me C = Coa V = Ver	dium urse y	Elap	X) Not Encoun	tered Depth
14 Letter  14 Designation A	Size Range Classification 6" - 17"	Used		M = Me C = Coa V = Ver F/M = F	dium irse y 'ine to medium	Elap Tim	X) Not Encoun	Depth to Ground-
14 Letter Designation A B C Excavation	Size Range Classification 6" - 17" 18" - 36" 36" and Larger	Used TRACE (TR.)	0 - 10%	M = Me C = Coa V = Ver F/M = F F/C = F	dium rse y ine to medium ine to coarse ray	Elap Tim Rea	X ) Not Encoun osed se to	Depth to
14 Letter Designation A B C  Excavation NORTH EEasy	Size Range Classification 6" - 17" 18" - 36" 36" and Larger Effort	Used TRACE (TR.)  LITTLE (LI.)  SOME (SO.)	0 - 10% 10 - 20% 20 - 35%	M = Me C = Coa V = Ver F/M = F F/C = F GR = G BN = B	dium urse y ine to medium une to coarse ray rown	Elap Tim Rea	X) Not Encoun osed ne to ding	Depth to Ground-
14 Letter  Designation  A  B  C  Excavation  NORTH  EEasy	Size Range Classification 6" - 17" 18" - 36" 36" and Larger Effort	Used TRACE (TR.) LITTLE (LI.)	0 - 10% 10 - 20%	M = Me C = Coa V = Ver F/M = F F/C = F	dium urse y ine to medium une to coarse ray rown	Elap Tim Rea	X) Not Encoun osed ne to ding	Depth to Ground-

Engineer /Caia						Test Pit No.		TP2-1	0
Engineers/Scienti	sts		Dover Public We			Page No.	1		1
380 Harvey Road	<u></u>		Dover, New Hamp	shire		File No. Checked By		22457.0	
	Hampshire 03103					Checked by		NJN	
,			Excavation	Equipment					
GZA Rep.	Jay Hodkinson	Contractor		• •		Date		04/11	1/2000
		Operator	Shawn McClane			Ground Elev	·.	See	Plan
Weather	Windy, 40s	Make			SuperL	Time Started	I	10	030
		Capacity	1/3 cu. yd.	Reach 16	ft.	Time Compl	eted	10	045
Depth		Soil Description			I C1-	I DID		D 11 I	
Берш		Son Description	1		Sample No.	PID Reading	Excav.	Boulders: Count/	Note
					110.	(ppm)	Effort	Class	No.
Brown	, fine to coarse SAND, some Gravel	, trace Silt.		<u> </u>		1 11 /			1.0.
11							E		1
_ 1 _					İ				
_ 2'_			-4		l				i.
	Fabric Liner _								
— 3'———————————————————————————————————	dock fine to seems CAND some Cit	t loothar alimnings (100	/)(10/)			ND			
	plack, fine to coarse SAND, some Sil aper (5%), bottles (1%).	u, reauter crippings (10%	o, metal wire (1%)	, woou (3%),					2
— 4'—	apor (570), botties (170).		•					<del></del>	2
				· · · · · · · · · · · · · · · · · · ·	<u></u>	.	▼		3
— 5'—	Bottom of test pit at 4	.7 feet below ground su	rface. No refusal.	İ					
6'									
_ 0_]									
7'		•							
Ī					]	1			
8' <del></del>									
i									
<b>-</b> 9'-					1				
<u> </u>									
_ 11'-									
***									
12'									
<b>—</b> 13' <b>—</b>									
— 14'—									
15'								İ	
<b>—</b> 13 <b>—</b>									
16'									
10									
1						L			
in-air standar  2. Groundwater	were screened in the field for volatil d. Results are reported in the "PID I was encountered at a depth of 3.9 for inated due to collapsing walls.	Reading (ppm)" column	in parts per million				to an isc	butylene-	
Test Pit 1	Plan	ld Class	n				GP	OUNDWATER	
2.5	Letter	lder Class Size Range	Proporti Used		Abbi F = Fine	reviations		Encountered	
10	Designation A	Classification 6" - 17"	TRACE (TR.)	0 - 10%	M = Mediu C = Coarse	m	( )	Not Encountered	d
1	В	18" - 36"	I Imm n a	10 000:	V = Coarse		Elapse		Depth
//	С	36" and Larger	LITTLE (LI.)	10 - 20%	F/M = Fine		Time to Readin		o Ground-
MOTO		ation Effort	SOME (SO.)	20 - 35%	F/C = Fine GR = Gray	io coarse	(Hours		vater
NORT		asy Moderate			BN = Brow				2.01
olume = 44	CH. YU.		I ANTO	25 500/	YEL = Yell	ow	0.1	ιυ [	3.9'
olume = 4.4	DE	Difficult	AND	35 - 50%					

