

CONSULTANTS
• GEOTECHNICAL
• MATERIALS

ENVIRONMENTAL

March 25, 2005

Minneapolis, MN 55403 50 Groveland Terrace, Suite A Klodt, Inc.

WPCA, REM DIVISION PLR/SF SECTION

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2006

RECIEVED

Attn: John Bell

RE: Report of Phase II Environmental Site Assessment

South Minneapolis Apartment Project

Minneapolis, Minnesota

AET Project No. 03-02255ii.u

Dear Mr. Bell:

with our proposal agreements no. 3-04-409 and 3-05-062. above-referenced property in Minneapolis, Minnesota. This work was performed in accordance American Engineering Testing, Inc. has completed Environmental Assessment services at the

please contact me. questions regarding the information presented in this report, or if we can be of additional service, We appreciate the opportunity to have been of service to you on this project. If you have any

Sincerely,

American Engineering Testing, Inc.

Charles W. Bisek

Senior Environmental Scientist

Phone: (651) 659-1310

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 Environmental Sampling Methods (2), General Environmental Sampling Methods: Excavations/Test Pits, Hand Auger Borings, Surficial Soils, Stockpiles
- Laboratory Analytical Reports and Chain-of-Custody Records

REPORT OF PHASE II ENVIRONMENTAL SITE ASSESSMENT SOUTH MINNEAPOLIS APARTMENT PROJECT MINNEAPOLIS, MINNESOTA

AET Project # 03-02255ii.u

1.0 INTRODUCTION

Apartment Project site in Minneapolis, Minnesota. American Engineering Testing, Inc. (AET) conducted at the proposed South Minneapolis This report contains the results of Phase II Environmental Site Assessment services that

1.1 Purpose

subsurface soils at the subject site The purpose of performing the Phase II Environmental Site Assessment is to characterize the

1.2 Scope of Services

Klodt, Inc. and includes the following items: (proposal no. 3-04-409) and February 1, 2005 (proposal no. 3-05-062) proposal agreements with The scope of our environmental assessment services was outlined in our December 22, 2004

- Clear underground utilities through the Gopher State One Call system
- proposed boring locations. Subcontract with a private utility locator to clear private underground utilities at the
- Perform GeoprobeTM (push probe) and hand auger borings at the site
- probe, hand auger, and standard penetration borings with a photoionization detector Provide an environmental technician to screen soil samples recovered from the push (PID) for the presence of organic vapors
- Submit representative soil samples collected from the borings to the laboratory for
- Prepare a written report summarizing the results of field work and laboratory analysis.

standard penetration borings has been reported under separate cover. The recent \triangleright standard penetration borings were done for both environmental report addressing the geotechnical properties of the soils encountered in the and geotechnical

1.3 Limitations and Exceptions of Assessment

sampling as part of recently proposed scope of services known to us related to recognized we will not be responsible, given this Scope of Assessment Work. You should be aware that, even though we follow the current ASTM standard practice there may be localized contamination at the site that we cannot ascertain and for which previously or not reasonably discoverable at the time of our field exploration and environmental conditions not identified in the Phase I ESA, Such contamination could be not made for this

equipment, supplies, products, etc. did not allow access to all locations within the buildings. supplies, products, etc. At the time we performed our field work, both buildings were used for storage of equipment, associated with the former occupant of the buildings. The presence of

1.4 Reliance

Inc. for specific application to the site. This Phase II Environmental Site Assessment has been prepared for the exclusive use of Klodt,

2.0 BACKGROUND

2.1 PROPERTY Description and Features

industrially developed area and adjacent to a residentially developed area in Minneapolis. location of this site is shown on Figure 1. The South Minneapolis Apartment Project site is comprised of about 4.16 acres located in an The

additions have been constructed since that time. Development initially began at the south end of the site in about 1925. Historical use of buildings at the site has Various buildings and

corner of the site have since been removed. included a laundry, creamery, bottling company, laboratory, manufacturing, production of hair products, production of organic fertilizer, etc. (USTs) used to store gasoline, diesel fuel, and drain oil had been in use but reportedly A UST used to store alcohol is still present near the southeast In addition, various underground storage

2.2 Proposed Construction

underground structures will be transported off-site for disposal. have underground parking/garages. apartment buildings, along with some retail development. We understand plans include demolishing the buildings that currently exist and constructing Excess soil generated in conjunction with excavating these The buildings proposed at the site will

2.3 Previous Environmental Assessment.

recognized environmental conditions associated with the subject property. the report of AET Project No. 03-02255 dated January 19, 2005. AET previously performed a Phase I ESA for the site, the results of which were included in AET identified the following

- Former spills.
- manufacturing facility Use of buildings as a laundry, creamery, car shop, machine shop, repair building, and
- ASTs, USTs, dispensing pumps, associated piping, and oil burners
- Floor drains, associated separators and piping, and dry well.

Phase II ESA are incorporated in the present report. the report of AET project no. 03-02255ii dated February 4, 2005. AET also prepared a Phase II ESA for the subject site. The results of that ESA were included in The results of AETs previous

3.0 ENVIRONMENTAL ASSESSMENT

3.1 Field Exploration Procedures

locations are shown on Figure 2. Logs of the borings are included in Appendix A. 1A, GP-6A, GP-12, GP-13, 6A, 7A and 8A were drilled on February 22, 2005. HA-1A was drilled as an extension of boring HA-1 on February 21 and 22, 2005; borings exterior areas of the site between December 29, 2004 and January 4, 2005; hand auger boring the large building at the site on December 22; eight standard penetration borings were drilled in and 22; push-probe borings GP-8 through GP-11 and hand auger boring HA-1 were done within borings, numbered GP-1 through GP-7, were done in exterior areas of the site on December 21 period of December 21, 2004 through February 22, 2005. The field exploration and sampling that AET recently performed at the site was done during the Specifically, seven push-probe The boring GP-

.2 Rational for Selecting Sampling Locations

Rationale used for selecting specific sampling locations is presented below

- historical aerial photographs, unidentified items had been stored/stockpiled Borings GP-1, GP-1A, GP-6 and GP-6A were drilled in areas of the site where, based on
- . previously been present Borings GP-2, GP-5, GP-8, and GP-12 were drilled in areas where petroleum USTs had
- Borings GP-3 and GP-4 were drilled in areas where drain oil USTs had previously been

•

- GP-7 was done adjacent to an existing alcohol UST.
- previously been present Boring GP-9 was drilled in the building in an area where fuel dispensing pumps had
- drilled in the building in the vicinity of a sewer sediment trap/separator. Boring GP-10 was drilled in the building near a trench floor drain and boring GP-11 was

.

- diked area where organic fertilizer had previously been stored Boring GP-13 was drilled near the northwest corner of the warehouse and adjacent to
- Borings HA-1 and HA-1A were drilled in a dry well within the basement boiler room

- Borings remaining borings were done at other accessible areas in the north half of the site previously been stored; boring 1 was drilled in the vicinity of the alcohol UST; the drilled along drainage ports associated with a diked area where organic fertilizer drilled in areas where residences had previously been present; borings 8 and 8A were properties of soils throughout the site. through ∞ were drilled at exterior locations to assess Of these eight borings, borings 2 and 4 were the geotechnical
- 7, respectively where near surface soil contamination was identified Borings 6A and 7A were drilled adjacent to previous standard penetration borings 6 and

3.3 Contamination Reduction

Appendix B for contamination reduction procedures followed In conjunction with performing the borings, steam cleaning and/or cleaning procedures prior to beginning and during field operations. Refer to the sheets included in were

3.4 Field Screening/Sample Observations

sheets included in Appendix B for screening procedures detector (PID) equipped with a 10.6 electron volt (eV) lamp. Soil samples collected from the borings were screened in the field with a photoionization Refer to the previously described

are summarized in Tables 1 and 1A. The PID screening results are shown in the right hand column on the soil boring logs and they

boring logs are attached as Appendix A presence of debris. The samples were also visually observed for evidence of contamination, obvious odors, and the If present, evidence of contamination, odors, etc. was noted on the logs. The

3.5 Soil Sampling

conjunction with borings. Refer to the attached sheets included in Appendix B for information concerning soil sampling in

3.6 Soil Sample Collection for Chemical Analysis

and polychlorinated biphenyls (PCBs), polynuclear aromatic hydrocarbons (PAHs), nitrogen, and diesel range organics (DRO), gasoline range organics (GRO), benzene, ethyl benzene, toluene, appropriate analysis to characterize these materials. Laboratory analysis of soil samples included Soil samples were collected and submitted to Legend Technical Services, Inc. (Legend) for (BETX), volatile organic compounds (VOCs), RCRA metals, cyanide,

DRO Sampling

moisture determination. were placed in a tared 60 ml vial. Soil samples were collected using clean disposable gloves. Another container was completely filled and submitted for Approximately 25 grams of soil/fill

GRO, BETX, and VOC Sampling

wiped clean, the cap was sealed and the vial shaken and checked for leakage. Soil generally performed in accordance with EPA Method SW-845 5035 GRO/BETX vial containing 25 ml of purge and trap grade methanol. After the vial threads were appropriate containers. samples were collected using clean disposable gloves. Approximately 25 grams of soil were placed in a Samples were collected Sampling was tared 60 ml Ħ.

RCRA Metal and Cyanide Sampling

was filled with soil. Soil remaining on the threads was wiped off and the lid secured. Soil sample collection was done using clean disposable gloves. A 100 to 250 ml plastic bottle

PCB Sampling

containers. Soil samples were collected using clean disposal gloves. Samples were collected in appropriate

PAH Sampling

Soil sample collection was done using clean disposable gloves. Soil remaining on the threads was wiped off and the lid secured A 60 ml glass jar was filled with

Nitrogen & Total Kjeldahl Nitrogen & pH Sampling

appropriate containers samples were collected using clean disposable gloves. Samples were collected Ħ.

General Information Regarding Soil Sampling

used for analytical testing disposable gloves, clean spatulas, etc.) was used. To minimize the possibility of cross contamination, dedicated sampling equipment (clean new to expose fresh soil. Soil previously used for soil screening or for classification was not Prior to collecting samples, a fresh cut was

record which accompanied the samples of person collecting number, sample location and depth, time and date sampled, analysis to be completed and name At the time of collection, sample jars were labeled with the following information: AET project the sample. This information was also entered on the chain-of-custody

chain-of-custody forms, for chemical analysis All soil samples were placed in a chilled cooler and delivered to Legend, accompanied with

4.0 BORING RESULTS

describing terminology used on the boring and test pit logs. the individual boring locations. Tables 1 and 1A. Refer to the logs of the soil borings for soil profiles, observations, and PID screening results The boring logs are included as Appendix A. The results of the PID screening results are also summarized in Appendix B contains sheets at

readings, obvious odors, and visual evidence of contamination are also discussed Presented below is a brief summary of subsurface conditions encountered in the borings. PH

4.1 Push-Probe Borings

coarse alluvium (sand). from borings GP-1, GP-2, GP-3, and GP-9. of silty sand, lean clay, and sand. Fill ranging from 3' to about 111/2' thick was encountered in these borings. 2½' depth in boring GP-12. Soil encountered below the fill is fine alluvium (lean clay) or Pieces of bituminous and/or concrete were observed in fill Possible cinders were noted in fill between the 2' The fill is comprised

Petroleum odors were noted in fill samples collected from borings GP-1, GP-7, and GP-9.

borings. PID readings ranged from 0.0 ppm to 24.5 ppm in samples recovered from the push-probe

Groundwater was not encountered in the push-probe borings.

4.2 Hand Auger Borings

gravel was encountered between 2½ and the boring termination depth of 7' Silty sand fill was encountered to 21/2' in hand auger boring HA-1. Poorly graded sand with

No apparent petroleum/fuel odors associated with the recovered soil samples were noted

PH readings of 0.0 ppm to 22.3 ppm were recorded in fill samples recovered from the hand

Groundwater was not encountered in the hand auger borings.

4.3 Standard Penetration Borings

alluvial soils (clays and sands) and till (clayey sand). bituminous Fill ranging from ½' to about 2' thick was encountered in these borings. pavement at the surface, aggregate base, and lean clay. The fill is underlain by The fill includes

No apparent petroleum/fuel odors associated with the recovered soil samples were noted

penetration borings. readings ranged from 0.0 ppm to 0.7 ppm in samples recovered from the standard

Groundwater was measured in these borings at depths of 26' or more below the ground surface.

5.0 LABORATORY ANALYTICAL RESULTS-SOIL

site laboratory reports and chain-of-custody records are attached as Appendix C. The results of laboratory analysis performed on soil samples that AET collected at the subject are summarized in Tables 2 through 8 and discussed below. The complete Legend

are predominantly sandy. contamination, we compared the measured DRO/GRO concentrations to the MPCA established "action level" of 50 ppm hydrocarbon contamination for petroleum release sites where the soils contaminants identified, including DRO and GRO. To assess the magnitude of DRO/GRO within the soil to leach to the groundwater. SRVs and SLVs have not been established for all the health is concluded to exist. The Tier 1 SLVs are used to assess the potential for contaminants representative site contaminant concentration exceeds the SRV, unacceptable risk to human assumption that human exposure to the contaminants occurs in a residential setting. Tier 1 soil leaching values - SLVs (updated 11-2-99). Control Agency (MPCA) established residential soil reference values – SRVs (1999 version) and borings, we compared the detected concentrations of identified analytes to Minnesota Pollution To assess the magnitude of soil contamination identified in samples collected from the recent soil For assessing Total Kjeldahl Nitrogen, we compared measured Residential SRVs are based on the When a

SRVs, SLVs, CGs, and Action Levels are included, where appropriate, in Tables 2 through 7. concentrations to the Minnesota Department of Agriculture Nitrogen Cleanup Goals (CGs).

