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M-045

Formerly Utilized Sites Remedial Action Program (FUSRAP)
Contract No. DE-AC05-81OR20722

RADIOLOGICAL CHARACTERIZATION REPORT FOR THE LODI MUNICIPAL PARK

Lodi, New Jersey

November 1988

Bechtel National, Inc.

057116

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Post Office Box 2001
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Attention: Peter J. Gross, Director
Technical Services Division

Subject: Bechtel Job No. 14501, FUSRAP Project
DOE Contract No. DE-AC05-81OR20722
Publication of the Radiological Characterization Reports for the Residential Properties at 7 Branca Court, 11 Branca Court, 16 Long Valley Road, 18 Long Valley Road, 20 Long Valley Road, 22 Long Valley Road, 26 Long Valley Road, 11 Redstone Lane, and the Lodi Municipal Park, in Lodi, New Jersey
Code: 7310/WBS: 138

Reference: Letter from S. K. Oldham (DOE), 88-669 dated October 19, 1988, to B. W. Clemens (BNI), "Final Comments on the Prepublication Draft of the Radiological Characterization Reports for the Residential Properties at 7 Branca Court, 11 Branca Court, 16 Long Valley Road, 18 Long Valley Road, 20 Long Valley Road, 22 Long Valley Road, 26 Long Valley Road, 11 Redstone Lane, and the Lodi Municipal Park, in Lodi, New Jersey," CCN 056527.

Dear Mr. Gross:

Enclosed are six copies each of the published version of the nine characterization reports listed above. Incorporated in these reports are comments based on the reference above and additional discussions between N. C. Ring and S. K. Oldham of your office and J. D. Berger of ORAU.

These publications also incorporate changes in wording regarding site release as requested by S. K. Oldham and A. Avel.

Please notify me should you require additional copies (6-1677).

Very truly yours,

D Lenwood for

B. W. Clemens
Project Manager - FUSRAP

CONCURRENCE

SKL	DG			

BWC/skl:1750x
Enclosures: As stated

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J. F. Wing, w/o

DOE/OR/20722-175

RADIOLOGICAL CHARACTERIZATION REPORT FOR THE LODI MUNICIPAL PARK LODI, NEW JERSEY

NOVEMBER 1988

Prepared for

UNITED STATES DEPARTMENT OF ENERGY

OAK RIDGE OPERATIONS OFFICE

Under Contract No. DE-AC05-81OR20722

By

N. C. Ring and S. K. Livesay

Bechtel National, Inc.

Oak Ridge, Tennessee

Bechtel Job No. 14501

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ABBREVIATIONS

cm	centimeter
cm^2	square centimeter
cpm	counts per minute
dpm	disintegrations per minute
ft	foot
h	hour
in.	inch
l	liter
l/min	liters per minute
m	meter
m^2	square meter
MeV	million electron volts
µR/h	microroentgens per hour
mi	mile
mi^2	square mile
min	minute
mrad/h	millirad per hour
mrem	millirem
mrem/yr	millirem per year
pCi/g	picocuries per gram
pCi/l	picocuries per liter
WL	working level
yd	yard
yd^3	cubic yards

1.0 INTRODUCTION AND SUMMARY

1.1 INTRODUCTION

The 1984 Energy and Water Appropriations Act authorized the U.S. Department of Energy (DOE) to conduct a decontamination research and development project at four sites, including the site of the former Maywood Chemical Works (now owned by the Stepan Company) and its vicinity properties. The work is being administered by the Formerly Utilized Sites Remedial Action Program (FUSRAP), one of two remedial action programs under the direction of the DOE Division of Facility and Site Decommissioning Projects. The residential properties in Lodi, New Jersey, are included in FUSRAP as vicinity properties. Figure 1-1 shows the location of the Lodi vicinity properties in relation to the former Maywood Chemical Works.

The United States Government initiated FUSRAP in 1974 to identify, clean up, or otherwise control sites where low activity radioactive contamination (exceeding current guidelines) remains from the early years of the nation's atomic energy program or from commercial operations that resulted in conditions Congress has mandated DOE to remedy (Ref. 1).

FUSRAP is currently being managed by DOE Oak Ridge Operations. As the Project Management Contractor for FUSRAP, Bechtel National, Inc. (BNI) is responsible to DOE for planning, managing, and implementing FUSRAP.