ZA GeoEnvironmental, Inc.							Test Pit No.		TP2-	
ngineers/Scientists			Dover Public \				Page No.	1	of	1
		Ι	Dover, New Hai	mpshire			File No.		22457	
80 Harvey Road							Checked By:		ИЛ	¥
anchester, New Hampshire 03103						·····	· · · · · · · · · · · · · · · · · · ·			<del></del>
				n Equipmen	t		Date		04/	1/2000
ZA Rep. Jay Hodkinson		Contractor	Dover Public				Ground Elev			e Plan
And the second of the second o		Operator	Shawn McCla		580 Su	norI	Time Started			100
Windy, 40s		Make	Case	Model	16		Time Compl			1115
		Capacity	1/3 cu. yd.	Reach	10	ft.	Time Compi	cicu		1113
	S.c.	oil Description			I	Sample	PID	Γ	Boulders	1
Depth		il Description				No.	Reading	Excav.	Count/	Note
					[		(ppm)	Effort	Class	No.
Brown, fine to coarse SAN	ID trace Silt						- · · · · ·			
Brown, Thie to coarse SAIV	D, trace ont.							Е		1
Orange-brown, fine SAND	Little Silt									
Offinge-brown, fine brave	, intilo bitt.			*				1		
2'										<b>†</b>
Brown, fine to coarse SAN	ID trace Silt									
3'—Brown, time to course britis	D, Hadd Sin.									
			•				ND			
- 4'—										1
- 5'										1
1									<u></u>	<u>L</u>
- 6'-										2
										1
Blackish brown, fine to co	arse SAND, trace Silt, woo	od, leather clip	pings (5-15%).	(River Dred	gings)					
:									<u> </u>	<u> </u>
<b>–</b> 8' <b>–</b> 1 – 1 – 1										
<b>-</b> 9' <b>-</b>							ND	•		
Botto	om of test pit at 9.5 feet be	low ground sur	rface. No refusa	al.						3
- 10' <del>-  </del>								İ		1
.,,					,			ļ		
- 11'-								ľ		
_ 12' _								<b> </b>		
_ 12 _										
<b>—</b> 13' <b>—</b>							ļ			<u> </u>
_ 13 _										
14'										<b>-</b>
										İ
15'								-	-	
						•				
_ 16' _										
						1				
						L				<u> </u>
otes:										
. Soil samples were screened in t	he field for volatile organi	c compounds (	VOCs) using a	TEI Model	580B Orga	nic Vapor	Meter referer	ice to an	isobutylene	÷-
in-air standard. Results are repe	orted in the "PID Reading	(ppm)" columi	n in parts per m	illion. ND i	indicates no	VOCs de	etected.			
<ol> <li>Groundwater was encountered a</li> </ol>		w ground surfa	ice.							
	psing walls.									
<ol> <li>Test pit terminated due to colla</li> </ol>										
3. Test pit terminated due to colla										
3. Test pit terminated due to colla								<del></del>	on one and	
						A	bbreviations	1	GROUNDWA	
Test Pit Plan	Boulder Class	·.	P	roportions		- ·				
	Letter Siz	e Range		Used		F = Fine			) Encountere X ) Not Encou	
Test Pit Plan	Letter Siz Designation Clas	sification	TRACE (TR.	Used	- 10%	F = Fine M = Me C = Coa	dium	(:	X ) Not Encou	ntered
Test Pit Plan 3	Letter Siz Designation Clas A		TRACE (TR.	Used ) 0		M = Me C = Coa V = Ver	dium rse y	Ela	X ) Not Encou psed	ntered Depth
Test Pit Plan 3	Letter Siz Designation Clas A 6 B 1	ssification 5" - 17"		Used ) 0	- 10% 0 - 20%	M = Me C = Coa V = Ver F/M = F	dium rse y ine to medium	Ela <sub>l</sub> Tin	X ) Not Encou psed	ntered
Test Pit Plan 3	Letter Siz Designation Clas A 6 B 1 C 36° a  Excavation Effort	ssification 5" - 17" 8" - 36" ind Larger	TRACE (TR.	Used ) 0		M = Me C = Coa V = Ver F/M = F	dium rse y ine to medium ine to coarse	Ela <sub>l</sub> Tim Rea	X) Not Encou psed ne to	ntered Depth to
Test Pit Plan 3 10 NORTH	Letter Siz Designation Clas A 6 B 1 C 36° a  Excavation Effort EEasy	ssification 5" - 17" 8" - 36" ind Larger	TRACE (TR.	Used ) 0 ) 10	0 - 20% 0 - 35%	M = Me C = Coa V = Ver F/M = F F/C = F GR = G BN = B	dium rse y ine to medium ine to coarse ray rown	Ela <sub>l</sub> Tim Rea	X ) Not Encou psed ne to ding ours)	Depth to Ground- water
Test Pit Plan 3	Letter Siz Designation Clas A 6 B 1 C 36° a  Excavation Effort	ssification 5" - 17" 8" - 36" ind Larger	TRACE (TR.	Used ) 0 ) 10	0 - 20%	M = Me C = Coa V = Ver F/M = F F/C = F	dium rse y ine to medium ine to coarse ray rown	Ela <sub>l</sub> Tim Rea	X) Not Encou psed ne to ading	ntered  Depth  to  Ground-