5.1 DRO

results in the DRO range in these four samples are primarily due to overlap from heavy oil range The other two samples were near surface samples from boring GP-12. collected from boring HA-1 which was drilled in the dry well located within the boiler room. concentrations above the "action level" results of DRO analysis performed in four samples. on forty XIX Two of these samples were soil samples The laboratory noted the identified DRO fill soils

overlap from heavy oil range product and samples from borings GP-6A, GP-10, 6, and 8 samples analyzed from borings GP-6 and GP-9 in which the detected DRO is most likely likely polynuclear aromatic hydrocarbons (PAHs) DRO detected display a from borings GP-1, GP-1A, GP-6A, GP-12, GP-13, HA-1, 6, associated with fuel oil/diesel fuel, the laboratory noted results in the DRO range in samples with a diked area where organic fertilizer had previously been stored. With the exception of the the northwest corner of the site; boring 8 which was drilled near dike drainage ports associated corner of the building located in the northwest corner of the site; boring 7 which was drilled in where organic fertilizer was previously stored; boring 6 which was drilled east of the southeast where a UST was previously located; boring GP-13 which was drilled adjacent to the diked area adjacent to a DRO was measured at concentrations above the reporting limit but below the "action level" drilled which fuel in areas where historical aerial photographs showed items stored/stockpiles; boring was drilled in the area of former fuel pumps; boring GP-10 which was collected trench drain in the production area; boring GP-12 which was drilled in an area Ħ. oil pattern. borings 6, in the following areas: borings GP-1, GP-1A, GP-6 and The laboratory also indicated the pattern of the chromotograms of 7, and 8 is likely not associated with fuel oil/diesel fuel but more 7, and 8 are primarily due to GP-6A, do not , which

submitted for analysis. DRO was measured below the laboratory reporting limit in the remaining thirty two samples

5.2 GRO

laboratory reporting limit in any of the samples analyzed. The results of GRO analysis performed on seven soil samples did not identify GRO above the

5.3 BETX

xylene measured in this sample was below the established SRV/SLV. five boring GP-9 which was drilled in the area of former fuel pumps. One BETX constituent, xylene, was detected above the laboratory reporting limit in samples submitted for BETX analysis. Xylene was detected in a sample collected However, the concentration of one of the from

5.4 VOCs

submitted for analysis. VOCs were not detected above the laboratory reporting limit in ten of the eleven samples

67 and 22 mg/kg, respectively. detected concentration of trichlorofluoromethane is well below the established SRV and SLV of soils collected from boring 1, which was drilled near the southeast corner of the main building This VOC was also detected in the QA/QC trip blank at a concentration of 0.49 mg/kg. One VOC - trichlorofluoromethane (Freon 11) - was detected at 0.97 mg/kg in coarse alluvial The

fertilizer had previously been stored. boring 8 which was drilled near dike drainage ports associated with a diked area where organic within the building where alcohol was used (GP-9, GP-10, GP-11, HA-1 and HA-1A), samples collected from the area of the alcohol UST (GP-7 and 1), the areas of borings done laboratory to include tentatively identifiable compounds (tics) in the analysis performed Because alcohol is not included on the standard VOC list of analytes, we No non-target analytes were identified by method 8260 requested the on

mg/kg. also be identified by method 8260 with an estimated quantitation limit in the range of 5.0 to compounds in a soil sample is approximately 0.25 mg/kg. Low molecular weight alcohols can point of less than 200C, ketones, nitriles, acetates, acrylates, ethers, Method 8260 can be used to quantitate most volatile organic compounds that have such as low molecular weight halogenated hydrocarbons, and sulfides. The typical quantitation limit for these aromatics,

5.5 Metals

laboratory reporting limit or they were detected below established SRVs and SLVs Except for one sample, the metals which were analyzed for were not detected above

trivalent. Our experience is that hexavalent chromium is seldomly encountered was unable to determine whether the chromium present in the soil sample chromium, and it is well below both the SRV and SLV for trivalent chromium. GP-10 at a depth corresponding to slightly below the bottom of the trench drain in the production Total chromium was measured at a concentration of 26 mg/kg in a sample collected from boring This value is below the SRV (71 mg/kg) and above the SLV (18 mg/kg) for hexavalent S. The laboratory hexavalent or

5.6 PCBs

for analysis. PCBs were not detected above the laboratory reporting limit in the eleven samples submitted

5.7 PAHs

analysıs. PAHs were not detected above the laboratory reporting limit in the five samples submitted for

5.8 Nitrogen and pH

been stored/stockpiled, in samples collected from borings 8, 8A, and GP-13, which were drilled drilled in an area of the site where, based on historical aerial photographs, unidentified items had Total Kjeldahl Nitrogen (TKN) was detected in a sample collected from boring GP-6 which was

detected concentrations of TKN are below established Cleanup Goals adjacent ರ ಶ diked area where organic fertilizer had previously been stored. 급 all cases

The results of pH determinations indicate the pH of the samples tested are neutral to basic

6.0 CONCLUSIONS/RECOMMENDATIONS

Officer. contamination at the site. Phase non-petroleum contaminants were also identified. of the contamination and the contamination should be reported to the Minnesota Please contact us if you want us to notify the Duty Officer on behalf of the owner П Environmental Site Assessment performed by AET to date Some of the contamination appears to be petroleum The owner of the site should be has related, documented though made Duty

likely need to be disposed at a landfill versus being re-used at another residential or commercial from the site will need to be disposed at an appropriate facility, i.e., the impacted soils will most Impacted soils excavated in conjunction with re-development activities that need to be removed

performed within the buildings may be recommended. traps/separators, etc. removed, building at the site. observations We recently completed a pre-demolition asbestos containing material (ACM) survey performed the we as performed at the time part of the perform ACM survey. The contents of the building had not been completely removed at the time that were not accessible 8 Phase walk through I ESA and at We recommend that after the contents of the building of the re-walk through, additional subsurface sampling to identify or visible the time locations of at the of the time ACM survey. surface of the walk through staining, Based of the

7.0 CLOSURE

practicing in this area, under similar budgetary and time constraints. that level of skill and care ordinarily exercised by other members of the profession currently The services performed by AET for this project have been conducted in a manner consistent with

on any of our conclusions and recommendations. immediately contacted to review these conditions and determine if there are any material impacts If conditions differing from those identified in this report are encountered, AET should be

8.0 SIGNATURES

Report Prepared By:
American Engineering Testing, Inc.

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Report Reviewed By: American Engineering Testing, Inc.

Charles W. Bisek

Sr. Environmental Scientist

Robert A. Kaiser

Vice President, Environmental Division

Table 1 Summary of PID Screening South Minneapolis Apartment Project Minneapolis, MN AET No. 03-02255.ii.u

| | | (T | (results in ppm) | m) | | |
|--------|-----------|----------|------------------|--------|------|-------|
| Boring | | | Depth (ft) | h (ft) | | |
| Number | 0-2 | 2-4 | 4-6 | 6-8 | 8-10 | 10-12 |
| GP-1 | 0.0 | 0.0 | 5.0 | 0.0 | 0.0 | 0.0 |
| GP-1A | 0.4 | 0.6 | 0.4 | - | ì | • |
| GP-2 | 0.5 | 1.2 | 1.5 | 6.5 | 0.2 | 0.2 |
| GP-3 | 0.3 | 0.2 | 2.5 | 4.5 | 4.0 | 20. |
| GP-4 | 1.5 | 5.0 | 1.5 | 3.0 | 1.0 | 1.5 |
| GP-5 | 1.5 | 2.0 | 5.5 | 6.0 | 1.5 | 1.5 |
| GP-6 | 4.0 | .05 | 1.0 | 1.0 | 0.0 | 0.0 |
| GP-6A | 0.5 | 0.4 | 1 | • | - | - |
| GP-7 | 5.9 | 7.0 | 2.0 | 2.0 | 1.6 | 2.0 |
| GP-8 | 0.5 | 0.5 | 1.0 | 2.0 | 1.0 | 1.0 |
| GP-9 | 0.5 | 0.5 | 24.5 | 1.5 | * | 1 |
| GP-10 | 0.5 | 1.0 | 1.0 | 1.0 | 0.5 | 0.5 |
| GP-11 | 0.0 | 0.0 | 1.0 | 0.5 | 0.0 | 0.0 |
| GP-12 | 0.4 | 0.3 | 0.6 | 0.5 | 0.4 | 0.3 |
| GP-13 | 0.5 | 0.4 | - | • | * | Œ. |
| HA-1 | 0.0 | - | - | - | - | 0.0 |
| HA-1A | 0.01/0.2* | 0.5/3.2* | 22.3/0.4* | 0.5** | 3 | |
| | | | | | | |

- Indicates sample not screened with PID
- PID readings of top half of sample/bottom half of sample
- ** Boring terminated at 7'.

0.0 0.3 0.0 0.4 0.0 0.0 0.0 0.3 2-4 41/2-6 South Minneapolis Apartment Project 0.0 0.2 0.0 0.0 0.0 2 0.1 0.7 Summary of PID Screening AET No. 03-02255.ii.u 7-81/2 0.0 0.0 0.0 0.0 0.0 0.0 0.6 Minneapolis, MN (results in ppm) Table 1A 91/2-11 0.0 0.0 0.0 0.0 0.0 0.1 0.1 Depth (ft) 12-131/2 0.0 0.0 0.0 0.0 0.0 0.0 0.0 141/2-16 0.0 0.0 0.0 191/2-21 0.0 0.0 0.0 241/2-26 | 291/2-31

Number Boring

0-2

6A

6 S

> 0.0 0.0 0.0 0.0 0.1

> > 0.1 0.0 0.1

> > 0.0 0.0 0.0

1

J

7_A ∞

> 0.2 0.4 0.2 0.0

0.2

0.0

0.5

0.4 0.0 0.2

0.0

0.0

0.0

Indicates sample not screened with PID

South Minneapolis Apartment Project Summary of DRO Analysis AET No. 03-02255.ii.u Minneapolis, MN Table 2

(results in mg/kg)

| 011 | 8 ^ | C | 8 | /A | 7, | , | 7 | 0.11 | 64 | C | 6 | 5 | 4 | w | 2 | ٢ | _1 | 177-177 | на_1 м | 1-7411 | uл 1 | OI=13 | CD 13 | OF-12 | CD 10 | GF-11 | Cm 11 | GP-10 | | GP-9 | GP-8 | | GP-7 | GF-0A | CD () | GP-0 | | GP-5 | GP-4 | GP-3 | GP-2 | GP-1A | GP-1 | Sorre Printers | Roring Number |
|-----|-----|----------|-----------|-----|-----|-------|---------|------|-----|----------|-----------|-----|-----|-----|-----|----------|--------|---------|--------|----------|---------|----------|---------|----------|---------|-------|-------|-------|--------|------|------|------|------|-------|------------|------|-----|------|------|------|------|---------|------|----------------|---------------|
| 4-6 | 2-4 | 12-131/2 | 0-2 | 4-6 | 2-4 | 12-14 | 0-2 | 4-6 | 2-4 | 12-131/2 | 0-2 | 2-4 | 2-4 | 0-2 | 0-2 | 12-131/2 | 41/2-6 | 61/2-7 | 41/2-5 | 2-21/2 | 0-1/2 | 2-4 | 0-2 | 111/2-12 | 2-21/2 | 8-10 | 4-6 | 6-8 | 2-4 | 6-8 | 4-6 | 8-10 | 4-6 | 2-4 | 0-2 | 8-10 | 4-6 | 6-8 | 8-9 | 6-8 | 6-8 | 0-2 | 8-10 | 4-6 | Depth (ft) |
| ND | ND | ND | 24 (A,LI) | ND | ND | ND | 46 (LI) | ND | N | ND | 10 (A,LI) | ND | ND | ND | ND | ND | ND | ND | ND | 280 (LI) | 80 (LI) | 110 (LI) | 99 (LI) | ND | 21 (LI) | ND | ND | ND | 11 (A) | ND | IND | | | ND | 18 (A, LI) | ND | 16 | ND | ND | ND | ND | 32 (LI) | ND | 35 (LJ) | DRO |
| 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | Action Level |

ND: Not Detected above Laboratory Reporting Limit.

LI: Results in the DRO range are primarily due to overlap from a heavy oil range product.

A: Sample does not display a fuel oil pattern. Sample contains several discreet peaks. Bold indicates DRO measured above Action Level.

Table 3
Summary of GRO and BETX Analysis
South Minneapolis Apartment Project
Minneapolis, MN
AET No. 03-02255.ii.u
(results in mg/kg)

| 5 | GP-12 | 71-7 | 0 هئ | GP-8 | GP-7 | GP-5 | GP-2 | GP-1 | Boring Number |
|-----|----------|------|-----------------|------|------|------|------|------|---------------|
| 2-4 | 111/2-12 | 6-8 | 4-6 | 6-8 | 0-2 | 6-8 | 6-8 | 4-6 | Depth (ft) |
| ND | ND | ND | ND | ND | ND | ND | ND | ND | GRO |
| ND | NA | NA | Xylene @ 0.099* | ND | NA | ND | ND | NA | BETX |

^{*:} The SRV and SLV for xylene are 110 and 45mg/kg, respectively.

NA: Not Analyzed

ND: Not Detected above Laboratory Reporting Limit.

Table 4
Summary of VOC Analysis
South Minneapolis Apartment Project
Minneapolis, MN
AET No. 03-02255.ii.u
(results in mg/kg)

| , | 8 | 7 | 1 | 1177-177 | HA_1 A | HA-1 | GP-12 | O1 -11 | CP_11 | 01-10 | CP_10 | ď. | CP 0 | OI -7 | Cp_7 | GP-6 | GP-4 | GP-3 | Boring Number |
|---|--------|-----|----------|----------|--------|--------|----------|--------|--------|--------|--------|--------|--------|--------|--------|------|------|------|------------------------|
| 3 | 0-2 | 0-2 | 12-131/2 | 61/2-7 | 41/2-5 | 0-1/2 | 111/2-12 | 8-10 | 4-6 | 6-8 | 2-4 | 6-8 | 4-6 | 8-10 | 4-6 | 4-6 | 6-8 | 6-8 | Depth (ft) |
| | ND (I) | ND | (1) | ND (1) | ND (1) | ND (1) | ND | ND (1) | ND | ND | ND | VOCs |
| | | | 0.97* | | | | | | | | | | | | | | | | Trichlorofluoromethane |

^{*: 0.49} mg/kg detected in trip blank; the SRV and SLV for trichlorofluoromethane are 67 and 22 mg/kg, respectively.

(1) VOC analysis included tentatively identifiable compounds (tics) ND: Not Detected above Laboratory Reporting Limit.