1.2 PURPOSE

The objective of the 1986 survey performed by BNI was to locate the horizontal and vertical boundaries of radionuclide concentrations exceeding remedial action guidelines.

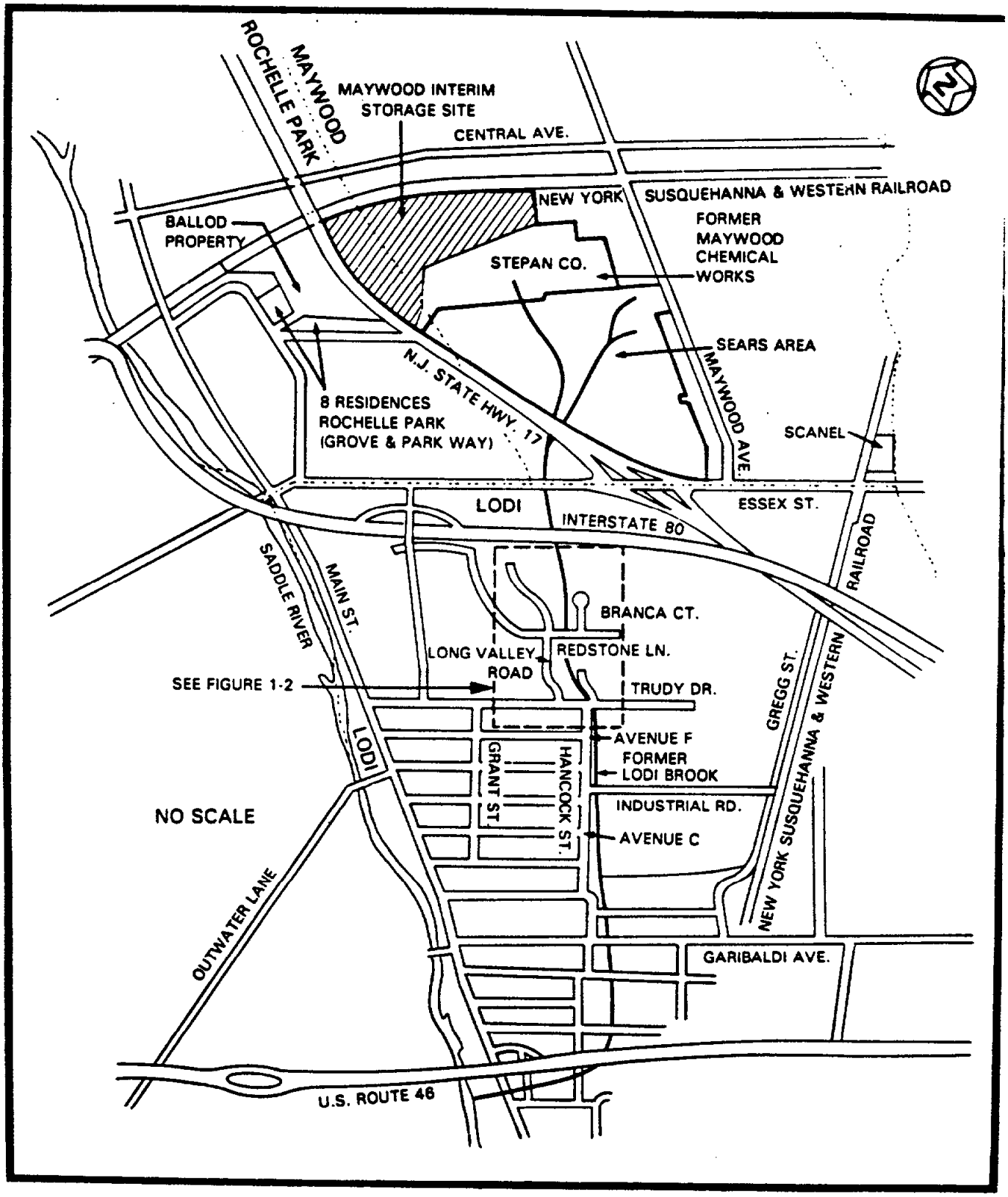

FIGURE 1-1 LOCATION OF LODI VICINITY PROPERTIES

1.3 SUMMARY

This report summarizes the procedures and results of the radiological characterization of the property at Lodi Municipal Park (Figure 1-2) in Lodi, New Jersey, conducted from September through December 1986 and three additional boreholes drilled in December 1987.