GZA GeoEnvironmental, Inc.	TANK WE SEE THE SECOND						Test Pit No.		TP2-	12
Engineers/Scientists			Dover Public				Page No.	1	of	1
			Dover, New Ha	mpshire			File No.		22457	
380 Harvey Road	102						Checked By	:	NJN	1
Manchester, New Hampshire 03	103		Evenyatio	n Equipment						
GZA Rep. Jay Hodkins	son	Contractor					Date		04/1	1/2000
SZI Rep. Say Houking	5011	Operator	Shawn McCla				Ground Elev			172000 e Plan
Weather Windy, 40s		Make	Case	Model	580 Si	unerl.	Time Started			130
		Capacity	1/3 cu. yd.	Reach	16		Time Compl			150
		• •			•					100
Depth	Soil	Description	1			Sample	PID		Boulders:	
						No.	Reading	Excav.	Count/	Note
00	·						(ppm)	Effort	Class	No.
Dark brown, fine to co	oarse SAND, some Silt. (TOPSO	IL)								
1'								Е		1
			_					1		
2'										
Orange-brown, fine SA	AND, some Silt. (Loess)									
3'										
— 4' —		•					<del></del>			
l l					1					
Gray-brown fine to m	edium SAND, some Silt, Organic	rs (Peat)								
	,,,,,	()								2
— 6'—										
7' <b></b> _										
<b>-</b> ' <b>-</b>					I					
8'					[					
9' B	Bottom of test pit at 8.3 feet below	v ground sur	rface. No refusal		l					
10'					l					
					1					
11'										
					l					
— 12' —					- 1					
					- 1					
— 13'—										
14'										
15'					1					
— 15'—										
— 16' —					I					
10					i.					
Notes:										
1. Soil samples were screened i	n the field for volatile organic co	mpounds (V	OCs) using a T	EI Model 580	B Organi	c Vapor M	leter reference	to an isc	obutylene-	
	reported in the "PID Reading (ppr								, a mij 10110	
	ed at a depth of 6 feet below grou									
Test Pit Plan	Boulder Class			ortions		Abbr	eviations	GR	OUNDWATE	R
4	Letter Size Ran	-	l u	sed	1	F = Fine	_		Encountered	
10	Designation Classifica A 6" - 17		TRACE (TR.)	0 - 10	%	M = Mediur C = Coarse	11	1 ( )	Not Encounter	
	B 18" - 30	6"	LITTLE (LI.)	10 - 20	<sub>0%</sub>	V = Very		Elapsed Time to		Depth to
	C 36" and La	rger		10 - 20		F/M = Fine F/C = Fine t		Readin		Ground-
NORTH	Excavation Effort EEasy		SOME (SO.)	20 - 35	5%	GR = Gray		(Hours	) '	water
Volume = 12.3 cu. yd.	MModerate		AND	25 50	,,,	BN = Brown YEL = Yello		0.1	10	~6
	DDifficult		AND	35 - 50	)%	ILL - I elle			-	-
									I	
GZA GeoEnviron	mental, Inc.		I/22457/tp/tp6-9.xls							

IZA OCULI	nvironmental, Inc.			В		Test Pit No.		TP2-	
ngineers/S	cientists		Dover Public Work			Page No. File No.	1	of 22457	1
	-	D	over, New Hampsh	ire		Checked By:		22437 NJI	
30 Harvey			AND A STATE OF THE COMMANDER AND ADDRESS OF T			Checked by			
lanchester,	, New Hampshire 03103		Excavation Ec	minment					
ZA Rep.	Jay Hodkinson	Contractor	Dover Public Worl			Date		04/	11/2000
ZA Kep.	Jay Houkinson		Shawn McClane			Ground Elev		Se	ee Plan
/eather	Windy, 40s			odel 580	SuperL	Time Started			1200
		Capacity	1/3 cu. yd. Re	each	16 ft.	Time Compl	eted		1220
						T		<del>15 11</del>	<del></del>
Depth	s	oil Description			Sample No.	PID Reading	Excav.	Boulders Count/	Note
					10.	(ppm)	Effort	Class	No.
_ 0	CAND link City roots				_	(ррііі)	Brien	Class	110.
1	Dark brown, fine to coarse SAND, little Silt, roots.						E	1	1
- 1'									
			*						le:
- 2'—	Black, fine to coarse SAND, trace Silt, leather clippi	ngs, bricks, etc.							
1	•				_	ND		<u> </u>	
- 3'-									1
_ ^'	Gray-brown, fine to coarse SAND, trace Silt.	•				· · · · · · · · · · · · · · · · · · ·	<del>                                     </del>	<del> </del>	
]						ND			
_ 5'-						140	+	<del> </del>	2
									-
_ 6'—								<del> </del>	1
1						1			
- " <del>-</del> -	Bottom of test pit at 6.8 t	eet below groun	d surface.						
	• •								
— 8'—									
_ 9'_							<del> </del>	<del> </del>	4
_ ,_									
- 10'							<del> </del>	+	
10									
_ 11'-							1	+	
.								l	
— 12' —							1		
— 13'—									1
					Į.				
14'	·				1	Ì	İ		1
15'							+		
1.5								1	
16'							<del> </del>		
• •			é		:		- [		ŀ
	<u> </u>								
Notes:								: h	
1. Soil	samples were screened in the field for volatile organ	ic compounds (	VOCs) using a 1E.	Model 580B C	organic vapoi es no VOCs de	etected	nce to an	isobutylen	10-
in-ai	ir standard. Results are reported in the "PID Reading andwater encountered at a depth of 5.5 feet below gro	g (ppm) colum and surface	i in parts per milite	ni. 14D maicate	23 110 1003 0	otobiod.			
2. Grou	ndwater encountered at a depth of 3.3 feet below give	dia barrace.							
	Test Pit Plan Boulder Class	5	Propor			Abbreviations	1	GROUNDW	
	10 Letter S	ize Range	Us		F = Fine M = Me			X ) Encounte ) Not Enco	
. г	Designation Cl A	assification 6" - 17"	TRACE (TR.)	0 - 10%	C = Coa	arse	1	apsed	Depth
4	В	18" - 36"	LITTLE (LI.)	10 - 20%	V = Ve F/M = 1	ry Fine to medium	Tir	me to	to
⁴ L		and Larger	1			ine to coarse		ading	Ground-
<sup>4</sup> L			i						water
<sup>4</sup> L	Excavation Effe	ort	SOME (SO.)	20 - 35%		•	(H	ours)	water
4 Volume =	Excavation Effo		SOME (SO.)	20 <b>-</b> 35% 35 <b>-</b> 50%	BN = B	lrown	(1)	0.05	water 5.5'