South Minneapolis Apartment Project Minneapolis, MN AET No. 03-02255.ii.u **Summary of Metals Analysis** (results in mg/kg) Table 5

| SLV | SRV | 8 | 7A | UF-12 | CD 12 | GF-11 | CD 11 | OI-10 | CB 10 | GP-9 | GP-8 | OI-0 | 7 d.J | GP-5 | GP-4 | GP-3 | GP-2 | GP-1 | Boring Number |
|------|------|-----|-----|----------|--------|-------|-------|-------|-------|------|------|------|-------|------|------|------|------|------|---------------|
| | | 0-2 | 0-2 | 111/2-12 | 2-21/2 | 8-10 | 4-6 | 6-8 | 2-4 | 4-6 | 6-8 | 8-10 | 4-6 | 6-8 | 6-8 | 6-8 | 6-8 | 4-6 | Depth (ft) |
| 15.1 | 10 | 6.4 | 13 | NA | 1.8 | 1.3 | 2.2 | 1.9 | 11 | NA | NA | 1.1 | 9.4 | NA | 2.8 | 1.6 | AN | 2.8 | Arsenic |
| 842 | 1200 | 100 | 130 | NA | 28 | 34 | 47 | 44 | 130 | NA | NA | 36_ | 140 | NA | 83 | 34 | NA | 49 | Barium |
| 4.4 | 35 | ND | ND | NA | ND | ND | ND | ND | ND | NA | NA | ND | 0.34 | NA | ND | ND | NA | MD | Cadmium |
| ≥18 | ≥71 | 15 | 19 | NA | 12 | 4.8 | 5.9 | 5.4 | 26 | NA | NA | 5.3 | 23 | NA | 11 | 5.2 | NA | 10 | Chromium |
| 10 | 62 | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | ND | NA | NA | NA | NA | NA | Cyanide |
| 525 | 400 | 28 | 15 | 11 | 6.6 | 2.4 | 3.3 | 3.0 | 14 | 24 | 2.5 | 2.6 | 11 | 6.1 | 5.6 | 2.4 | 2.5 | 9.8 | Lead |
| 1.6 | 0.7 | ND | ND | NA | ND | ND | ND | ND | ND | NA | NA | ND | ND | NA | ND | ND | NA | ND | Mercury |
| 1.5 | 170 | ND | ND | NA | ND | ND | ND | ND | ND | NA | NA | N | UN | NA | H | Ŋ | NA | ND | Selenium |
| 3.9 | 170 | ND | ND | NA | ND | ND | ND | ND | ND | NA | NA | N | ND | NA | A | N | NA | ND | Silver |

NA: Not Analyzed

ND: Not Detected above Laboratory Reporting Limit.

SRV: Residential Soil Reference Value SLV: Soil Leaching Value

Table 6
Summary of PCB Analysis
South Minneapolis Apartment Project
Minneapolis, MN
AET No. 03-02255.ii.u
(results in mg/kg)

| 000 | 7A | 71-11 | CD 11 | 01-10 | CB 10 | VO-10 | CD 64 | GP-6 | GP-4 | GP-3 | Boring Number |
|-----|-----|-------|-------|-------|-------|-------|-------|------|------|------|---------------|
| 0-2 | 0-2 | 8-10 | 4-6 | 6-8 | 2-4 | 4-6 | 0-2 | 4-6 | 6-8 | 6-8 | Depth (ft) |
| ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | РСВѕ |

ND: Not Detected above Laboratory Reporting Limit.

Summary of Nitrogen Analysis and pH Determinations South Minneapolis Apartment Project Minneapolis, MN AET No. 03-02255.ii.u (results in mg/kg) Table 7

Nitrogen Results

| A8 | 8 | 1 | GP-13 | GP-6 | Boring Number |
|------------|------------|------------|------------|------------|---------------|
| 0-2 | 0-2 | 12-131/2 | 0-2 | 4-6 | Depth (ft) |
| 134 mg/kg | 16 mg/kg | ND | 462 mg/kg | 544 mg/kg | TKN |
| 1000 mg/kg | 1000 mg/kg | 1000 mg/kg | 5000 mg/kg | 1000 mg/kg | CG |

Note: cleanup goal is 5000 mg/kg in upper 2' and 1000 mg/kg for soil below the 2' ND: Not Detected above Laboratory Reporting Limit.

CG: Cleanup Goal

pH Determinations

| | Lane of the second | |
|----------------------|--------------------|------|
| Boring Number | Depth (ft) | pH |
| GP-6 | 4-6 | 8.4 |
| U1 4D | 2-4 | 7.1 |
| GF-10 | 8-9 | 9.0 |
| 11 aD | 4-6 | 10.0 |
| GF-11 | 8-10 | 9.8 |
| 8 | 0-2 | 8.1 |
| | | |

Table 8
Summary of PAH Analysis
South Minneapolis Apartment Project
Minneapolis, MN
AET No. 03-02255.ii.u
(results in mg/kg)

| 8A | 7A | 6A | GP-12 | GP-1A | Boring Number |
|-----|-----|-----|--------|-------|---------------|
| 0-2 | 0-2 | 0-2 | 2-21/2 | 4-6 | Depth (ft) |
| ND | ND | ND | ND | ND | PAHs |

ND: Not Detected above Laboratory Reporting Limit.

| | TESTING, INC. | = AMERICAN | |
|--|----------------|-----------------------|---|
| | SCALE: | SUBJECT: | PROJECT: |
| (100 m) (100 m | None DRAWN BY: | PROPERTY Location Map | So. Minneapolis Apartment Project, Minneapolis, M |
| Bisch | Y: CHECKED BY: | | Project, Minneapolis, MN |
| | FIGHERE 1 | DATE Jan-05 | AET #03-02255 |

| 13th Ave S 15th Ave S | [8] | 14th Ave S | 2 svå del 2 svå del |
|--------------------------|----------------------------------|---------------------------|---|
| 17th Ave S | Cedar Au | 1016 | |
| No.Ca Pa | Hiawatha Golf Course | 144 St E 42nd 434 St E 4 | |
| Lake lokhomis Park | Hiawatha Golf Cours | | 」 「 子盤 25th Ave S。 |
| 29th Ave S | 28th Aue 9 | | |
| 21st Ave 5 - A | | = 30th Ave S any 1518 | |
| 34th Ave 3 夏 | | | 34th Ave S |
| 5 37th Ave 71 466 | 21 1 8 3 - 11 S.A. CARONTILLORG | 194 - T | 34th Ave S 35年 37年 37年 37年 37年 37年 37年 46th Ave S |
| th Ave S 42nd Ave | | Minneapolis, 43d St.E. | |
| 44th Ave 46th Ave |) (<u>8</u> | 4 4 7 | 46th Ave S |
| | | olis, |) |
| _(8) | , 适 | | |
| ompany 2 4 | Highland Pky 42 Ford Motor | N 5540 | a de la composição |
| - 4 g 3 | 육 (목) | MN 55406 Harland Ave | MapPoint Lincoln Ave Fairmount Ave Sangent Ave |
| A winia & | | Prior | |



ppendix A

Boring Logs



| : AZ | BORING COMPLETED: 12/21/04 | | | 0-12' Geoprobe | DEPTH: DRILLING | END OF BORING | 11 10 | 9 - SAND, medium to fine grained, brown (SP) | 8 7 - | 4 - FILL, sandy lean clay, brown, slight petroleum odor at about 4' to 6' (CL) [may be fine alluvium] | | 1 - FILL, mostly | DEPTH SURFACE E FEET | So. | AET IOR NO |
|----------|-------------------------------|----------------|---------------|-------------------------|--------------------------|---------------|-------|--|-------|---|---------------------------------|------------------|---|--|---------------------|
| Rig: 77 | 4 | | | 96 | DRILLING METHOD | RING | | ım to fine gra | | lean clay, bro 4' to 6' (CL) | bituminous, brown to dark brown | silty sand wi | SURFACE ELEVATION: Not Determined MATERIAL DESCRIPTION | Mpls. Apt. | 03-02255 |
| | | | | DATE | | | | ined, brow | | wn, slight [may be fii | brown | th gravel. | ot Detern DESCRIPTI | | |
| | | | | TIME | | | | /n (SP) | | petroleum ne alluvium | | some | nined ON | ct near I | |
| | | | None | SAMPLED DEPTH | WATE | | | | | | | | | £43rd | |
| | | | Taken | ED CASING DEPTH | WATER LEVEL MEASUREMENTS | | | COARSE ALLUVIUM | | FINE ALLUVIUM OR FILL | | FILL | GEOLOGY | Project near E43rd St & Snelling Ave.; Mpls, | |
| | 1 | | Refer To | CAVE-IN DEPTH | ASURE | | | | | | | | z | lling | - |
| | 4 | | | | MENTS | | Z | | 3 | 5 | F/M | | MC | Ave. | 3 TO 5 |
| | | | "MC" | DRILLING FLUID LEVEL | | | MC | | TATC. | Š | MC | | SAMPLE TYPE | Mpls, | OIN DINIANA BO DO I |
| | 1 | 1 | - | | | | 40 | | 0 | , , | 48 | | REC F | NN | |
| | | | Column | WATER | | | | | | | | | FIELD & | | B |
| Ŧ | TERMI | EXPLA | SHEE | THE / | NOTE | | | | | | | | FIELD & LABORATORY TESTS WC DEN LL PL PID | 9 | - 1 |
| THIS LOG | TERMINOLOGY ON | EXPLANATION OF | SHEETS FOR AN | THE ATTACHED | NOTE: REFER TO | | | | | | | | ATORY | 1011) | 1 of 1 |
| 7- | Y ON | N OF | AN | TED | ? TO | | 0.0 | 0.0 | 0.0 | 5.0 | 0.0 | 0.0 | TESTS | | |



| | - | | | | | | | | | CA: BT Rig: 77 | CC: PS |
|---|------------|-------|-------------------------|--------|------------------|--------------------------|------------------|-------------|---|--|---------------------|
| THIS LOG Y ON | | | | | | | | | | 2/22/05 | COMPLETED: |
| EXPLANATION OF | EX | | | | | | | | | | POBING |
| SHEETS FOR AN | Column | | "MC" | r To | Refer To | Taken | None | | | | |
| THE ATTACHED | 関 | L WAT | DRILLING FLUID LEVEL | H-IN | CAVE-IN DEPTH | CASING DEPTH | SAMPLED DEPTH | TIME SA | DATE | 6' Geoprobe | 0-6' |
| NOTE: REFER TO | Z | | rs | MEN | ASURE | WATER LEVEL MEASUREMENTS | VATER | | | H: DRILLING METHOD | DEPTH: |
| | | | | | | | | | | END OF BORING | 6 |
| 0.4 | | 24 | MC | Z | | COARSE ALLUVIUM | A C | ined, light | ND, fine gra | POORLY GRADED SAND, fine grained, light brown (SP) | |
| | | | | | l ÿ | WEATHERED SOIL | () < | | | LEAN CLAY, brown (CL) | 4 |
| 0.6 | | 48 | MC | F/M | - | TOPSOIL | | | (CL) | ORGANIC CLAY, black (CL) | |
| 0.4 | | | | | | FILL | H | en to 2½' | ∕el, tan, froz | FILL, mostly class 5 gravel, tan, frozen to 21/21 | |
| FIELD & LABORATORY TESTS WC DEN LL XRF PID (ppm) | FIELD & LA | REC F | SAMPLE TYPE | MC | z | GEOLOGY | | nined ON | EVATION: Not Determin MATERIAL DESCRIPTION | SURFACE ELEVATION: Not Determined MATERIAL DESCRIPTION | DEPTH IN FEET |
| | | | MN | olis, | neap | ct; Min | Proje | partment | apolis A | Sou | PROJECT: |
| (p. 1 of 1) | GP-1A | | LOG OF BORING NO. | 3 OF 1 | 1001 | | | | | 3 NO: 03-02255 | AET JOB NO: |



| сс: ВТ | BORL | | | 0 | DE | | 10 | 9 & | 7 | N 05 4 10 | 3 2 1 | | |
|----------|-------------------------------|----------------|-----------------|------------------|--------------------------|---|-----|--|-------|--|---|------|---|
| CA: | BORING COMPLETED: 12/21/04 | | | 0-12' Geoprobe | DEPTH: DRILLING METHOD | J | | SAND, medium to fine grained, brown (SP) | | FILL, lean clay, brown to dark brown (CL) [may be fine alluvium] | - FILL, mostly silty sand with gravel, some bituminous, brown to dark brown | | |
| | | | | DATE TIME | | | | rained, brown (SP) | | o dark brown (CL) [n | vith gravel, some k brown | | |
| | | | None | SAMPLED DEPTH | WATER | | | A.C | | | | Ξ | 1 |
| | | | Taken | CASING DEPTH | WATER LEVEL MEASUREMENTS | | | COARSE ALLUVIUM | | FINE ALLUVIUM OR FILL | | FILL | |
| | | | Refer To | CAVE-IN DEPTH | SUREME | | × | | F / L | n M | با | | Ī |
| | | | o "MC" | FLUID LEVEL | VTS | | MC | | | | MC | | |
| | | | Column | GEL WATER | | | 36 | | | 40 | 48 | | |
| THIS LOG | TERMINOLOGY ON | EXPLANATION OF | n SHEETS FOR AN | THE A | NOTE: REFER TO | | | | | | | | |
| | NO A | N OF | AN | ED | t TO | | 0.2 | 0.2 | 6.5 | 1.5 | 1.2 | 2 | |



| сс: ВТ | BORING COMPLETED: | | | 0-12' | DEPTH: | 12 | 10 – 11 – | 9 8 | 7 - | 5 1 | ا دی ح | 2] | DEPTH IN FEET | PROJECT: | AET JOB NO: |
|---------------|----------------------|----------------|---------------|-------------------------|--------------------------|---------------|--------------|--|-----|-----|---|----------------|---|---|-------------------|
| | STED: 12/21/04 | | | 2' Geoprobe | H: DRILLING METHOD | END OF BORING | | SAND, medium to fine grained, brown (SP) | | | FILL, mostly silty sand with gravel, some bituminous, brown to dark brown | | SURFACE ELEVATION: Not Determined MATERIAL DESCRIPTION | So. Mpls. Apt. | B NO: 03-02255 |
| | | | | DATE | | | | ined, browr | | | h gravel, so brown | | ot Determi | 11 | |
| | | | | TIME | | | | 1 (SP) | | | ome | | ined | t near H | |
| | | | None | SAMPLED DEPTH | WATE | | | | | | | | | 43rd | |
| | | | Taken | CASING DEPTH | WATER LEVEL MEASUREMENTS | | | COARSE ALLUVIUM | | | FILL | | GEOLOGY | Project near E43rd St & Snelling Ave.; Mpls, MN | |
| | | | Refer To | CAVE-IN DEPTH | SUREN | | | | | | | | z | ling / | FOG |
| | | | To | | ŒNTS | | Z | | Z | | | ⊼ X | MC S | ve.; | OF BC |
| | | | "MC" | DRILLING FLUID LEVEL | | | MC | | MC | | | M C | SAMPLE TYPE | Mpls, | LOG OF BORING NO. |
| | | | C | | | | 40 | | 40 | 5 | - | 4 8 | REC. | | |
| | | | Column | WATER LEVEL | | | | | | | | | WC 1 | | GP-3 |
| | TER | EXF | | | NO | | | | | | | | DEN DEN | | -3 (p. |
| THIS LOG | MINOI | LANA | EETS ! | E ATT | TE: R | | | | | | | | ORATO | | . 1 of 1) |
| POG | TERMINOLOGY ON | EXPLANATION OF | SHEETS FOR AN | THE ATTACHED | NOTE: REFER TO | | | | | | | | DEN LL PL (ppm) | | |
| | 8 | 유 | Z | <u> </u> | 0 | | 2.0 | 4.0 | 4.5 | 2.5 | 0.2 | 0.3 | ESTS PID (ppm) | | |