Ultimately, the data generated during the radiological characterization will be used to define the complete scope of remedial action necessary to release the site.

On the basis of information gathered during the radiological characterizations of several residential properties near this property, thorium-232 is most likely the primary contaminant of the property. In addition, historical information concerning the route of the Lodi Brook, which is believed to be a primary source of transportation for contamination in this area, supports the information obtained during these characterizations.

Because the major contaminants at the vicinity properties are thorium and radium, the decontamination guidelines provide the appropriate guidance for the cleanup activities. DOE believes that these guidelines are conservatively low for considering potential adverse health effects that might occur in the future from any residual contamination. The dose contributions from uranium and any other radionuclides not numerically specified in these guidelines are not expected to be significant following decontamination. In addition, because the vicinity properties will be decontaminated in a manner to reduce future doses to levels that are as low as reasonably achievable (ALARA), DOE will ensure that most of the radioactivity present at these vicinity properties will be removed during the cleanup (Ref. 2).

Downhole gamma logging data ranged from 9,000 to 269,000 cpm, and showed contamination ranging from the surface to 7 ft in depth.

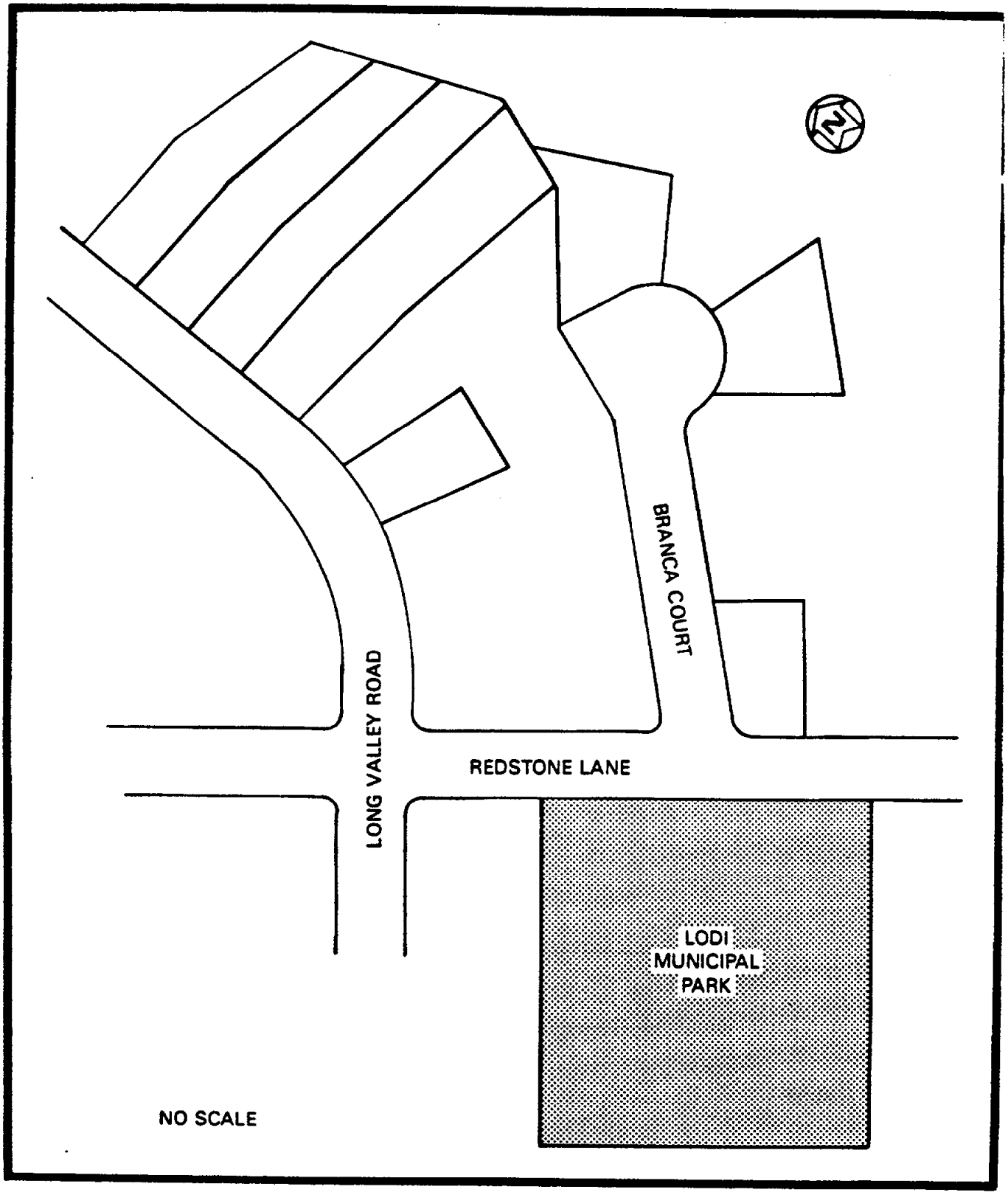

FIGURE 1-2 LOCATION OF LODI MUNICIPAL PARK

The contamination appears to trend off the property to the southeast, southwest, and northeast.

Exterior gamma radiation exposure rate measurements ranged from 9 to 82 μR/h, including background.

2.0 SITE HISTORY

The Maywood Chemical Works was founded in 1895. During World War I (in 1916), the company began processing thorium from monazite sand for use in manufacturing gas mantles for various lighting devices. The company continued this work until 1956. Process wastes from manufacturing operations were pumped to two areas surrounded by earthen dikes (northern and southern diked areas) on property west of the plant. Subsequently, some of the contaminated wastes migrated onto adjacent and vicinity properties.

In 1928 and again between 1944 and 1946, some of the residues from the processing operations were moved from the company's property and used as mulch and fill in nearby low-lying areas. The fill material consisted of tea and cocoa leaves mixed with other material resulting from operations at the plant and apparently also contained thorium process wastes (Ref. 3).