	nvironmental, Inc.							Test Pit No.		TP2-	14	
Engineers/	/Scientists Dover Public Works  Dover, New Hampshire							Page No.	1	1		
				File No.		22457.00						
380 Harvey		-						Checked By:		NJI	1	
Manchester	r, New Hampshire 0310	3		Ftia	n Equipmen							
GZA Rep.	Jay Hodkinso	an.	Contractor	Dover Public V		τ		Date		04.7	11 /0000	
GZA Rep.	Jay Houkinso	11			Ground Elev			11/2000				
Weather	Windy, 40s		Operator Make	Shawn McClar Case	Model	580 S	uperL	Time Started		See Plan 1240		
			Capacity	1/3 cu. yd.	Reach	16		Time Comple			1250	
_							· · · · · · · · · · · · · · · · · · ·					
Depth		Soil	Description				Sample	PID		Boulders:		
							No.	Reading	Excav.	Count/	Note	
0	Di11- 1	CANTO toras Cita Assalsala	l:-11	•	····			(ppm)	Effort	Class	No.	
	biackish brown, line to t	coarse SAND, trace Silt, Asphalt,	oricks, clay p	ipe scraps.				]			1 .	
- 1'							Ì		E		1	
		(CONSTRUCTIO	ON DEBRIS				S-1	ND				
— 2'——		(00000000000000000000000000000000000000	· · · · · · · · · · · · · · · · · · ·	.ee							<del>                                     </del>	
3'							1			in		
_ ,	Brown, fine to coarse SA	ND, some Silt. some Organics.										
_ 4' _								·				
-												
— 5'—				•							<u> </u>	
											1 1	
— 6'—											<del>                                     </del>	
— 7'—											2 .	
8'											~	
$ \circ$ $\neg$												
9'									▼			
		Bottom of test pit at 9 feet below	ground surfa	ce. No refusal.								
— 10' —												
											·	
— 11'—												
12'												
12												
— 13'—											<u></u>	
İ								İ				
— 14'—												
1											1	
— 15' —												
10									1		l I	
— 16'—												
lotes:												
		field for volatile organic compounds (					ference to an	isobutylene-				
	•	d in the "PID Reading (ppm)" colum	n in parts per n	nillion. ND indica	ates no VOCs	detected.					. 1	
2. Ground	water encountered at a dep	th of 7.5 feet below ground surface.										
	Test Pit Plan	Boulder Class		Due	ortions		A 1.1.	riations	GRO	DUNDWATER	<del> </del>	
	2	Letter Size Rang	e		ortions sed		Abbre F = Fine	viations	(X)1	Encountered	1	
10		Designation Classificati A 6" - 17"		TRACE (TR.)	0 - 1	0%	M = Medium	1 .	( )N	lot Encountered	١	
-		B 18" - 36'	"	TETTE CALL	10	2004	C = Coarse V = Very		Elapsed		Depth	
		C 36" and Larg	ger	LITTLE (LI.)	10 - 2	2070	F/M = Fine		Time to Reading		to Ground-	
	NORTH	Excavation Effort EEasy		SOME (SO.)	20 - 3	35%	F/C = Fine t GR = Gray	o coarse	(Hours)		water	
olume =	6.7 cu. yd.	MModerate		AND	25.	5007	BN = Brown		0.1	0	7.5	
		DDifficult		AND	35 - 5	00%	YEL = Yellov	·				
											1	
G	GZA GeoEnvironme	ental, Inc.		1/22457/tp/tp6-9.xls								

npshire 03103  Yay Hodkinson  Windy, 40s	Contractor Operator	Dover Public Works Dover, New Hampshire  Excavation Equip Dover Public Works Shawn McClane Case Mode			Page No. File No. Checked By:	1	of 22457.0 NJN	00
ay Hodkinson	Contractor Operator Make	Excavation Equip Dover Public Works Shawn McClane						
ay Hodkinson	Operator Make	Dover Public Works Shawn McClane	ment					
ay Hodkinson	Operator Make	Dover Public Works Shawn McClane	ment					ata ang a
	Operator Make	Shawn McClane				***************************************		
Windy, 40s	Make				Date	none de la color de l'antige de		/2000
Windy, 40s		Cace Mode			Ground Elev			Plan
	Capacity			perL ft.	Time Started Time Comple			300
		1/3 cu. yd. Reach	10		Time Compi		1320	
	Soil Description			Sample	PID		Boulders:	
	. D		l	No.	Reading	Excav.	Count/	Not
					(ppm)	Effort	Class	No
ne to coarse SAND, trace Silt, Gravel.						_		
						E		1
								_
				S-1	ND			
e to coarse SAND, little Silt, brick (30%	b), metal (5%).							
				0.0	ND	$oxed{oxed}$		
I (50%) and GRAVEL.				S-2	NID			
D. F. C	balow ground and	face No refusal			מא	ļ		
Bottom of test pit at 4.7 feet	below ground sur	iace. No iciusai.				1		3
								<u> </u>
								<b></b>
						<u> </u>		
							<del> </del>	
							1	
						1		<b>†</b>
						ļ		
						-	-	-
							1 4 4 4	1
				1		.1	<u> </u>	<u> </u>
	Bottom of test pit at 4.7 feet  Bottom of test pit at 4.7 feet  rere screened in the field for volatile org.  Results are reported in the "PID Read was encountered 4.3 feet below ground states."	e to coarse SAND, little Silt, brick (30%), metal (5%).  If (50%) and GRAVEL.  Bottom of test pit at 4.7 feet below ground sur	e to coarse SAND, little Silt, brick (30%), metal (5%).  H (50%) and GRAVEL.  Bottom of test pit at 4.7 feet below ground surface. No refusal.  ere screened in the field for volatile organic compounds (VOCs) using a TEI M.  Results are reported in the "PID Reading (ppm)" column in parts per million. was encountered 4.3 feet below ground surface.	e to coarse SAND, little Silt, brick (30%), metal (5%).  If (50%) and GRAVEL.  Bottom of test pit at 4.7 feet below ground surface. No refusal.  Pere screened in the field for volatile organic compounds (VOCs) using a TEI Model 580B Organ. Results are reported in the "PID Reading (ppm)" column in parts per million. ND indicates now as encountered 4.3 feet below ground surface.	e to coarse SAND, little Silt, brick (30%), metal (5%).  H (50%) and GRAVEL.  Bottom of test pit at 4.7 feet below ground surface. No refusal.  S-2  Server escreened in the field for volatile organic compounds (VOCs) using a TEI Model 580B Organic Vapor. Results are reported in the "PID Reading (ppm)" column in parts per million. ND indicates no VOCs days encountered 4.3 feet below ground surface.	eto coarse SAND, little Silt, brick (30%), metal (5%).  H (50%) and GRAVEL.  Bottom of test pit at 4.7 feet below ground surface. No refusal.  Bottom of test pit at 4.7 feet below ground surface. No refusal.  S-2  ND  ND  Results are reported in the field for volatile organic compounds (VOCs) using a TEI Model 580B Organic Vapor Meter referer. Results are reported in the "PID Reading (ppm)" column in parts per million. ND indicates no VOCs detected. was encountered 4.3 feet below ground surface.	et to coarse SAND, little Silt, brick (30%), metal (5%).  A (50%) and GRAVEL.  Bottom of test pit at 4.7 feet below ground surface. No refusal.  Bottom of test pit at 4.7 feet below ground surface. No refusal.  Bottom of test pit at 4.7 feet below ground surface. No refusal.  Bottom of test pit at 4.7 feet below ground surface. No refusal.  Bottom of test pit at 4.7 feet below ground surface. No refusal.	e to coarse SAND, little Silt, brick (30%), metal (5%).  Bottom of test pit at 4.7 feet below ground surface. No refusal.  Bottom of test pit at 4.7 feet below ground surface. No refusal.