| | BORING COMPLETED: 12/21/04 | | | 0-12' Geoprobe DATE | DEPTH: DRILLING METHOD | END OF BORING | 10 11 110 | | 6 – 7 – | | FILL, sandy lean clay, gravel, black | 1 - FILL, moslty silty sand with gravel, light brown | DEPTH SURFACE ELEVATION: Not Determined N MATERIAL DESCRIPTION | PROBCT: So. Mpls. Apt. Proje | AET JOB NO: 03-02255 |
|----------|-------------------------------|----------------|---------------|-------------------------|--------------------------|---------------|---|--------|----------|------|--------------------------------------|--|--|---|----------------------|
| | | | | TIME S/ | 1 | = | MI (OL) | (CD) | O CLOWIT | | | light brown | mined ION | Project near E43rd St & Snelling Ave.; Mpls, MN | |
| | | | None | SAMPLED DEPTH | NATE | | | | | | | | | 3rd | |
| | | - | Taken | CASING DEPTH | WATER LEVEL MEASUREMENTS | | ALLUVIUM | COARCH | | FILL | | | GEOLOGY | St & Snel | |
| | | | Refer To | CAVE-IN DEPTH | SURE | | | | | | | | z | ling | LOC |
| | | | r To | | MENT | | X | | Z | | F/M | 1 | MC | Ave. | OF B |
| | | | "MC" | DRILLING FLUID LEVEL | S | | MC | | MC | | MC | | SAMPLE TYPE | ; Mpls, | LOG OF BORING NO. |
| | - | | | | | | 40 | | 42 | | 48 | | REC. | | i |
| | | | Column | WATER LEVEL | | | | | | | | | WC | | GP-4 |
| | | Ex | _ | | Z. | | | | | | | | DEN | | |
| THI | RMIN | PLAN | HEET | HE AT | NOTE: I | | | | | | | | BORA7 | | (p. 1 |
| THIS LOG | TERMINOLOGY ON | EXPLANATION OF | SHEETS FOR AN | THE ATTACHED | REFER TO | | | | | | | | & LABORATORY TESTS DEN LL PL (ppm) | | 1 of 1) |
| | NO A | √ OF | AN | ED | TO | | 15 | 1.0 | 3.0 | 1.5 | 5.0 | 1.5 | PID (ppm) | | |



| i: 1 | BORING COMPLETED: 12/21/04 | | | 0-12' Geoprobe | DEPTH: DRILLING METHOD | END OF BORING | 5 11 | 10 – | 8 | 7 | y 2 | brown to dark brown | 2 — FIII. silty sand gravel som | 1 | DEPTH IN FEET MATERIAL DESCRIPTION |] ::: | AET JOB NO: 03-02255 |
|----------|-------------------------------|----------------|---------------|-------------------------|--------------------------|---------------|------|-----------------|---|-----|----------|---|---------------------------------|-----|-------------------------------------|---|----------------------|
| | | | | DATE TIME S. | | | | ied, brown (Sr) | (97) | | | , | e sandy lean clay | | t Determined ESCRIPTION | Project near E43rd St & Snelling Ave.; Mpls, MN | ļ |
| | | | None | SAMPLED DEPTH | WATER | | | À | | | | | | | | f3rd S | |
| | | | Taken | CASING DEPTH | WATER LEVEL MEASUREMENTS | | | ALLUVIUM | S B C C C C C C C C C C C C C C C C C C | | | | FII J. | | GEOLOGY | st & Snel | 1 |
| | | | Refer To | CAVE-IN DEPTH | SUREN | | | | | ' | | | | | z | ling / | LOG |
| | | | To | | ENTS | | | Z | | | ≼ | The same | F/M | | MC . | ve.; | OF BO |
| | | | "MC" | DRILLING FLUID LEVEL | | | | MC | | | <u> </u> | | MC | 5 | SAMPLE TYPE | Mpls, | LOG OF BORING NO. |
| | | | C | | | | | 48 | | | 40 | | 4 | | REC . | | |
| | | | Column | WATER LEVEL | | | | | | | | | | | WC I | | GP-5 |
| ! | TER | — EXP | _ | | NO. | | | | | | | | | | DEN DEN | | 5 (p. |
| THIS LOG | MINOL | LANA | EETS F | E ATT, | TE: RE | | | | | | | | | | LL I | | . 1 of 1) |
| 90, | TERMINOLOGY ON | EXPLANATION OF | SHEETS FOR AN | THE ATTACHED | NOTE: REFER TO | | 1.5 | | 1.5 | 6.0 | | us is | 2.0 | 1.5 | DEN LL PL (ppm) | | |



| 1 1 | BORING COMPLETED: 12/22/04 | | | 0-12' Geoprobe | DEPTH: DRILLING METHOD | END OF BORING | 11 – | 8 - SAND, medium to fine grained, brown (SP) | 7 – | 4 - FILL, lean clay, brown to dark brown (CL) [may be fine alluvium] | 2 – CAIN DIOWII | 1 - FILL, mostly silty sand with gravel, brown to | DEPTH SURFACE ELEVATION: Not Determined IN MATERIAL DESCRIPTION | PROJECT: So. Mpls. Apt. | AET JOB NO: 03-02255 |
|----------|-------------------------------|----------------|---------------|-------------------------|--------------------------|---------------|------|--|------|--|-----------------|---|---|----------------------------|----------------------|
| | | | | DATE TIME | | | | ained, brown (SP) | | dark brown (CL) | | ith gravel, brown | EVATION: Not Determined MATERIAL DESCRIPTION | t. Project near E43rd St & | |
| | | | None | E SAMPLED DEPTH | WATI | | | _ | | | | to | | ar E43rd | |
| | | | e Taken | ED CASING DEPTH | WATER LEVEL MEASUREMENTS | | | COARSE ALLUVIUM | | FINE ALLUVIUM OR FILL | | FILL | GEOLOGY | St & Sne | |
| | | | Refer To | CAVE-IN DEPTH | ASUREM | | | | | | <u> </u> | | Z | Snelling Ave.; Mpls, MN | LOGC |
| | | | Го | | ENTS | | X | | | | F/M | | MC S | ve., |)F BO |
| | | | "MC" | DRILLING FLUID LEVEL | | | MC | | 17.0 | Š. | MC | | SAMPLE TYPE | Mpls, | LOG OF BORING NO. |
| | | | | | | | 40 | | ō | 48 | 48 | | N.C | M | 1 |
| | | | Column | WATER LEVEL | | | | | | | | | WC | | $ \Omega $ |
| | | Įπj | | | 7 | | | | | | | | DEN DEN | | P-6 |
| HT | RMIN | XPLAì | SHEE1 | THE A | OTE: | | | | | k | | | DEN LL PL | | (p. 1 |
| THIS LOG | TERMINOLOGY ON | EXPLANATION OF | SHEETS FOR AN | THE ATTACHED | NOTE: REFER TO | | | | | | | | TORY | | 1 of 1) |
| | NO A! | ŇOF | AN | HED | R TO | | 0.0 | 0.0 | 1.0 | 1.0 | 0.5 | 4.0 | PID (ppm) | | |



| | | | | | | | | ; | | | ; | |
|--|--|------------------|------------------------------|--------------------------|-------------------|--------------------------------|------------|----------------|--------|----------|------------------|-----------------|
| PROJECT: South Minneapolis | LOG OF 1 Apolis Apartment Project; Minneapolis, | t Proje | et; Minr | LOG C l eapoli | of Borin S, MN | LOG OF BORING NO. apolis, MIN | 1 | GP-6A | | (p. 1 o | 0f L) | , <u>,</u> , |
| SURFACE EL | EVATION: Not Determined MATERIAL DESCRIPTION | | GEOLOGY | Z | | PE | REC IN. | FIELD & | & LABO | ORATOI | DEN LL XRF (ppm) | TESTS PID (ppm) |
| FILL, mostly silty sand and gravel, black and brown, frozen to 2½' | d gravel, black and | | FILL | দ | F/M | MC | 48 | | | | 0 | 0.5 |
| 3 - LEAN CLAY, brown (CL) | | TOV | WEATHERED SOIL OR FILL | | | | | | | | 0 | 0.4 |
| END OF BORING | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| DEPTH: DRILLING METHOD | | WATER | WATER LEVEL MEASUREMENTS | SUREME | STN | | | | TON | E: RE | NOTE: REFER TO | U |
| 0-4' Geoprobe | DATE TIME | SAMPLED DEPTH | CASING DEPTH | CAVE-IN DEPTH | | DRILLING FLUID LEVEL | | WATER LEVEL | THE |) ATTA | THE ATTACHED | |
| | | None | | Refer To | | "MC" | | Column | SHE | ETS F | SHEETS FOR AN | |
| DOBINO | | | | | | | | | EXPL | ANAT | EXPLANATION OF | [I,] |
| TED: 2/22/05 | | | | | | | | | TERM | THIS LOG | THIS LOG | Ž |
| CC: PS CA: BT Rig: 77 | | | | | | | = | | | | | L |



| CC: BT CA: AZ Rig: 77 | BORING 12/22/04 | | | 0-12' Geoprobe | DEPTH: DRILLING METHOD | END OF BORING | 10 – | 8 – SAND, medium to fine grained, brown (SP) | 7 — | 4 | FILL, silty sand, gravel, dark brown to brown, slight petroleum odor | 1 - | DEPTH SURFACE ELEVATION: Not Determined MATERIAL DESCRIPTION | So. | AET IOB NO: 03-02255 |
|-----------------------|-----------------|----------------|---------------|-------------------------|--------------------------|---------------|------|--|-------|---------------------|--|-----|--|---------------------------|----------------------|
| | | | | DATE TIME | | | | iined, brown (SP) | | dark brown (CL) [ma | ark brown to brown, | | EVATION: Not Determined MATERIAL DESCRIPTION | . Project near E43rd St & | |
| | | | None | SAMPLED DEPTH | WATER I | | | CC | | | FILL | | 0 | E43rd St | |
| | | | Taken | CASING DEPTH | WATER LEVEL MEASUREMENTS | | | COARSE | CHILL | FINE | T | | GEOLOGY | & Snell | |
| | | | Refer To | CAVE-IN DEPTH | SUREMEN | | Z | | Z | | F/M | | N MC | ing Ave | 1 40 40 1 |
| | | | "MC" | DRILLING FLUID LEVEL | TS | | MC | | MC | S = 1- | MC | | SAMPLE TYPE | Snelling Ave.; Mpls, | LOG OF BORING NO |
| | | | Column | G WATER LEVEL | | | 30 | | 48 | | 48 | | REC FIELD WC | MN | GP-7 |
| THIS LOG | TERMINO | 1 | - | THE A | NOTE: R | | 1 | | | | - | | ELD & LABORATORY TESTS VC DEN LL PL PID (ppm) | | (p |
| LOG | TERMINOLOGY ON | EXPLANATION OF | SHEETS FOR AN | [ACHED | REFER TO | | 2.0 | 1.6 | 2.0 | 2.0 | 7.0 | 5.9 | ORY TESTS PL PID (ppm) | | of 1) |



| TUTO | | | - | | | | | | | | CA: AZ Rig: 77 | cc: BT |
|--------------------------|---------|----------------|-----|-------------------------|------------------|-------|--------------------------|------------------|---|--------------|--------------------------------------|-------------|
| THE LOGY ON | I EKIMI | | - | | | | | | | 4 | ETED: 12/22/04 | COMPLETED: |
| EXPLANATION OF | EXPL, | | _ | | | | | | | | | |
| SHEETS FOR AN | SHEE | Column | | "MC" | Refer To | | Taken | None | | | | |
| THE ATTACHED | THE. | WATER LEVEL | | DRILLING FLUID LEVEL | CAVE-IN DEPTH | | CASING DEPTH | SAMPLED DEPTH | TIME | DATE | [2' Geoprobe | 0-12' |
| NOTE: REFER TO | NOTE | | | TS | EMEN. | ASUR | WATER LEVEL MEASUREMENTS | WATER | | | H: DRILLING METHOD | DEPTH: |
| | | | | | | | | | | | ELOCATION OF POSITION | |
| | | | | | | 1 | | | | | END OF RORING | 12 - |
| 1.0 | | | £ | MIC | <u> </u> | | COARSE ALLUVIUM | A. O | | rown (SP) | SAND, medium grained, brown (SP) | |
| | | | 3 | | ζ | | | | | | | 9 |
| 1.0 | | | | | | | | | | 1 | dark brown, little silt | |
| 2.0 | | | 40 | MC | Z | | | | rown to | e grained, b | FILL, sand, medium to fin | 6 - |
| 1.0 | | | | | | | FILL | <u> </u> | | | | 5 |
| | | | | | | | | | | | | 4 — |
| 0.5 | | | | * | | | | | | lean clay | FILL, silty sand and sandy lean clay | ω 1 |
| | | | 48 | MC | Z | | | | | | | 2 — |
| 0.5 | | | | | | | | | | lack | FILL, silty sand, gravel, black | - |
| PL (ppm) | F E | WC DEN | Ę | HAYT | _ | - | | | Ž | DESCRIPTIO | MATERIAL DESCRIPTION | + |
| FIELD & LABORATORY TESTS | LABOR | | REC | SAMPLE | K S | | GEOLOGY | | ined | Not Determ | SURFACE ELEVATION: Not Determined | DEPTH |
| | | | M | .; Mpls, | Ave | lling | t & Sne | 43rd S | Project near E43rd St & Snelling Ave.; Mpls, MN | 1 | So. Mpls. Apt. | PROJECT: |
| 1 of 1) | þ. | GP-8 | 1 | LOG OF BORING NO. | G OF 1 | T(C | | | | | B NO: 03-02255 | AET JOB NO: |
| | | | | | | | | | | | | |