It is not known for certain how the properties in Lodi were contaminated. According to an area resident, fill from an unknown source was brought to Lodi and spread over large portions of the previously low-lying and swampy area. For several reasons, however, a more plausible explanation is that the contamination migrated along a drainage ditch originating on the Maywood Chemical Works property. It can be seen from photographs and tax maps of the area that the course of a previously existing stream known as Lodi Brook, which originated at the former Maywood Chemical Works, generally coincides with the path of contamination in Lodi. The brook was subsequently replaced by a storm drain system as the area was developed. Secondly, samples taken from Lodi properties indicate elevated concentrations of a series of elements known as rare earths. Rare earth elements are typically found in monazite sands, which also include thorium. This type of sand was feedstock at the Maywood Chemical Works, and elevated levels are known to exist in the by-product of the extraction process. Third, the ratio of thorium to other radionuclides found in these Lodi properties is

comparable to the ratio found in contaminated material on other properties in Lodi (Ref. 4). And finally, long-time residents of Lodi recall chemical odors in and around the brook in Lodi and steam rising off the water. These observations suggest discharges of contaminants occurring upstream.

The Stepan Chemical Company (now called the Stepan Company) purchased Maywood Chemical Works in 1959. The Stepan Company itself has never been involved in the manufacture or processing of any radioactive materials (Ref. 5).

2.1 PREVIOUS RADIOLOGICAL SURVEYS

January 1981 - The Nuclear Regulatory Commission (NRC) directed that a survey of the Stepan Company property and its vicinity be conducted. Using the Stepan Company plant as the center, a 4-mi^2 aerial survey conducted by the EG&G Energy Measurements Group identified anomalous concentrations of thorium-232 to the north and south of the Stepan Company property. The Lodi residential properties were included in this survey (Ref. 6).

June 1984 - In June 1984, Oak Ridge National Laboratory (ORNL) conducted a "drive by" survey of Lodi using its "scanning van." Although not comprehensive, the survey indicated areas requiring further investigation (Ref. 7).

September 1986 - At the request of DOE, ORNL conducted radiological surveys of the vicinity properties in Lodi, New Jersey, for the purpose of determining which properties contained radioactive contamination in excess of guidelines and would require remedial action (Ref. 8).