	nvironmental, Inc.			D D.11. v				Test Pit No.			TP2-10	
Engineers/	Scientists			Dover Public V				Page No.		1	of	1
000 TT	. D J			Dover, New Har	npsnire			File No. Checked By:			22457.0	00
380 Harvey	r Road r, New Hampshire 03103	3						Checked by:			NJN	
Manchester	, ivew Hampsime object	,		Excavation	n Equipmer	nt						
GZA Rep.	Jay Hodkinso	n	Contractor	Dover Public V		•••		Date			04/11	1/2000
OZMRep.	juy 110didiao		Operator	Shawn McClar				Ground Elev				Plan
Weather	Windy, 40s		Make	Case	Model	580 Sı	merL.	Time Started			-	315
,,canici	712taj/ 100		16	ft.	Time Comple	eted						
Depth		Soi	1 Description				Sample	PID		Bould	ders:	
- 1			•				No.	Reading	Exca	I		Note
								(ppm)	Effo		ass	No.
0	Brown, fine to coarse SA	ND, trace Silt.										
									Ε			1
— 1'——									1			
0.												
2'												
3'								ND				
											- 1	
_ 4' —	Black, fine to coarse SAN	ND, leather clippings, bottles. He		soil, bricks (5%),	, newspaper	r (5%).	S-1					2
7		(RIVER DREI	DGINGS)					1		- 1	- 1	
<b>—</b> 5' <b>—</b>												
	F	Bottom of test pit at 9.5 feet belov	v ground surf	ace. No refusal.								
— 6' —												3
, i											- 1	
<u> </u>											$\rightarrow$	
											- 1	
<u> </u>												
						j					- 1	
— 9'—						İ				-	-+	
— 10' —											$\dashv$	
										i	- 1	
11'								<b> </b>		+	$\rightarrow$	
											1	
<del></del>											$\dashv$	
										-		
— 13' —												
										1		
14'											$\neg \uparrow$	
451										l	1	
— 15' —										T		
											İ	
— 16' —						l						
ŀ												
Notes:												
in-air st 2. Ground	andard. Results are reporte	Tield for volatile organic compounds d in the "PID Reading (ppm)" colunt depth of 3.2 feet below ground surf g walls.	n in parts per r				erence to an	isobutylene-				
	Test Pit Plan	Boulder Class			ortions			viations	ł	GROUNDW		·
	3	Letter Size Ran Designation Classificat			sed		F = Fine M = Mediun	<b>-</b>		X ) Encounts ) Not Enco		
10		Designation Classificat A 6" - 17		TRACE (TR.)	0 -	10%	M = Mediun C = Coarse	11	I			
	7	В 18" - 36	6"	LITTLE (LI.)	10 -	- 20%	V = Very			psed ne to	D to	Depth
	/'	C 36" and La	rger	( <i>D</i> 1.)	10-		F/M = Fine : F/C = Fine t			ading	G	round-
	NORTH	Excavation Effort EEasy		SOME (SO.)	20 -	- 35%	GR = Gray	- CUMPAC		ours)	W	/ater
Volume =	5.6 cu. yd.	MModerate			2 -		BN = Brown		$\vdash$	0.15	T	3.2'
* Olume -	5.0 cu. yu.	DDifficult		AND	35 -	- 50%	YEL = Yellov	w	$\vdash$	V.1.2	<del>                                     </del>	J.2
				·								
G	GZA GeoEnvironme	ental, Inc.		I/22457/tp/tp15-18.xls								