| cc: BT | BORING COMPLETED: | | | 0 | DEPTH: | c | o \ | 6 | U 4 10 | , 2 | 1 | FEET | DEPTH | PROJECT: | AET JO |
|-----------------------|----------------------|----------------|---------------|-------------------------|--------------------------|--------------------------------|---|-----|---|-----|------------|----------------------|--------------------------|---|----------------------|
| CA: AZ Rig: 77 | ETED: 12/22/04 | | | 0-8' Geoprobe | TH: DRILLING METHOD | END OF BORING OBSTRUCTED AT 8' | SAND, medium to fine grained, brown [maybe fill] (SP) | | FILL, mostly silty sand, gravel, sandy lean clay, brown to dark brown, some concrete debris, petroleum odor at 4' to 6' | | O CONCRETE | MATERIAL I | SIRFACE | CT: So. Mpls. Apt. | AET JOB NO: 03-02255 |
| | | | | DATE TIME S | | | ined, brown [maybe | | avel, sandy lean clay, e concrete debris, | | | MATERIAL DESCRIPTION | ot Determined | . Project near E43rd St & Snelling Ave.; Mpls, MN | |
| | | | None | SAMPLED DEPTH | WATE | | | | | | | | | 43rd | |
| | | | Taken | CASING DEPTH | WATER LEVEL MEASUREMENTS | OKTILL | COARSE ALLUVIUM | | FILL | | | OBOLOG1 | GEOI OGV | St & Snel | |
| | | | Refer To | CAVE-IN DEPTH | SUREN | | | | | | | z | | ling / | LOG |
| | | | To | | ENTS | | | X | | ਸ | | NO NO | | ve. | OF BO |
| | | | "MC" | DRILLING FLUID LEVEL | | | | MC | •••••••••••••••••••••••••••••••••••••• | MC | | TYPE | A MOT E | Mpls, | LOG OF BORING NO. |
| | | | C | | | | | 40 | | 36 | | Z | | N | |
| | | | Column | WATER LEVEL | | | | | | | | WC D | FIELD & | | GP-9 |
| THIS LOG | TERMINOLOGY ON | EXPLANATION OF | SHEETS FOR AN | THE ATTACHED | NOTE: REFER TO | | | | | | | DEN LL PL | FIELD & LABORATORY TESTS | | 9 (p. 1 of 1) |
| | NO A | N OF | AN | ED — | ₹TO | | | 1.5 | 24.5 | 0.5 | 0.5 | (mdd) | TESTS | | |



| • • | BORING 12/22/04 | | | 0-12' Geoprobe | DEPTH: DRILLING METHOD | END OF BORING | ; II . | 9 - SAND, medium to fine grained, brown (SP) | | 7 - | 5 - | 4 | 2 - FILL, sandy lean clay, brown to dark brown | | FEET SURFACE ELEVATION: NOT Determined N MATERIAL DESCRIPTION S'' CONCEPTE | T Ĝ | O. |
|----------|-----------------|----------------|---------------|-------------------------|--------------------------|---------------|--------|--|--------------|-----|----------|---|--|-----|---|---|-------------------|
| | | | | DATE | | | | amed, brown (s | | | | | own to dark bro | | EVATION: NOT DETERMINE MATERIAL DESCRIPTION | Project near E43rd St & Snelling Ave.; Mpls, MN | - 1 1 |
| | | | | TIME S/ | | | | SP) | j | | | | nwo | | ĕ | ear £4 | |
| | | | None | SAMPLED DEPTH | VATER | | | A C |) | | | | ਸ | | | 3rd S | |
| | | | Taken | CASING DEPTH | WATER LEVEL MEASUREMENTS | | | ALLUVIUM | DA PER | | | | FILL | | GEOLOGY | t & Snell | |
| | | | Refer To | CAVE-IN DEPTH | SUREM | | | | | | | | | | z | ling A | LOG |
| | - | | To | | ENTS | | | X | | Z | | | Z | | MC S. | ve.; | OF BOI |
| | | | "MC" | DRILLING FLUID LEVEL | | | | MC | | Z | Š | | MC | | SAMPLE TYPE | Mpls, | LOG OF BORING NO. |
| | - | | Ω | | | | | 40 | | 040 | <u>`</u> | | 40 | | P.R.C | | |
| | | | Column | WATER LEVEL | | | | | | | | | | | WC DEN | ener D & | GP-10 |
| THI | TERMINOLOGY ON | EXPLANATION OF | SHEET | THE ATTACHED | NOTE: REFER TO | | | | | | | | | - O | WC DEN LL PL (ppm) | A BOB A | |
| THIS LOG | OLOGY | JATION | SHEETS FOR AN | ГТАСН | REFER | | | | | | | | | | J. J. J. | T V d O | (p. 1 of 1) |
| | NO | I OF | AN | ED | TO | | 0.5 | | 0.5 | 1.0 | 1.0 | | 1.0 | 0.5 | PID (ppm) | Terre | |



| APT JOB NO. | TERMINOLOGY ON THIS LOG | | | | | | | | | 2/04 Rig: 77 | BORING COMPLETED: 12/22/04 CC: BT CA: AZ Rig | BORING COMPLE |
|--|----------------------------|----------------|-----|----------|-------|-------|------------|-------|----------------|---------------------------------------|--|---------------------|
| DIR NO. 03-02255 LIGG OF BORING NO | EXPLANATIO | Column | = | | er To | Ref | - | None | | | | |
| DE NO: 03-02255 SOL Mpls. Apt. Project near E43rd St & Snelling Ave.; Mpls. MIN SURFACE BLEVATION: Not Determined MATERIAL DESCRIPTION 14" CONCRETE 14" CONCRETE Clay, mostly sand, medium grained, sandy lean Clay, mostly sand, medium grained, brown (8P) SAND, medium to fine grained, brown (8P) END OF BORING THE DRILLING METHOD WATER LEVEL MEASUREMENTS TOG OF BORING NO. 30 MM MC 30 MM MC 30 30 30 30 30 30 30 30 30 30 | THE ATTACH | WATER LEVEL | NG | | VE-IN | | | AMPLE | 1 | | | 0 |
| SOR NO: SOL Mpls. Apt. Project near E43rd St & Snelling Ave.; Mpls. MN SURFACE BLEVATION: Not Determined MATERIAL DESCRIPTION 14" CONCRETE FILL, mostly sand, medium grained, sandy lean clay SAND, medium to fine grained, brown (8P) SAND, medium to fine grained, brown (8P) END OF BORING 100 SOL MPLS REC NAMPLE R | NOTE: REFER | | | TS | EMEN | ASUR | R LEVEL ME | WATE | | ING METHOD | | DEP |
| DB NO: 03-02255 CCT: So. Mpls. Apt. Project near E43rd St & Snelling Ave.; Mpls, MN SURFACE ELEVATION: Not Determined MATERIAL DESCRIPTION 14" CONCRETE FILL, mostly sand, medium grained, sandy lean clay SAND, medium to fine grained, brown (SP) SAND, medium to fine grained, brown (SP) END OF BORING 100 OF BORING DO OF BORING SAMPLE REC MAC SAMPLE REC MAC SOLOGY N M MC 30 FILL GEOLOGY N MC SAMPLE REC MAC SOLOGY N M MC 30 M MC 30 COARSE MALLUVIUM M MC 36 | | 4 | | | | W: | | | | | | |
| DB NO: 03-02255 So. Mpls. Apt. Project near E43rd St & Snelling Ave.; Mpls. MN SURFACE ELEVATION: Not Determined MATERIAL DESCRIPTION 14" CONCRETE FILL, mostly sand, medium grained, sandy lean clay SAND, medium to fine grained, brown (SP) SAND, medium to fine grained, brown (SP) LOG OF BORING NO. DEGLE SAND, MC SAMPLE REC. MM MC SAMPLE REC. MM MC 30 FILL MM MC 30 ALLUVIUM MM MC 36 | | | | | | | | 6 | | ORING | END OF B | 12 - |
| OB NO: 03-02255 So. Mpls. Apt. Project near E43rd St & Snelling Ave.; Mpls, MN SURFACE ELEVATION: Not Determined MATERIAL DESCRIPTION 14" CONCRETE FILL, mostly sand, medium grained, sandy lean clay FILL MM MC 30 FILL MM MC 30 | | | 36 | MC | × | | ALLUVIUM | | own (Sr) | dium to ime grained, o | SAND, me | 10 – 11 – |
| OB NO: 03-02255 CT: So. Mpls. Apt. Project near E43rd St & Snelling Ave.; Mpls, MN SURFACE ELEVATION: Not Determined MATERIAL DESCRIPTION 14" CONCRETE FILL, mostly sand, medium grained, sandy lean FILL AM MC 30 M MC 30 | | | | | | | | | | | | 9 80 |
| OB NO: 03-02255 CT: So. Mpls. Apt. Project near E43rd St & Snelling Ave.; Mpls, MN SURFACE ELEVATION: Not Determined MATERIAL DESCRIPTION 14" CONCRETE FILL, mostly sand, medium grained, sandy lean clay LOG OF BORING NO. REC. Mpls. Apt. Project near E43rd St & Snelling Ave.; Mpls, MN SAMPLE REC. NO. M. MC SAMPLE REC. NO. M. MC 30 | | | 30 | MC | Z | | | | | | | |
| OB NO: 03-02255 CT: So. Mpls. Apt. Project near E43rd St & Snelling Ave.; Mpls, MN SURFACE ELEVATION: Not Determined MATERIAL DESCRIPTION 14" CONCRETE FILL, mostly sand, medium grained, sandy lean FILL LOG OF BORING NO. SAMPLE REC IN. M MC 30 | | | | | | | | | | | clay | 5 4 |
| OB NO: 03-02255 CT: So. Mpls. Apt. Project near E43rd St & Snelling Ave.; Mpls, MN SURFACE ELEVATION: Not Determined MATERIAL DESCRIPTION 14" CONCRETE MMC 30 | | | | | | | FILL | | d, sandy lean | lly sand, medium grain | FILL, most | ω |
| OB NO: 03-02255 CT: So. Mpls. Apt. Project near E43rd St & Snelling Ave.; Mpls, MN SURFACE ELEVATION: Not Determined MATERIAL DESCRIPTION 14" CONCRETE LOG OF BORING NO. LOG OF BORING NO. MPLS, MPLS REC. 14" CONCRETE | | | 30 | MC | Z | | | | | | | 2 - |
| OB NO: 03-02255 So. Mpls. Apt. Project near E43rd St & Snelling Ave.; Mpls, MN SURFACE ELEVATION: Not Determined MATERIAL DESCRIPTION MC SAMPLE REC IN. | | | | | | | | | | RETE | 14" CONC | _ |
| So. Mpls. Apt. Project near E43rd St & Snelling Ave.; Mpls, MN | EN LL PL | | REC | | | | GEOLOGY | | rmined TION | ELEVATION: Not Det MATERIAL DESCRI | | DEPTH IN FEET |
| 03-02255 LOG OF BORING NO. GP-11 (p. 1 | | | , M | e.; Mpls | Ave | lling | St & Sne | 43rd | | Mpls. Apt. | i | PROJE |
| | (p. 1 | GP-1 | Ō | BORING N |)G OF | LC | | | | 03-02255 | OB NO: | AET J |



| CC: PS CA | RORING | | 0-12' | DEPTH: | | DEPTH IN FEET | AET JOB NO: PROJECT: | 1 |
|---------------------------------------|----------------|---------------|-------------------------|--------------------------|---|--|--------------------------|-------|
| TED: 2/22/05 CA: BT Rig: 77 | | | 2' Geoprobe | H: DRILLING METHOD | FILL, mostly silty sand with gravel, some dark organic at about 2' to 2½', possible cinders, brown and black, frozen to 2½' LEAN CLAY, brown (CL) END OF BORING | SURFACE ELEVATION: Not Determined MATERIAL DESCRIPTION | T: South Minneapolis | |
| | | | DATE TIME | | th gravel, some dar possible cinders, 2½ | EVATION: Not Determined MATERIAL DESCRIPTION | polis Apartment Project; | |
| | | None | SAMPLED DEPTH | WATE | | | ent Pro | |
| | | e Taken | ED CASING H DEPTH | WATER LEVEL MEASUREMENTS | FILL | GEOLOGY | ject; Min | |
| | | Refer To | CAVE-IN DEPTH | ASUREM | | z | Minneapolis, | |
| | - | To | | ENTS | M M F/M | MC | is, N | į |
| | | "MC" | DRILLING FLUID LEVEL | | MC MC | SAMPLE TYPE | apolis, MN | |
| | | | | | 36 48 48 | REC IN. | | |
| | | Column | WATER LEVEL | | | FIELD & | GP-12 | 3 |
| TEALWIN | EXPLANATION OF | SHEE | HE / | NOTE: | | & LABORATORY TESTS DEN LL XRF PID | | 7 |
| THIS LOG | NATIC | SHEETS FOR AN | THE ATTACHED | NOTE: REFER TO | | ATORY XRF | | 1 , f |
| 7 | ON OF | AN | HED | R TO | 0.4 0.5 0.5 0.3 | TESTS F PID F (npm) | | • |



| CC: PS | BORING COMPLETED: | | 0-4' | DEPTH: | | | 2 — | | DEPTH IN FEET | PROJECT: | AET JOB NO: |
|-----------------------|----------------------|----------------|-------------------------|--------------------------|---------------|-----|--|------|--|--|-------------------|
| CA: BT Rig: 77 | ED: 2/22/05 | | Geoprobe | : DRILLING METHOD | END OF BORING | | FILL, mostly silty sand with gravel and some sandy clay, black | | SURFACE ELEVATION: Not Determined MATERIAL DESCRIPTION | South Minneapolis Apartment Project; Minneapolis, MN | 1 |
| | | | DATE TIME | | | | th gravel and som | | EVATION: Not Determined MATERIAL DESCRIPTION | polis Apartm | |
| | | None | S | WATER | | | (+) | | | nent Proj | |
| | | Taken | 1 | WATER LEVEL MEASUREMENTS | | | FILL | | GEOLOGY | ect; Minr | |
| | | Refer To | CAVE-IN DEPTH | SUREME | | | দা | | Z | eapoli | LOGO |
| | \vdash | | | STINE | | | F/M | رجور | MC S, | is, M | OF BOR |
| | | "MC" | DRILLING FLUID LEVEL | | | | MC | | SAMPLE TYPE | | LOG OF BORING NO. |
| - | | | | | | | 48 | | REC IN. | | Ī |
| | | Column | WATER LEVEL | | | | | | WC | | GP. |
| - | LI II II | _ | | - | | | | | DEN DEN | | P-13 (|
| THIS LOG | IONIM | LANA | EETS | TE: R | | | | | 3ORAT LL | | (p. 1 |
| FOG | TERMINOLOGY ON | EXPLANATION OF | THE ATTACHED | NOTE: REFER TO | | | | | FIELD & LABORATORY TESTS WC DEN LL XRF PID (ppm) | | 1 of 1) |
| | 9 9 | 아 아 | z Ü | TO | | 0.4 | | 0.5 | PID (ppm) | | |



| 1 - | PEET | ROJEC | AET JOB NO: |
|--|--|--|--|
| FILL, mostly silty sand widark brown | SURFACE ELEVATION: NATERIAL I | So. Mpls. Apt | |
| th gravel, brown to | JESCRIPTION | . Project near | - 1 |
| —————————————————————————————————————— | | E43rd S | |
| TIL | GEOLOGY | St & Snel | |
| | Z | ling A | LOG (|
| M HA | SAMPLE TYPE | ve.; Mpls, | LOG OF BORING NO. |
| | | MN | H/ |
| | DEN | | 1 |
| | BORATO | | (p. 1 of 1) |
| 0.0 | ORY TEST PL PII | |)f 1) |
| | FILL, mostly silty sand with gravel, brown to Gravel, brown FILL M HA | SURFACE ELEVATION: Not Determined MATERIAL DESCRIPTION FILL, mostly silty sand with gravel, brown to dark brown GEOLOGY N MC SAMPLE REC TYPE IN. WC DEN LL PL (dark brown) HA | SURFACE ELEVATION: Not Determined MATERIAL DESCRIPTION FILL, mostly silty sand with gravel, brown to dark brown Material Description FILL M FILL M FILL M FILL M HA HA HA HA HA WITH MILL MILL M HA HA HA HA HA HA HA HA HA H |