2.2 REMEDIAL ACTION GUIDELINES

Table 2-1 summarizes the DOE guidelines for residual contamination. The thorium-232 and radium-226 limits listed in Table 2-1 will be

used to determine the extent of remedial action required at the vicinity properties. DOE developed these guidelines to be consistent with the guidelines established by the Environmental Protection Agency (EPA) for the Uranium Mill Tailings Remedial Action Program.

TABLE 2-1

SUMMARY OF RESIDUAL CONTAMINATION GUIDELINES FOR THE LODI VICINITY PROPERTIES

BASIC DOSE LIMITS

The basic limit for the annual radiation dose received by an individual member of the general public is 100 mrem/yr.

SOIL (LAND) GUIDELINES (MAXIMUM ALLOWABLE LIMITS)

Radionuclide	Soil Concentration (pCi/g) above background[a,b,c]
Radium-226 Radium-228 Thorium-230 Thorium-232	5 pCi/g, averaged over the first 15 cm of soil below the surface; 15 pCi/g when averaged over any 15-cm-thick soil layer below the surface layer.

STRUCTURE GUIDELINES (MAXIMUM ALLOWABLE LIMITS)

Airborne Radon Decay Products

Generic guidelines for concentrations of airborne radon decay products shall apply to existing occupied or habitable structures on private property; structures that will be demolished or buried are excluded. The applicable generic guideline (40 CFR 192) is: In any occupied or habitable building, the objective of remedial action shall be, and reasonable effort shall be made to achieve, an annual average (or equivalent) radon decay product concentration (including background) not to exceed 0.02 WL.[d] In any case, the radon decay product concentration (including background) shall not exceed 0.03 WL. Remedial actions are not required in order to comply with this guideline when there is reasonable assurance that residual radioactive materials are not the cause.

External Gamma Radiation

The average level of gamma radiation inside a building or habitable structure on a site shall not exceed the background level by more than 20 μR/h.

Indoor/Outdoor Structure Surface Contamination

	Allowable Residual Surface Contamination[e] (dpm/100 cm^2)		
Radionuclide[f]	Average[g,h]	Maximum[h,i]	Removable[h,j]
Transuranics, Ra-226, Ra-228, Th-230, Th-228 Pa-231, Ac-227, I-125, I-129	100	300	20
Th-Natural, Th-232, Sr-90, Ra-223, Ra-224 U-232, I-126, I-131, I-133	1,000	3,000	200

TABLE 2-1

(continued)

Indoor/Outdoor Structure Surface Contamination (continued)

Radionuclide[f]	Allowable Residual Surface Contamination[e] (dpm/100 cm^2) Average[g,h]	Maximum[h,i]	Removable[h,j]
U-Natural, U-235, U-238, and associated decay products	5,000 α	15,000 α	1,000 α
Beta-gamma emitters (radionuclides with decay modes other than alpha emission or spontaneous fission) except Sr-90 and others noted above	5,000 β-γ	15,000 β-γ	1,000 β-γ

[a]These guidelines take into account ingrowth of radium-226 from thorium-230 and of radium-228 from thorium-232, and assume secular equilibrium. If either thorium-230 and radium-226 or thorium-232 and radium-228 are both present, not in secular equilibrium, the guidelines apply to the higher concentration. If other mixtures of radionuclides occur, the concentrations of individual radionuclides shall be reduced so that the dose for the mixtures will not exceed the basic dose limit.

[b]These guidelines represent residual concentrations above background averaged across any 15-cm-thick layer to any depth and over any contiguous 100-m^2 surface area.

[c]Localized concentrations in excess of these limits are allowable provided that the average concentration over a 100-m^2 area does not exceed these limits.

[d]A working level (WL) is any combination of short-lived radon decay products in 1 liter of air that will result in the ultimate emission of 1.3 x 10^5 MeV of potential alpha energy.

[e]As used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

[f]Where surface contamination by both alpha- and beta-gamma-emitting radionuclides exists, the limits established for alpha- and beta-gamma-emitting radionuclides should apply independently.

[g]Measurements of average contamination should not be averaged over more than 1 m^2. For objects of less surface area, the average shall be derived for each such object.

[h]The average and maximum radiation levels associated with surface contamination resulting from beta-gamma emitters should not exceed 0.2 mrad/h and 1.0 mrad/h, respectively, at 1 cm.