GZA GeoEnvironmental, Inc.  Dover Public Works									TP2-17			
	Geognitronmental, Inc.  Dover Public Works  Dover, New Hampshire							1 of 1				
		File No.		22457.00								
380 Harvey	Road	-					Checked By:		NJN			
Manchester,	New Hampshire 03103						The state of the s			A CONTRACTOR OF THE CONTRACTOR		
				n Equipmen	ıı		Date		04/1	1/2000		
GZA Rep.	Jay Hodkinson	Contractor	Dover Public V		Tarin 1984	*	Ground Elev.			1/2000 Plan		
		Operator	Shawn McClar		580 Su	nerl	Time Started			315		
Weather	Windy, 40s	Make	Case	Model Reach	16	ft.	Time Comple	ted		330		
		Capacity	1/3 cu. yd.	Reach		11.	Inic comple					
	C	oil Description		····		Sample	PID		Boulders:			
Depth	50	Description	-			No.	Reading	Excav.	Count/	Note		
							(ppm)	Effort	Class	No.		
<del>├</del> ─ <sup>○</sup> ─┼	Brown, fine to coarse SAND, little Silt.											
	2,0,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,							E		1		
├ 1'- <del>- </del>								1				
								<del></del>	ļ			
2'	·								-			
,				(a = 0( )				<del>                                     </del>	<del>                                     </del>	<b> </b>		
3' <del> </del>	Black, fine to coarse SAND, little Silt, Clay pockets, bot	tles (1%), bricl	ks (5%), 1 tire, asl	ı (15%),								
1	wood (10%).							<del></del>	<del> </del>	2		
4' <del> </del>								↓				
L 5' →		1 .	fora No mafera-1					<del>  ▼</del>	<del> </del>	<b> </b>		
- 5-	Bottom of test pit at 5 feet belo	w ground sur	race. No rerusal.					1		3		
L 6'-									<b>†</b>	<del>                                     </del>		
<b>├</b> 7' <b>├</b>												
								1				
8'-												
							<u></u>		<u> </u>			
9 —						1						
						1						
10'												
								ļ		<u> </u>		
11'-	1					}	1					
n <sub>0</sub>								<u> </u>	<del> </del>	<b> </b>		
12'	1							1	1			
101	A Company of the Comp							<del> </del>		<del> </del>		
13'	]					1			1			
14'—	A A CONTRACTOR OF THE CONTRACT							<u> </u>	-			
14									1			
15'-	And the second second						<b> </b>	<del>                                     </del>	<del> </del>	<del> </del>		
"							1	1	1			
16'—	I the second of							<del>                                     </del>	1	1		
1												
L.						<u></u>						
Notes:							in tenture 1					
1. Soil sa	amples were screened in the field for volatile organic compou	nds (VOCs) usi	ing a TEI Model 58	OB Organic	Vapor Meter r	ererence to	an isobutylene-					
in-air	standard. Results are reported in the "PID Reading (ppm)" co	olumn in parts p	er million. ND inc	neates no VC	Cs detected.							
2. Groun	ndwater was encountered at a depth of 4 feet below ground su	пасе.										
3. Test p	oit terminated due to collapsing walls.											
	T. a Dia Dia					T	shenwint'	1 . (	GROUNDWATE	ER .		
	Test Pit Plan Boulder Class	e Range	P	roportions Used		F = Fine	breviations	1	K) Encountered			
		e Kange sification	TRACE (TR.)		0 - 10%	M = Med	lium		) Not Encounte	ered		
3	A 6	o" - 17"	IRACE (IR.)			C = Coar		Elap	sed	Depth		
	- AA	8" - 36" nd Larger	LITTLE (LI.)		10 - 20%	V = Very F/M = F	ine to medium	Tim	e to	to Ground		
	Excavation Effort	ne tenter	gov == /55 :		20 250/	F/C = Fi	ine to coarse	Rea (Ho	ding urs)	Ground- water		
	NORTH EEasy		SOME (SO.)		20 - 35%	GR = Gr BN = Br		(110	···			
Volume =	MModerate		AND		35 - 50%	YEL = Y			0.10	4.0'		
1	DDifficult											
	CZA CasEmpirenmental Inc		1/22457/m/m15.1	01								

	invironmental, Inc.		Dover Public V	P			Test Pit No.		TP2-1	
Engineers/	'Scientists			Page No. File No.	of 1 22457.00					
380 Harvey	y Road - · ·	-	Dover, New Ha				Checked By:		NJN	
Manchester	r, New Hampshire 03103		Evenyatio	n Equipment					-	
GZA Rep.	Jay Hodkinson	Contractor	Dover Public V				Date		04/1	1/2000
<u></u>				Ground Elev		See	Plan			
Weather	Windy, 40s	Make	Case	Model	580 St		Time Started		1445	
		Capacity	1/3 cu. yd.	Reach	16	ft.	Time Comple	eted	1	500
Depth	S	Soil Description				Sample	PID		Boulders:	
•						No.	Reading	Excav.	Count/	Note
0	Brown, fine to coarse SAND, trace Silt with Gravel.						(ppm)	Effort	Class	No.
	Blown, the to coarse SAND, trace out with Graver.							Е		1
1'	·							ı		
2'										
	Black, fine to coarse SAND, little Silt with bricks.						ND			
— 3¹—	black, line to course of it vo, it the one with offices.									
- 4'	Orange-brown, fine SAND, some Silt.									
— 5' —			•							
<b>.</b>										
6'										
7' <del></del>								<del></del>		2
0,	Bottom of test pit at 7.4 fe	et below groun	nd surface.							-
8'	-	_								
9'										
— 10' —										
— 11'—										
- 11										
12'										
401										<u> </u>
— 13' —					İ					
— 14' —					1					
										1
— 15' —					l					
— <sub>16'</sub> —										
							<u> </u>			
Notes:		·							L	
1. Soil sai	mples were screened in the field for volatile organic compoun	ds (VOCs) using	a TEI Model 580I	3 Organic Vapo	or Meter ref	ference to an	isobutylene-			
in-air s	standard. Results are reported in the "PID Reading (ppm)" col	umn in parts per	million. ND indic	ates no VOCs	detected.					
2. Ground	dwater encountered at a depth of 7 feet below ground surface.									
	Test Pit Plan Boulder Class  11 Letter Size F	?ange		ortions Ised	Į	Abbre F = Fine	eviations	1	OUNDWATER Encountered	
3	Designation Classif	ication	TRACE (TR.)	0 - 10	0%	M = Mediur	m		Not Encountere	đ
<u> </u>		- 17" - 36"		10.5	2094	C = Coarse V = Very		Elapse		Depth
	C 36" and	Larger	LITTLE (LI.)	10 - 2	2070	F/M = Fine F/C = Fine		Time to Readin	ıg	to Ground-
	NORTH EEasy		SOME (SO.)	20 - 3	35%	GR = Gray		(Hours		water
Volume =	9.0 cu. yd. MModerate DDifficult		AND	35 - 5	50%	BN = Brown YEL = Yello		0	.1	7.0'
	DDifficult		<u>L.</u>							
G	GZA GeoEnvironmental, Inc.		1/22/157/m/m15_18 v1c	_						