| CC: AZ | BORING COMPLETED: | | 0-7' | DEPTH: | | 7 | S 4 3 | 2 | DEPTH IN FEET | AET JOB NO: PROJECT: |
|-------------|----------------------|----------------|-------------------------|--------------------|---------------|--|---|--|---|---|
| CA: BT Rig: | TED: 2/22/05 | | 7' Hand Auger | H: DRILLING METHOD | END OF BORING | POORLY GRADED SAND WITH GRAVEL, brown (SP) | POORLY GRADED SAND WITH GRAVEL, brown (SP) [may be fill] | NOT SAMPLED REFER TO LOG OF BORING NO. HA-1 | SURFACE ELEVATION: Not Determined MATERIAL DESCRIPTION | , ź |
| | | | DATE TIME | | | ND WITH GRAVEI | ND WITH GRAVEI | TO LOG OF | EVATION: Not Determined MATERIAL DESCRIPTION | 03-02255 South Minneapolis Apartment Project; |
| | | None | SAMPLED | WATER | | | | | | ent Proje |
| | | Taken | | | | COARSE ALLUVIUM | COARSE ALLUVIUM OR FILL | | GEOLOGY | |
| | | Refer To | CAVE-IN DEPTH | SUREMI | | | | | z | LOG OF Minneapolis, |
| - | | - 0 | | STN | | | | | MC S | of Bo |
| | | "MC" | DRILLING FLUID LEVEL | | _ # | HA | НА | | SAMPLE TYPE | LOG OF BORING NO. |
| | | Column | | | | | | | REC FIEL WC | |
| _ | | - | 界 | 1_ | | | | | DEN DEN | A-1A |
| THIS LOG | TERMINOLOGY ON | EXPLANATION OF | THE ATTACHED | NOTE: REFER TO | | | | | BORAT | (p. |
|) OG | OGY ON | TON OF | ACHED | FER TO | | 0.5 | 3.2 22.3 | | ORY TESTS XRF PID (ppm) | 1 of 1) |



| Proposed South Minneapolis Apartment Project; Min Proposed South Minneapolis Apartment Project; Min Minneapolis Apartment Project; Minneapolis Apartment Project All | | | | | | | | | | COMPLETED: 1/4/05 CC: DS CA: BL Rig: 33C | CC: |
|--|----------------|----|-----------------------|--------|------|------------------------------|------------------------------|-------------------------|--------------------------------|---|------------|
| SCIT: Proposed South Minneapolis A SURFACE ELEVATION: MATERIAL DESCRIPTION 4.5" Bituminous pavement FILL, mostly sandy lean clay, a little gravel, dark brown to brown, frozen to 1.5' SILTY SAND, fine grained, brown, moist, loose (SM) LEAN CLAY WITH SAND, brown, firm, a lense of fat clay (CL) SAND WITH SILT, fine grained, brown, moist, loose (SP-SM) SAND, a little gravel, fine to medium grained, light brown, moist, needium dense (SP) SAND WITH GRAVEL, fine to medium dense (SP) SAND WITH GRAVEL, medium dense (SP) SAND WITH GRAVEL, medium dense (SP) SAND WITH GRAVEL, medium dense (SP) CLAYEY SAND, a little gravel, brown, stiff (SC) CLAYEY SAND, a little gravel, gray, stiff (SC) END OF BORING THE DRILLING METHOD DATE TIME S 11:50 | EXPLANATION OF | | | | | | | | | NO BACT | |
| OBNO. OB-02255 CITY Proposed South Minneapolis Apartment Project; Minneapolis, NAPELAGE ELEVATION: 1004 MATERIAL DISCRIPTION ASTRUMACE ELEVATION: 1004 MATERIAL DISCRIPTION MATERIAL DISCRIPT | one | 7. | | .4 | 30 | 29.5 | 31.0 | 11:50 | 1/4/05 | | |
| OBNO: 03-02255 Proposed South Minneapolis Apartment Project: Minneapolis Minnea | ATER | | DRILLING FLUID LEV | | CAV | | SAMPLE DEPTH | | DATE | က | |
| OBNO: 03-02255 | | | S | MENT | SURE | LEVEL MEA | WATER | | | | |
| OB NO: 03-02255 CET: Proposed South Minneapolis Apartment Project; Minneapolis, JUN COF BORING NO. 100.4 SURFACE BLEVATION 100.4 MATERIAL DESCRIPTION MATERIAL DESCRIPTION A4.5 Bitminus pavement form, mostly sandy lean clay, a little gravel, dark brown to brown, frozen to 1.5; Minneapolis, JUN SAND, a little gravel, fine to medium dense (SP) SLITY SAND, fine grained, brown, moist, medium dense (SP) SAND WITH SILT, fine grained, brown, moist, medium dense (SP) SAND WITH GRAVEL, fine to medium grained, light brown, moist, medium dense (SP) SAND, a little gravel, fine to medium grained, light brown, moist, medium dense (SP) SAND, a little gravel, fine to medium grained, light brown, moist, medium dense (SP) SAND, a little gravel, fine to medium grained, light brown, moist, medium dense (SP) TILL CLAYEY SAND, a little gravel, brown, stiff (SC) TILL CLAYEY SAND, a little gravel, gray, stiff (SC) DOGE GRAVEL Recurrent Project, Minneapolis, MIN MINNEAPOLIS, MIN MINNEAPOLIS, MINNEAPOL | | | | | | | | | | END OF | |
| DE NO: 03-02255 CCT: Proposed South Minneapolis Apartment Project; Minneapolis, MN SURFACE ELEVATION: 100.4 4.4.5" Bituminous pavement ST. Chashed lineatione base, brown, mostly sandy lean clay, a little gravel, dark (SM) ELEAN CLAY WITH SAND, fine grained, brown, moist, loose (SP-SM) LIGH Brown, moist, loose to medium dense (SP) SAND WITH GRAVEL, fine to medium dense (SP) SAND WITH GRAVEL, medium dense (SP) COARSE SAND WITH GRAVEL, medium dense (SP) LEAN CLAY WITH GRAVEL, medium dense (SP) SAND WITH GRAVEL, medium dense (SP) SAND WITH GRAVEL, medium dense (SP) SAND WITH GRAVEL, medium dense (SP) COARSE SAND WITH GRAVEL, medium dense (SP) SAND WITH GRAVEL, medium dense (SP) SAND WITH GRAVEL, medium dense (SP) COARSE SAND WITH GRAVEL, medium dense (SP) SAND WITH GRAVEL, medium dense (SP) | | 18 | SS | Z | 9 | LILL | 1 | , stiff (SC) | ŗavel, gray | | |
| OB NO: D3-02255 DOG OF BORING NO. | | 18 | | Ζ | 14 | | | vn, stiff | gravel, brov | CLAYEY (SC) | |
| OB NO: 03-02255 Proposed South Minneapolis Apartment Project; Minneapolis, MN SURFACE ELEVATION: 100.4 MATERIAL DESCRIPTION 4.5" Caushed limestone base, brown forcen of 1.5" FILL, mostly sandy lean clay, a little gravel, dark brown to brown, frozen of 1.5" SILTY SAND, fine grained, brown, firm, a lense of fat clay (CL) SAND WITH SILT, fine grained, brown, moist, loose (SP-SM) SAND WITH GRAVEL, fine to medium dense (SP) SAND WITH GRAVEL, fine to medium grained, light brown, moist, medium dense (SP) SAND, a little gravel, fine to medium grained, light brown, moist, medium dense (SP) SAND, a little gravel, fine to medium grained, light brown, moist, medium dense (SP) SAND, a little gravel, fine to medium grained, light brown, moist, medium dense (SP) SAND, a little gravel, fine to medium grained, light brown, moist, medium dense (SP) SAND, a little gravel, fine to medium grained, light brown, moist, medium dense (SP) SAND, a little gravel, fine to medium grained, light brown, moist, medium dense (SP) | | • | | | | | | fine (SP) | nedium to dium dense | \vdash | |
| OBNO: OBNO: OB-02255 Proposed South Minneapolis Apartment Project; Minneapolis, MN SURFACE ELEVATION: MATERIAL DESCRIPTION A.5" Bituminous pavement SULTY SAND, fine grained, brown, moist, loose of fat clay (CL) SAND WITH SLIT, fine grained, brown, moist, loose (SP-SM) SAND, a little gravel, fine to medium dense (SP) SAND WITH GRAVEL, fine to medium dense (SP) | | 16 | S | Z | 18 | | | grained, | to medium n dense (SI | | |
| DBNO: 03-02255 Proposed South Minneapolis Apartment Project; Minneapolis, MN SURFACE ELEVATION: 100.4 MATERIAL DESCRIPTION 4.5" Bituminous pavement 5" Crushed limestone base, brown to brown, frozen to 1.5' SILTY SAND, fine grained, brown, moist, loose of fat clay (CL) SAND WITH SILT, fine grained, brown, moist, loose (SP-SM) SAND, a little gravel, fine to medium dense (SP) BORDING NO. 12 COARSE ALLUVIUM 100 A | | 14 | SS | Z | 27 | COARSE ALLUVIUM | <i>F S S S S S S S S S S</i> | ium dense (SP) | fine to med t, medium | 1 1 1 1 | |
| OBNO: 03-02255 Proposed South Minneapolis Apartment Project; Minneapolis, MN SURFACE ELEVATION: 100.4 MATERIAL DESCRIPTION 4.5" Grushed limestone base, brown FILL, mostly sandy lean clay, a little gravel, dark SILTY SAND, fine grained, brown, moist, loose of fat clay (CL) SAND WITH SAND, brown, firm, a lense of fat clay (CL) SAND, a little gravel, fine to medium grained, light brown, moist, loose to medium dense (SP) LOG OF BORING NO. 1 MAC SAMPLE REC FIELD WC TYPE IN. WC T | | 10 | SS | × | 13 | | | | | 12 - | |
| DETECT: Proposed South Minneapolis Apartment Project; Minneapolis, MN | | ∞ | SS | Z | 13 | | | dense (SP) | o medium o | _11_ | |
| OB NO: 03-02255 Proposed South Minneapolis Apartment Project; Minneapolis, MN SURFACE ELEVATION: 100.4 MATERIAL DESCRIPTION 4.5" Bituminous pavement 5" Crushed limestone base, brown FILL, mostly sandy lean clay, a little gravel, dark brown to brown, frozen to 1.5' SILTY SAND, fine grained, brown, moist, loose (SM) LEAN CLAY WITH SAND, brown, firm, a lense of fat clay (CL) SAND WITH SILT, fine grained, brown, moist, loose (SP-SM) Log of Boring NO. 1 GEOLOGY N MC SAMPLE REC TYPE IN. WC COARSE ALLUVIUM F SU | | 16 | ss | Z | 6 | | | grained, | to medium | | |
| OB NO: 03-02255 CT: Proposed South Minneapolis Apartment Project; Minneapolis, MN SURFACE ELEVATION: 100.4 MATERIAL DESCRIPTION 4.5" Bituminous pavement FILL, mostly sandy lean clay, a little gravel, dark brown to brown, frozen to 1.5' SILTY SAND, fine grained, brown, moist, loose SILTY SAND, fine grained, brown, firm, a ALLUVIUM LEAN CLAY WITH SAND, brown, firm, a LOG OF BORING NO. 1 GEOLOGY N MC SAMPLE REC TYPE NIN WC FILL F SU F SU F SU FINE ALLUVIUM 6 M SS 18 | | 15 | SS | Z | 10 | | | own, moist, | grained, bro | SAND WITH SILT, loose (SP-SM) | |
| OB NO: 03-02255 CT: Proposed South Minneapolis Apartment Project; Minneapolis, MN SURFACE ELEVATION: 100.4 MATERIAL DESCRIPTION 4.5" Bituminous pavement 5" Crushed limestone base, brown FILL, mostly sandy lean clay, a little gravel, dark FILL, mostly sandy lean clay, a little gravel, dark LOG OF BORING NO. 1 SAMPLE REC TYPE IN. WC FIELD WC FIELD SU FIELD FELD SU FIEL | | 18 | SS | Z | 0 | ALLUVIUM FINE ALLUVIUM | | moist, loose firm, a | d, brown, 1 | | |
| OB NO: 03-02255 Proposed South Minneapolis Apartment Project; Minneapolis, MN SURFACE ELEVATION: 100.4 MATERIAL DESCRIPTION LOG OF BORING NO. 1 LOG OF BORING NO. 1 MO SAMPLE REC FIELD WC | | | | | | FILL | | gravel, darl | t s, brown lay, a little | را ا | |
| Proposed South Minneapolis Apartment Project; Minneapolis, | WC VELLD | | TYPE | l. | z | GEOLOGY | | ON | 100.4 DESCRIPTION | SURFACE EL | DEI FEI |
| 03-02255 | | | meapoli | Min | ect; | ment Proj | Aparti | | | l _i | PH |
| | | 1 | ORING NO |) OF B | 100 | | | | 10 | | <u> </u> |