# APPENDIX D

DECEMBER 1999 AND APRIL 2000 SAMPLING SUMMARY, ANALYTICAL LABORATORY REPORTS, AND DATA VALIDATION

### TABLE 1 Sample Summary Table

Dover Department of Public Works River Street, Dover, New Hampshire

			The second second second second second							Switz nate 212		Terrania in St			
April 18 Control	gapingan nga sa	7					mu di	Sc			101-01	a page	e Grouni PATI	A PROPERTY.	Victor
Spinie)ie	+## Datos							VOLS	6010B/	0.024	8081A4		\$2.7(0)C	X 2/(10)E5	
A Location/			Boutom		Deptii	FRANCISCO PROPERTY.	8270C	48260B	(31)1016)# 		80824		NO.		100
<u>Djēsijanation</u>		(100)	W(feet)						1 /1 / 4	Service Control of th	MANUTO ESTADO	SECURIOR MANORAN			
TP - 1	12/20/1999	48	15	15	11 - 12	<del></del>		X	x			х		X	X
TP - 2	12/20/1999	36	8.5	8	5 - 7	X	77	X	X				X	X	X
TP - 3	12/20/1999	38	11	11.5	11 - 11.5	7.5	X	X	X				X	<u> </u>	X
TP - 4	12/21/1999	26	8.6	7	5 - 6	X		X					- 12		
TP - 5	12/21/1999	22	6		5.5 - 6		X	X	x				х	Х	X
TP - 6	12/21/1999	8	7	7	4 - 5	X	- V	^_	X		<b></b>				
TP - 8	12/21/1999	8	6	6	3 - 4		X	X	X				Х	X	X
TP - 9	12/21/1999	16	4.5	4.5	2 - 3	X	X	X	$\frac{x}{x}$		-	X		X	X
TP - 10	12/21/1999	14	10	10	6-7			X	X			<del> </del>		X	
TP - 11	12/22/1999	14	13	13	4 - 5	X	X	<del>  ^</del> -	X		<del> </del>	<del>                                     </del>	X		X *
TP - 12	12/22/1999	14	9	9	4 - 5		X	x	1-2-1		<del> </del>	<del> </del>	X		X
TP - 13	12/22/1999	16	8.5	8.5	2 - 3			<u> </u>	x		<del>                                     </del>	<b>†</b>	X		X
TP - 14	12/22/1999	14	12	12	7 - 9				<del>  ^</del>		<del>                                     </del>	†	X		X
TP - 17	12/22/1999	32	9	9	6-7			Х							
TP - 18	12/22/1999	32	8	8	2 - 3			<u> </u>	-	Х	X				
TP - 19	12/22/1999	56	1.5		0 - 0.5		X	<del> </del>	X				1		1
TP2-5	04/11/2000	15	7.7	5.3	5.5-7		X	<del> </del>	$\frac{x}{x}$						
TP2-16	04/11/2000	10	9.5	3.2	3-4	ļ	<del>  ^</del> -	├	<del>  ^</del> -		<del> </del>	<del> </del>	X	х	X
WP - 1	12/20/1999	-	5	2.7			<u> </u>	-	+		<b></b>	1	X	<b></b>	X
MW-1	04/21/2000	-	17	10.4		<u> </u>		<del>                                     </del>	<del> </del>	<u> </u>		X		Х	X
MW - 5	12/22/1999		10	5.4					<del></del>			X		X	X
MW- 8A	12/20/1999	-	10	5.0	<u> </u>	ļ		+		<del>                                     </del>	<b>-</b>	1	x	X	X
MW - 10	12/21/1999		10	1.9	<u> </u>	<u> </u>	<del> </del>	┼		<b>-</b>		1	X		X
MW - 12	12/20/1999		13	8.3	<u> </u>	<del> </del>			+				X		X
MW - 13	12/21/1999		10	7.1	<del>-</del> -	<u> </u>	-			+		┪	X	1	X
MW-14	04/21/2000		13	4.6	<del> </del>	<u> </u>		+		<b></b>			X		X
GZ-1	04/21/2000		13	6.0	<del> </del>	<del> </del>	+	+	+	<b>-</b>		1	X	1	X
GZ-2	04/21/2000		14	9.6	-	<b>├</b> ──			<del> </del>	-	1		X	T	X
GZ-3	04/21/2000	<u> </u>	8	3.7			+		$\frac{1}{x}$	<b>-</b>				1	1
SS-1	04/21/2000	16	0.5	NE	0-0.5		+^-	+	X	1		1			
SS-2	04/21/2000	14	11	NE	0-1	<del> </del>	+	-	1 X	<b>-</b>					
SS-3	04/21/2000	10	11	NE	0-1	<del> </del>	$\frac{1}{x}$	+	$\frac{x}{x}$	+	1	1		1	1
SS-4	04/21/2000	16	1	NE	0-1	<del> </del>	$\frac{x}{x}$	+	$\frac{X}{X}$	+	<del>                                     </del>	1	1	1	1
SS-5	04/21/2000	12	1	NE	0-1	<del> </del>	$\frac{\lambda}{X}$	+	$\frac{\Lambda}{X}$	+		<del></del>			T
SS-6	04/21/2000	12	1	NE	0-1	-	$\frac{\Lambda}{X}$	+	$\frac{x}{x}$	+	1				1
SS-7	04/21/2000	40	0.5	NE	0-0.5	<del>                                     </del>	+-^-	+	$\frac{\Lambda}{X}$	+		- <del> </del>	1	1	1
SS-8	04/21/2000	39	11	NE	0-1	<del> </del>		+	$\frac{\lambda}{x}$	+		<del>                                     </del>	<b>-</b>	1	$\top$
SS-9	04/21/2000	19	1 1	NE NE	0-1	+	+	+	$\frac{\lambda}{X}$	1		1	1	1	
SS-10	04/21/2000	47	1	NE	0-1	<u> </u>						<del></del>			

<sup>1.</sup> GZA GeoEnvironmental, Inc. collected soil and groundwater sample at December 1999 test pit excavations (TP-series), soil samples at April 2000 test pits (TP2-series), soil samples at surficial sampling locations (SS-series), and groundwater samples at existing monitoring wells (WP-1 and MW-series) and new monitoring wells (GZ-series) for the analyses indicated in the table. Samples were analyzed by Eastern Analytical, Inc. for volatile organic compounds (VOCs) for acid/base/neutral (ABNs) extractable semi-VOCs, polynuclear aromatic hydrocarbons (PAHs), the eight RCRA metals, and/or herbicides (herb) and pesticides (pest). EPA Method numbers are indicated below the parameter heading.

Refer to laboratory analytical results on Tables 1 and 2.

## Dover Department of Public Works River Street, Dover, New Hampshire

### Data Validation and Data Usability

The selected laboratory (Eastern Analytical, Inc) prepared a Level I data validation type data package for the analytical work performed by this study and included in this Appendix. GZA GeoEnvironmental, Inc. reviewed the laboratory's data package to determine whether there would be any qualifications in regards to the use of the analytical data.

Eastern Analytical, Inc. noted no sample irregularities in preservation or sample condition when the samples were received. All samples were analyzed within the allowed holding times. Duplicate field samples were comparable to the their corresponding field sample. Matrix spikes and matrix spike duplicates had comparable analytical results and acceptable recoveries.

Method blanks were free of any contamination, with one exception; specifically, the method blank for EPA Method 8260B (12-20-99) contained low levels of four analytes that were the result of carryover from a prior analysis. With the exception of naphthalene, these analytes were not found in the field samples. Naphthalene was detected at appreciable concentrations in only one soil sample and two aqueous samples. The naphthalene concentration for the soil sample from TP-5 is an estimate due to an instrument problem. This estimate and the other detected and appreciable napthalene concentrations were reasonable in consideration of field observations and site conditions in the vicinity of the sampling locations.

Sample surrogate recoveries and matrix spike(s) and/or laboratory control sample(s) met project criteria with the following exceptions:

- For the soil sample from TP-5, the surrogate recoveries of 1,2-dichlorobenzene-D4 is high due to high concentrations of hydrocarbons. There is a possible high bias for the reported volatile organic compound (VOC) concentrations. Of the VOCs detected in the soil sample from TP-5, only alkylbenzenes are reported to be above S-1 and S-2 standards. TP-5 is located in the vicinity of tank area A/B/C, which is currently under corrective action in accordance with New Hampshire Underground Storage Tank Rules.
- The TP-2 aqueous sample surrogate recovery (2-Fluorobiphenyl 40%) was outside acceptance limits for Acid Extractable/Base Neutral analysis. However, there is no data impact as the method allows one acid extractable and one base neutral surrogate to be out of control with no further action necessary. Surrogate recoveries reported as diluted outside recovery.
- The recovery for mercury in the matrix spike duplicate (12/30/99) was just outside the acceptable limits. No appreciable impact on the reported concentrations is expected.

- The matrix spike and matrix spike duplicate (12/30/99) were below acceptance limits for both barium and lead. The concentration of the parent sample for these two elements were greater than four times the spiking concentration. There is no impact on the reported concentrations.
- Aqueous sample GZ-1 (5/3/00) exceeded surrogate recovery limits (low) for p-Terphenyl-d14 (18%). A severe emulsion was noted during the extraction procedure. Reported polynuclear aromatic hydrocarbon (PAH) concentrations are estimates with possible low bias. Reported PAH concentrations for the GZ-1 sample are very low or non-detect. Very low PAH concentrations are also reported for a grab groundwater sample from nearby test pit TP-12 (within about 100 feet) in similar buried materials, which collaborates the GZ-1 data.
- Soil samples SS-4, SS-5, SS-6 and SS-6A exceeded Internal Standard (ISTD) Area limits (low) for Perylene-d12. Samples were reanalyzed with similar ISTD failures and results. Suspected failures are due to the presence of non-target compounds in the sample matrix. A high concentration bias is possible for the following compounds in the affected samples: benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, dibenz(a,h)anthracene, and benzo(g,h,I)perylene. None of these analytes were reported at concentrations that would require a response action.

The data completeness goal of 90 percent was achieved.

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