| CC: DS CA: | BORING | | | 0-29½' 3 | DEPTH: L | END (| | | | 19 - CLAY 20 - brown 21 - | 17 – | 15 – | 12 <u> </u> | |) & 7 | | | 1 — pieces 2 — FILL. | DEPTH SUR IN FEET | PROJECT: | |
|-------------------|----------------|----------------|---------------|-------------------------|--------------------------|---------------|--|---|--|---------------------------------|-----------|------|-------------|---|-----------|---|--|--|---|--------------------|----|
| BL Rig: 33C | TAINS | | | .25" HSA | DRILLING METHOD | END OF BORING | SAND, fine to medium grained, brown, waterbearing, medium dense (SP) | SAND WITH GRAVEL, fine to medium grained, brown, waterbearing, dense (SP) | CLAYEY SAND, a little gravel, gray, stiff (SC) | brown mottled, stiff (SC) | | | | SAND, a little gravel, fine to medium grained, brown, moist, medium dense (SP) | | SAND, fine to medium grained, light brown, moist, medium dense (SP) | LEAN CLAY, light brown, stiff to very stiff, lenses of fat clay (CL) | 1.5" FILL, mostly silty sand with gravel and pieces of bituminous, dark brown, frozen 4" Crushed limestone base, brown, frozen FILL, mostly lean clay, brown, frozen to 1" | SURFACE ELEVATION: 98.7 MATERIAL DESCRIPTION | Proposed South | j |
| | | 1/4/05 | 1/3/05 | DATE | | | ined, brown se (SP) | ine to meding, dense (| ravel, gray, | gravel, gray, | | | | to medium se (SP) | | uined, light | , stiff to ve | brown, fro brown, fro brown, fro brown, frozen | 98.7 DESCRIPTIO | | |
| | | 10:25 | 1:35 | TIME | | | ŋ, | um SP) | stiff (SC) | a little | | | | grained, | | brown, | ry stiff, | vel and zen zen to 1" | Ŋ N | Minneapolis | |
| | | 31.0 | 31.0 | SAMPLED DEPTH | WATER | | | A A | 1 | | | | | | | | | | | Aparti | |
| | | 29.5 | 29.5 | D CASING DEPTH | WATER LEVEL MEASUREMENTS | | | COARSE ALLUVIUM | TILL | | | | | COARSE ALLUVIUM | | | FINE ALLUVIUM | FILL OR FINE ALLUVIUM | GEOLOGY | Apartment Project; | |
| | | 27.5 | 27.9 | CAVE-IN DEPTH | SURE | | 19 | 32 | | 12 | | 36 | 19 | 15 | 17 | 22 | 11 | | z | ject; | |
| | | ÇV . | 9 | | MENTS | | ₩ | | Σ | Z | | Z | Z | Z | Z | Z | Z | Z 77 77 | | Min | 1 |
| | | | | DRILLING FLUID LEVEL | 01 | | SS | SS | WI | SS | · · · · · | SS | SS | SS | SS | SS | SS | | | Minneapolis, | ** |
| | | | | | | | 12 | ∞ | 22 | 18 | | 16 | 18 | 16 | 16 | 16 | 22 | | REC IN. | s, MN | |
| | | 26.1 | 26.1 | WATER LEVEL | | | | | 14 12 | | | | | | | | | | WC I | Z | 4 |
| H | TERMINOLOGY ON | EXPLA | SHEE | THE A | NOTE: | | | | 123.8 | | | | | | | | | | WC DEN LABORATORY LESTS WC DEN LL PL PD | | |
| THIS LOG | \OLOG\ | EXPLANATION OF | SHEETS FOR AN | THE ATTACHED | NOTE: REFER TO | | | | | | | | | | | | | | PL PL | | |
| | NO. | 1OF | N | ED | TO | | 0.0 | 0.1 | | 0.0 | | 0.0 | 0.0 | 0.1 | 0.0 | 0.1 | 0.0 | 0.0 | PID (ppm) | | |



| COMPLEIBD: 1/3/03 | BORING | | - 1 | 0-29½' 3.25" HSA | DEPTH: DRILLING METHOD | END OF BORING | 1 1 1 | 23 - 24 - 25 - SAND, a little gravel, fine to medium grained, brown, moist to about 27' then waterbearing, | 19 – CLAYEY SAND, a little gravel, brown, very stiff (SC) | 15 - GRAVELLY SAND, fine to medium grained, 16 - brown, moist, medium dense (SP/GP) 17 - | 12 13 | SAND, a little gravel, fine to medium grained, light brown, moist, medium dense (SP) | 8 7 | SAND, fine grained, light brown, moist, medium dense (SP) | 1 1 | 5" Crushed limestone base, brown, frozen FILL, mostly lean clay, a little gravel, dark brown, frozen to 1' | DEPTH IN SURFACE ELEVATION: 99.1 MATERIAL DESCRIPTION | PROJECT: Proposed South Minneapolis Apartment Project; Minneapolis, | AET JOB NO: 03-02255 | |
|-------------------|----------------|----------------|---------------|-------------------------|--------------------------|---------------|----------|--|---|--|---------|--|-----|---|------------------|--|---|---|----------------------|--|
| | | | 1/3/05 | DATE | | | . | to medium | ravel, brow | to medium se (SP/GP) | | to medium 1 dense (SP | : | orown, moi | , stiff, lense | brown, fro | 99.1 DESCRIPTIO | th Minn | | |
| | | | 12:05 | TIME | | | ţ | grained, | n, very | grained, | | grained, | | st, medium | es of fat | dark | Ž | eapolis A | | |
| | | | 31.0 | SAMPLED DEPTH | WATE | | | | | | | | | | | | | part | | |
| | | + | 29.5 | ED CASING DEPTH | WATER LEVEL MEASUREMENTS | | | COARSE | TIIT | | | ALLUVIUM | | | FINE ALLUVIUM | FILL OR TOPSOIL | GEOLOGY | ment Proj | | |
| | | | 28.0 | CAVE-IN DEPTH | SURE | | 41 | 24 | 19 | 19 | 22 | 13 | 20 | 22 | 9 | | Z | ect; | 100 | |
| | 1 | | | | MENT | | 8 | [] | <u> </u> | Z | Z | Z | Z | Z | Z | TI | MC | Min | OF B(| |
| | | | | DRILLING FLUID LEVEL | | | S. S. | SS | SS | SS | SS | SS | SS | SS | ss | SU | SAMPLE TYPE | neapoli | LOG OF BORING NO | |
| | - | - | | | | | 16 | 14 | 16 | 16 | 16 | 15 | 14 | 12 | 20 | | REC. | s, MN | | |
| | | | 26.9 | WATER LEVEL | | | | | | | | | | | | | WC DE | 2 | 3 | |
| SIHI | TERMINOLOGY ON | EXPLANATION OF | SHEETS FOR AN | THE ATTACHED | NOTE: REFER TO | | | | | | | | | | | | & LABORATORY DEN LL PL | | (p. 1 of 1) | |
| THIS LOG | YDOT | ATION | FOR / | TACHI | EFER. | | | | | | | | | | | | | | | |
| | 0N | OF. | Z | -U | TO | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | | 0.0 | TESTS PID (ppm) | ļļ_ | | |



| · 1 | BORING 1/3/05 | | | 0-29½' 3.25" HSA | DEPTH: DRILLING METHOD | END OF BORING | 29 - GRAVELLY SAND, fine to medium grained 30 - brown, waterbearing, dense (SP) | 25 26 27 27 | 23 | 22 | 20 — 21 — | SAND, a little gravel, fine to medium grained, brown, moist to about 26.5' then waterbearing, medium dense (SP) | 15 - 16 - | SAND WITH GRAVEL, fine to medium 13 – grained, brown, moist, medium dense (SP) | 10 — 11 — moras, meanan dense (or) | 8 – SAND, fine to medium grained, light brown, | 5 - LEAN CLAY, light brown, stiff, lenses of fat 6 - clay (CL) | 3 - LEAN CLAY, dark brown, frozen to 1' (CL) clay (CL) | FILL, mostly silty sand with gravel and pieces of concrete, brown 4" Gravel base, brown, frozen | DEPTH IN SURFACE ELEVATION: 99.1 FEET MATERIAL DESCRIPTION | PROJECT: Proposed South | AET JOB NO: 03-02255 |
|----------|----------------|----------------|---------------|-------------------------|--------------------------|---------------|---|-------------|----------|----------|-----------|---|--------------------|---|------------------------------------|--|--|--|--|--|---------------------------|----------------------|
| | | | 1/3/05 | DATE | | | to medium e (SP) | ı | | | | to medium o' then wate | | fine to med dium dense | | ained, light | 1, stiff, lens | n, frozen to tled, stiff, l | ith gravel a | 99.1 DESCRIPTI | th Minr | |
| | | | 10:55 | TIME | | | grained, | | | | | grained, rbearing, | | ium (SP) | | brown, | ses of fat | 1' (CL) lenses of fa | ind pieces o | ON | Minneapolis | |
| | | | 31.0 | SAMPLED DEPTH | WATE | | | | | | | | | | | | | | | | Apart | |
| | | | 29.5 | CASING DEPTH | WATER LEVEL MEASUREMENTS | | | | | | | | COARSE ALLUVIUM | | | | FINE ALLUVIUM | | TOPSOIL | GEOLOGY | Apartment Project; | |
| | | | 27.8 | CAVE-IN DEPTH | SURE | | 47 | 27 | | | 18 | | 22 | 25 | 22 | 21 | <u> </u> | 11 | | z | ject; | 100 |
| | | | ·∞ | | MENT | | € | ₩W.W | | | X | | X | X | Z | X | Z | Z | ㅂ | MC | Min | of B |
| | | | | DRILLING FLUID LEVEL | | | SS | SS | <u> </u> | <u> </u> | SS | | SS | SS | SS | SS | Z SS | ss | SU | SAMPLE TYPE | Minneapolis, | LOG OF BORING NO |
| | | | | EVEL | | | 16 | 16 | | | 14 | | 14 | 14 | 15 | 16 | 20 | 14 | J | REC IN. | | · 1 |
| | | | 26.4 | WATE | | | | | | | | | | | | | 34 | | | WC DI | M | |
| | EI E | EX. | | ER T | z | | | | | | | | | | | | | | | D & LA | | 4 (p. |
| THIS | RMINO | (PLAN | HEETS | TA EH | NOTE: R | | | | | | | | | | | | | | | LABORATORY EN LL PL | | 1 of 1) |
| THIS LOG | TERMINOLOGY ON | EXPLANATION OF | SHEETS FOR AN | THE ATTACHED | REFER TO | | 0 | | | | | | | | | | | | | | | |
| | 8 | OF | z | Ü | го | | 0.0 | 0.1 | | | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | TESTS PID (ppm) | 17 | |



| | BORING COMPLETED: 12/29/04 | | | 0-29½' 3.25" HSA | DEPTH: DRILLING METHOD | END OF BORING | 29 – SAND, fine to medium grained, light brown, 30 – waterbearing, medium dense (SP) | 26 | 24 — 25 — | | SAND WITH GRAVEL, medium to fine 21 – grained, light brown, moist, dense to medium dense (SP) | 19 - | GRAVELLY SAND, fine to medium grained, 16 - brown, moist, very dense (SP) | 13 – | 10 – 11 – SAND, a little gravel, medium to fine grained, brown, moist, medium dense (SP) | SAND, a little gravel, fine to medium grained, light brown, moist, medium dense (SP) | 5 - LEAN CLAY, light brown, stiff, lenses of fat 6 - clay (CL) | | FILL, mostly sandy lean clay, a little gravel, dark | | DEPTH SURFACE ELEVATION: MATERIAL | PROJECT: Proposed South Minneapolis Apartment Project; Minneapolis, | AET JOB NO: 03-02255 |
|----------|-------------------------------|----------------|---------------|------------------|--------------------------|---------------|--|----------------|-----------|-------------|---|-------|---|----------|---|--|--|---------------------------------|---|---------------|--|---|----------------------|
| | | | 12/29/04 | DATE | | | ined, light l se (SP) | | | | nedium to f t, dense to n | | to medium SP) | | ium to fine ise (SP) | to medium n dense (SF | ı, stiff, lens | n, stiff (CL) tled, stiff (C | lay, a little | se, light bro | EVATION: 100.7 MATERIAL DESCRIPTION | th Minn | |
| | | | 12:40 | TIME | | | orown, | | | | ine nedium | | grained, | | grained, | grained, | es of fat | 出) | gravel, darl | wn, frozen | ž | eapolis / | |
| | | | 31.0 | SAMPLED DEPTH | WATE | | | | | | | | | | | | | | | | | part | |
| | | | 29.5 | CASING DEPTH | WATER LEVEL MEASUREMENTS | | | | | | | | COARSE ALLUVIUM | | | | ALLUVIUM | FINE | TOPSOIL OR | FILL | GEOLOGY | ment Pro | |
| | | | 28.7 | CAVE-IN DEPTH | SURE | | 29 | | 29 | | 39 | | 55 | 11 | 15 | 20 | 10 | č | 1 | | z | ect; | TOC |
| | | | .7 | | MENT | | 8 | 4 | Z | | Z | ^ ^ ^ | Z | X | Z | X | Z | - | < | ן א | MC | Min | LOG OF BORING NO |
| | | | | DRIL | V 3 | | ss | ~~~ | SS | | SS | | SS | SS SS | SS | SS | SS | | 2 | SCS | SAMPLE TYPE | neap | ORING |
| | | | | PLUID LEVEL | | | 18 | | 15 | | 15 | | 10 | 18 | 18 | 18 | S 18 | | _ | CCC | EE REC | olis, | NO. |
| | | | 28.1 | WATER LEVEL | | | | | | | | | | | ∞ | | | | * | | | N | 5 |
| HI | TERMIN | EXPLA | SHEE | _ | NOTE: | | | | | | | | | | | | - | | | | WC DEN LABORATORY TESTS WC DEN LL PL PID | | (p. 1 |
| THIS LOG | TERMINOLOGY ON | EXPLANATION OF | SHEETS FOR AN | THE ATTACHED | NOTE: REFER TO | | | | | | | | 45 -710 | | | 0 | 0 | | | d | ATORY TES | | of 1) |
| | ž | Ť | | | O | | | | | | | | -ui | | | 0.0 | 0.0 | |) A | 0.0 | PID | I | l l |



| THIS LOG | | | | | \perp | | | | | | ETED: 12/29/04 CA: BL Rig: 33C | CC: DS |
|--------------------|------------|--------|------------|-------------------------|----------|------------------|---------------------------------|----------------------------|---------------------|---------------------------------------|--|----------------------|
| TERMINOLOGY ON | TEI EX | | | | - | | | | | | | BORING |
| SHEETS FOR AN | 5 | 28. | | | 7 | 28.7 | 29.5 | 31.0 | 2:00 | 12/29/04 | | |
| THE ATTACHED | 贸 | WAT | NG | DRILLING FLUID LEVEL | | CAVE-IN DEPTH | CASING DEPTH | SAMPLED DEPTH | TIME | DATE | ½' 3.25" HSA | 0-291/2 |
| NOTE: REFER TO | z | | | 01 | ENT | SUREM | WATER LEVEL MEASUREMENTS | WATE | | | TH: DRILLING METHOD | DEPTH: |
| | | | | | | | | | | | END OF BORING | 31 |
| | | | 16 | ss | 8 | 33 | | | n, moist to (SP) | ained, browing, dense | SAND, fine to medium grained, brown, moist to about 28.5' then waterbearing, dense (SP) | |
| | | - | | ~~ | 1 | -14 | | | | | | 27 – |
| | | | 10 | 212 | <u> </u> | 32 | | | | | | 26 – |
| | | | 1 | | | | | | | | | 24 — 25 — |
| | | | | | | | | | | | | 23 — |
| | | | | | | | | | dense to | t, medium | grained, light brown, moist, medium dense to dense (SP) | 21 – 22 – |
| | | | 16 | SS | Z | 26 | | | lium | fine to med | SAND WITH GRAVEL, fine to medium | 19 – 20 – |
| | | | _ | ↓ ↓ | | | | | | | | 18 — |
| | | | 16 | SS | Z | 40 | COARSE ALLUVIUM | | medium grained, | to | GRAVELLY SAND, fine brown, moist, dense (SP) | 15 – 16 – 17 – |
| Ċ | | | | | | ţ | | | | | | 14 |
| 0 | | | | S S | ζ | 'n | | | 9041 10.5 | ii Ciay at a | (SP) | 12 — 13 — |
| 0.0 | | | 16 | SS | Z | 15 | | | brown, | ained, light | SAND, fine to medium grained, light brown, | |
| 0.0 | | | 18 | SS | Z | 20 | | 10.200.700. 10.200.700. | grained, 1) | to medium nse (SP-SN | SAND WITH SILT, fine to medium grained, brown, moist, medium dense (SP-SM) | 9 8 7 |
| 0.0 | | 32 | 20 | SS | Z | ∞ | ALLUVIUM | | laminations of | n, firm, lar | LEAN CLAY, light brown, fat clay (CL) | 6 |
| 0.0 | | | 20 | SS | Z | 15 | FINE | | CL) n mottled to | irk gray irk brown (n and brow | LEAN CLAY, black to dark brown (CL) LEAN CLAY, dark brown and brown mottled to brown, stiff (CL) | 4 3 1 |
| 0.0 | | | | | ጃ ኳ | | FILL | | own, frozen | t ise, light br | 6.5" Crushed limestone base, light brown, to 9" | ٥ <u>١</u> |
| | DEN | | REC IN. | SAMPLE TYPE | MC | Z | GEOLOGY | | ON | DESCRIPTION. | SURFACE ELEVATION: | FEET |
| & LABORATORY TESTS | [D & I & I | RIFI D | | | | | | | | 100 0 | | DEPTH |
| | | Z | lis, I | neapo | Min | ect; I | Apartment Project; Minneapolis, | Apart | neapolis . | ıth Mini | Pro | PROJECT: |
| 1 of 1) | 6 (p. | | ő | LOG OF BORING NO | OF B | LOG | | | | | B NO: 03-02255 | AET JOB NO: |



| SAMPLE REC TYPE IN. SAMPLE REC WC DEN LL XRF (ppm) MC 48 MC 56 MC 56 |
|--|
| FIELD & LABORATORY TO LEVEL WATER LEVEL SHEETS FOR A EXPLANATION TERMINOLOGY THIS LOG |
| MC 48 MC DEN LL XRF WC DEN LL XRF |
| MC 48 MC DEN LL XRF WC DEN LL XRF |
| MC 48 MC DEN LL XRF WC DEN LL XRF |
| MC 48 MC DEN LL XRF WC DEN LL XRF |
| FIELD & LABORATORY TO LEVEL WATER LEVEL SHEETS FOR A EXPLANATION TERMINOLOGY THIS LOG |
| LABORATORY TO NOTE: REFER THE ATTACH SHEETS FOR A EXPLANATION TERMINOLOGY THIS LOG |
| LABORATORY TO NOTE: REFER THE ATTACH SHEETS FOR A EXPLANATION TERMINOLOGY THIS LOG |
| IE: REFER TE E ATTACHEL EETS FOR ALL LANATION (MINOLOGY) |
| SFER T ACHEL 30R AI 11ION (JOGY (|
| |



| I | BORING COMPLETED: 12/30/04 | | | 0-29½' 3.25" HSA | DEPTH: DRILLING METHOD | END OF BORING | SAND, a little gravel, medium to fine grained, light brown, moist to about 28' then waterbearing, dense to medium dense (SP) waterbearing, dense to medium dense (SP) | 24 | 21 - 22 - 23 | 19 – | SAND WITH GRAVEL, possible cobbles, 17 – medium to coarse grained, brown, moist, medium dense (SP) | 15 | 13 | 11 | 8 – SAND, a little gravel, fine to medium grained, 9 – light brown, moist, medium dense (SP) | 5 - SAND WITH SILT, fine grained, brown, moist, 6 - medium dense (SP-SM) | | 2./5" FILL, mixture of weathered bituminous and silty sand, black 3.75" Crushed limestone base, light brown, frozen to 7" | DEPTH SURFACE ELEVATION: 100.6 FEET MATERIAL DESCRIPTION | PROJECT: Proposed South | AET JOB NO: 03-02255 | |
|----------|-------------------------------|----------------|---------------|-------------------------|--------------------------|---------------|---|----|--------------|----------|--|--------------------|-----|-----|--|--|------------------|--|--|-------------------------|----------------------|--|
| | | | 12/30/04 | DATE | | | um to fine g 28' then um dense (| | | | ossible cobl orown, moi | | | | o medium dense (SP) | ained, brov |)L) wn mottle | se, light br | 100.6 ESCRIPTIO | | | |
| | | | 10:50 | TIME | | | grained, (SP) | | | | bles, st, | | | | grained,) | vn, moist, | d, firm | minous own, | Z | Minneapolis . | | |
| | | | 31.0 | SAMPLED DEPTH | WATER | | | | | | | 2 | | | | | | | | Aparti | | |
| | | | 29.5 | D CASING DEPTH | WATER LEVEL MEASUREMENTS | | | | | | | COARSE ALLUVIUM | | | | | ALLUVIUM | TOPSOIL | GEOLOGY | Apartment Project; | | |
| | | | 28.5 | CAVE-IN DEPTH | SURE | | 33 | | 7 |) % | | 28 | 15 | 12 | 11 | 16 | - ∞ | | z | | 70T | |
| | | | in | | VENT: | | ₹ ₹ | | | < | | Z | Z | X | Z | Z | Z | ZΉ | () | Min |) OF B | |
| | | | | DRILLING FLUID LEVEL | 0.1 | | SS SS | | 6 | c A | | SS | SS | SS | SS | SS | SS | SS S | | Minneapolis, | LOG OF BORING NO | |
| | + | - | | | | | 18 | | 4 | <u> </u> | | 18 | 18 | 20 | 18 | 18 | 22 | | REC | s, MN | Ī | |
| | | | 27.9 | WATER LEVEL | | | | | | | | | | | | | | | FIELD & LABORATORY TESTS WC DEN LL PL (ppm) | | 7 | |
| TH | TERMINOLOGY ON | EXPLA | SHEE | THE A | NOTE: | | | | | | | | | | | | | | & LABORA | | (p. 1 c | |
| THIS LOG | VOLOG | EXPLANATION OF | SHEETS FOR AN | THE ATTACHED | REFER TO | | | | | | | | | | | | | | ATORY PL | | of 1) | |
| | Y ON | N OF | AN | ED | ≀TO | | | | | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.4 | PID (ppm) | | | |



| CC: PS | BORIN | | | | DEPTH: | O | , v | . 4 3 2 | | | DEPTH IN FEET | PROJECT: | AET JOB NO: |
|----------|----------------|----------------|---------------|-------------------------|--------------------------|---------------|--|-----------------------|--------------------------|---|--|--|-------------------|
| CA. | BORING 2/22/05 | | - | 0-6' Geoprobe | TH: DRILLING METHOD | END OF BORING | POORLY GRADED SAND, fine grained, brown (SP) | LEAN CLAY, brown (CL) | ORGANIC CLAY, black (OL) | FILL, mostly class 5 gravel, tan, frozen to 21/2' | SURFACE ELEVATION: Not Determined MATERIAL DESCRIPTION | 1 | Ö. |
| | | | | DATE TIME | | | D, fine grained, | | OL) | l, tan, frozen to $2\frac{1}{2}$ | ot Determined DESCRIPTION | South Minneapolis Apartment Project; Minneapolis, MN | |
| | | | None | SAMPLED DEPTH | WATE | | | | | | | nt Pro | . |
| | | - | Taken | ED CASING H DEPTH | WATER LEVEL MEASUREMENTS | | COARSE ALLUVIUM | FINE ALLUVIUM | TOPSOIL | FILL | GEOLOGY | lect; Minn | |
| | | | Refer To | CAVE-IN DEPTH | SUREM | | | | | | z | eapol | LOG |
| | - | | To | | ENTS | | Z | | F/N | | MC S | IS, M | OF BOI |
| | | | "MC" | DRILLING FLUID LEVEL | | | Ν | | 5 | | SAMPLE TYPE | | LOG OF BORING NO. |
| | | | | | | | 20 | 3 | 48 | | REC. | | 1 |
| | | | Column | WATER LEVEL | | | | | | | WC I | | 7A |
| | TER | | _ | | NO. | | | | | | DEN DEN | | (p. |
| THIS LOG | MINOI | LANA | EETS I | E ATT | TE: RI | | | | | | ORATO LL > | | 1 of 1) |
| LOG | TERMINOLOGY ON | EXPLANATION OF | SHEETS FOR AN | THE ATTACHED | NOTE: REFER TO | | | 0.2 | | 0.2 | DEN LABORATORY TESTS | | 1 |



| THIS LOG | | | | | | | | | | S CA: BL Rig: 33C | CC: DS |
|---------------------|----------------|-------------------------|---|------------------|------|------------------------------------|------------------|----------------------|---|--|--------------------------------------|
| TERMINOLOGY ON | | | | | | | | | | - 1 | BORING |
| EXPLANATION OF | | | | | | - | | | | | |
| SHEETS FOR AN | 27.5 | | | 28.5 | 28 | 29.5 | 31.0 | 9:35 | 1/3/05 | - 1 | |
| THE ATTACHED | WATER LEVEL | DRILLING FLUID LEVEL | DRII | CAVE-IN DEPTH | CAV | ED CASING DEPTH | SAMPLED DEPTH | TIME | DATE | 9½' 3.25" HSA | 0-291/2" |
| NOTE: REFER TO | | | IS | MEN | SURE | WATER LEVEL MEASUREMENTS | WATE | | | TH: DRILLING METHOD | DEPTH: |
| | | | | | | | | | | END OF BORING | 31 |
| | | 18 | SS | \$ | 14 | COARSE ALLUVIUM | | grained, (SP) | ium to fine | SAND, a little gravel, medium to fine grained, brown, waterbearing, medium dense (SP) | 29 — |
| | | SS 22 | s F | ≼ | 10 | ILLE | | , stiff (SC | ;ravel, gra) | CLAYEY SAND, a little gravel, gray, stiff (SC) | 24 - 25 - 26 - 27 - 28 - 28 - 28 |
| | | SS 18 | S | Z | 21 | | | wn, very | ;ravel, brov | CLAYEY SAND, a little gravel, brown, very stiff (SC) | 19 - 20 - 21 - 22 - 23 - |
| | | SS 12 | S | Z | 49 | | | medium grained, | to | GRAVELLY SAND, fine brown, moist, dense (SP) | 15 - 17 - 17 - 17 |
| 0.0 | | SS 16 | S Z | Z | 17 | COARSE ALLUVIUM | | rse graine | lium to coa | SAND, a little gravel, medium to coarse grained, brown, moist, medium dense (SP) | 12 - |
| 0.0 | | SS 12 | A CF | Z | 17 | | | | | | 10 - |
| 0.0 | | SS 20 | XX S | Z | 10 | | | n grained, ; (SP) | to mediun dium dense | SAND, a little gravel, fine to medium grained, brown, moist, loose to medium dense (SP) | 0 8 7 |
| 0.0 | | SS 16 | S | Z | 9 | | | grained, | stiff (CH) o medium M) | FAT CLAY, brown, very stiff (CH) SAND WITH SILT, fine to medium grained, brown, moist, loose (SP-SM) | 6 5 4 |
| 0.0 | | SU SU SS 18 | (A) | Z ZF | 19 | TOPSOIL FINE ALLUVIUM | | h brown, | se, light br lay, grayis en to 1' (Cl | 3.5" Crushed limestone base, light brown, frozen" FILL, mostly sandy lean clay, grayish brown, frozen LEAN CLAY, black, frozen to 1' (CL/OL) | 2 3 2 1 |
| DEN LL PL (ppm) 0.0 | FIELD | PLE REC | SAN | F MC | z | GEOLOGY | | ON | 100.5 DESCRIPTION | SURFACE ELEVATION: 100.5 MATERIAL DESCRIPTION | DEPTH |
| | | polis, I | neal | Mi | ect; | Apartment Project; Minneapolis, MN | Apari | Minneapolis | | Pro | PROJECT: |
| (p. 1 of 1) | ∞ | 3 NO. | LOG OF BORING NO. | 3 OF I | L01 | | | | | OB NO: 03-02255 | AET JOB NO: |



| cc: PS | BORING COMPLETED: | | | -0 | DEPTH: | o | , u | 4 (| 2 2 | 1 | DEPTH IN FEET | PROJECT: | AET JOB NO: |
|-----------------------|----------------------|----------------|---------------|-------------------------|--------------------------|---------------|--|-----------------------|-----------------------|---|---|---|-------------------|
| CA: BT Rig: 77 | ETED: 2/22/05 | | | 0-6' Geoprobe | H: DRILLING METHOD | END OF BORING | POORLY GRADED SAND, fine to medium grained, brown (SP) | LEAN CLAY, brown (CL) | ORGANIC CLAY, black (| FILL, mostly silty sand with gravel, light brown and dark brown, frozen to $2\frac{1}{2}$ | SURFACE ELEVATION: Not Determined MATERIAL DESCRIPTION | 1 | 1 |
| | | | | DATE TIME S | | | D, fine to medium | | OL) | th gravel, light brown 2½' | EVATION: Not Determined MATERIAL DESCRIPTION | South Minneapolis Apartment Project; Minneapolis, | : |
| | | | None | SAMPLED DEPTH | WATE | ÷ | | | | | | t Pro | • |
| | | | Taken | ED CASING DEPTH | WATER LEVEL MEASUREMENTS | | COARSE ALLUVIUM | WEATHERED SOIL | TOPSOIL | FILL | GEOLOGY | ject; Mini | |
| | | | Refer To | CAVE-IN DEPTH | SURE | | | ΙÜ | | | z | neap | LOC |
| | | | r To | THU | MENT | | Z | | F/M | | MC | olis, | 3 OF B |
| | | | "MC" | DRILLING FLUID LEVEL | Ų1 | | MC | | MC | | SAMPLE TYPE | MZ | LOG OF BORING NO. |
| _ | | | | | | | 24 | | 48 | | REC IN. | | ĺ |
| | | | Column | WATER LEVEL | | | | | | | WC | | 8A |
| | TER | EXP | | | NO. | | | | | | DEN DEN | | (p. |
| DOT STH.I. | TERMINOLOGY ON | EXPLANATION OF | SHEETS FOR AN | THE ATTACHED | NOTE: REFER TO | | | | - | | ELD & LABORATORY TESTS /C DEN LL XRF (ppm) | | 1 of 1) |
| DOG |) ABO | TION C | OR A | ACHEL | FER T | | | | | | ORY TE | | 1) |
| | Ž | F | 4 | | 0 | | 0.4 | | 0.5 | 0.5 | (tuddd) | | 8 |