[i]The maximum contamination level applies to an area of not more than 100 cm^2.

[j]The amount of removable radioactive material per 100 cm^2 of surface area should be determined by wiping that area with dry filter or soft absorbent paper, applying moderate pressure, and measuring the amount of radioactive material on the wipe with an appropriate instrument of known efficiency. When removable contamination on objects of surface area less than 100 cm^2 is determined, the activity per unit area should be based on the actual area and the entire surface should be wiped. The numbers in this column are maximum amounts.

3.0 HEALTH AND SAFETY PLAN

BNI is responsible for protecting the health of personnel assigned to work at the site. As such, all subcontractors and their personnel are required to comply with the provisions of the applicable project instructions cited in this section or as directed by the on-site BNI representative.

3.1 SUBCONTRACTOR TRAINING

Before the start of work, all subcontractor personnel attend an orientation session presented by the BNI representative to explain the nature of the material to be encountered in the work and the required personnel monitoring and safety measures.

3.2 SAFETY REQUIREMENTS

Subcontractor personnel must comply with the following BNI requirements.

- Bioassay - Subcontractor personnel submit bioassay samples before or at the beginning of on-site activity, upon completion of the activity, and periodically during site activities as requested by BNI.
- Protective Clothing/Equipment - Subcontractor personnel are required to wear the protective clothing/equipment specified in the subcontract or as directed by the BNI representative.
- Dosimetry - Subcontractor personnel are required to wear, and return daily, the dosimeters and monitors issued by BNI.
- Controlled Area Access/Egress - Subcontractor personnel and equipment entering areas wherein access and egress are controlled for radiation and/or chemical safety purposes are surveyed by the BNI representative for contamination before leaving those areas.
- Medical Surveillance - Upon written direction from BNI, subcontractor personnel who work in areas where hazardous chemicals might exist are given a baseline and periodic health assessment defined in BNI's Medical Surveillance Program.

Radiation and/or chemical safety surveillance of all activities related to the scope of work is under the direct supervision of personnel representing BNI.

The health physics requirements for all activities involving radiation or radioactive material are defined in Project Instruction No. 20.01, the Project Radiation Protection Manual and implementing procedures.

The industrial hygiene requirements for activities involving chemicals or chemically contaminated materials are defined in Project Instruction No. 26.00, the Environmental Hygiene Manual and implementing procedures.

Copies of these project instructions and manuals are located on-site for the use of subcontractor personnel.

4.0 FIELD RADIOLOGICAL CHARACTERIZATION PROCEDURES

A master grid was established by the surveyor; BNI's radiological support subcontractor, Thermo Analytical/Eberline (TMA/E), established a grid on individual properties. The size of the grid blocks is adjusted to adequately characterize each property. The grid origin allows the grid to be reestablished during remedial action and is correlated with the New Jersey state grid system. All data correspond to coordinates on the characterization grid. The grid and its east and north coordinates are shown on all figures of the property (Sections 4 and 5).

An initial walkover survey using unshielded gamma scintillation detectors (2-in. by 2-in. thallium-activated sodium iodide probe) to identify areas of elevated radionuclide activity was performed. Near-surface gamma measurements taken using a cone-shielded gamma scintillation detector were also used in determining areas of surface contamination. Using the shielded detector ensured that the majority of the radiation detected by the instrument originated from the ground directly beneath the unit. Shielding against lateral gamma flux, or shine, from nearby areas of contamination minimized potential sources of error in the measurements. The measurements were taken 12 in. above the ground at the intersections of 10-ft grid lines. The shielded detector was calibrated at the Technical Measurements Center (TMC) in Grand Junction, Colorado, to provide a correlation of counts per minute (cpm) to picocuries per gram (pCi/g). This calibration demonstrated that 11,000 cpm corresponds to the DOE guideline of 5 pCi/g plus local average background of 1 pCi/g for thorium-232 in surface soil contamination (Ref. 9).

A subsurface investigation was conducted to determine the depth to which the previously identified surface contamination extends and to locate subsurface contamination where there is no surface manifestation. The subsurface characterization consisted of drilling and gamma logging 29 boreholes (Figure 4-1) using either a 3-in.- or 6-in.-diameter auger bit; holes were drilled to depths

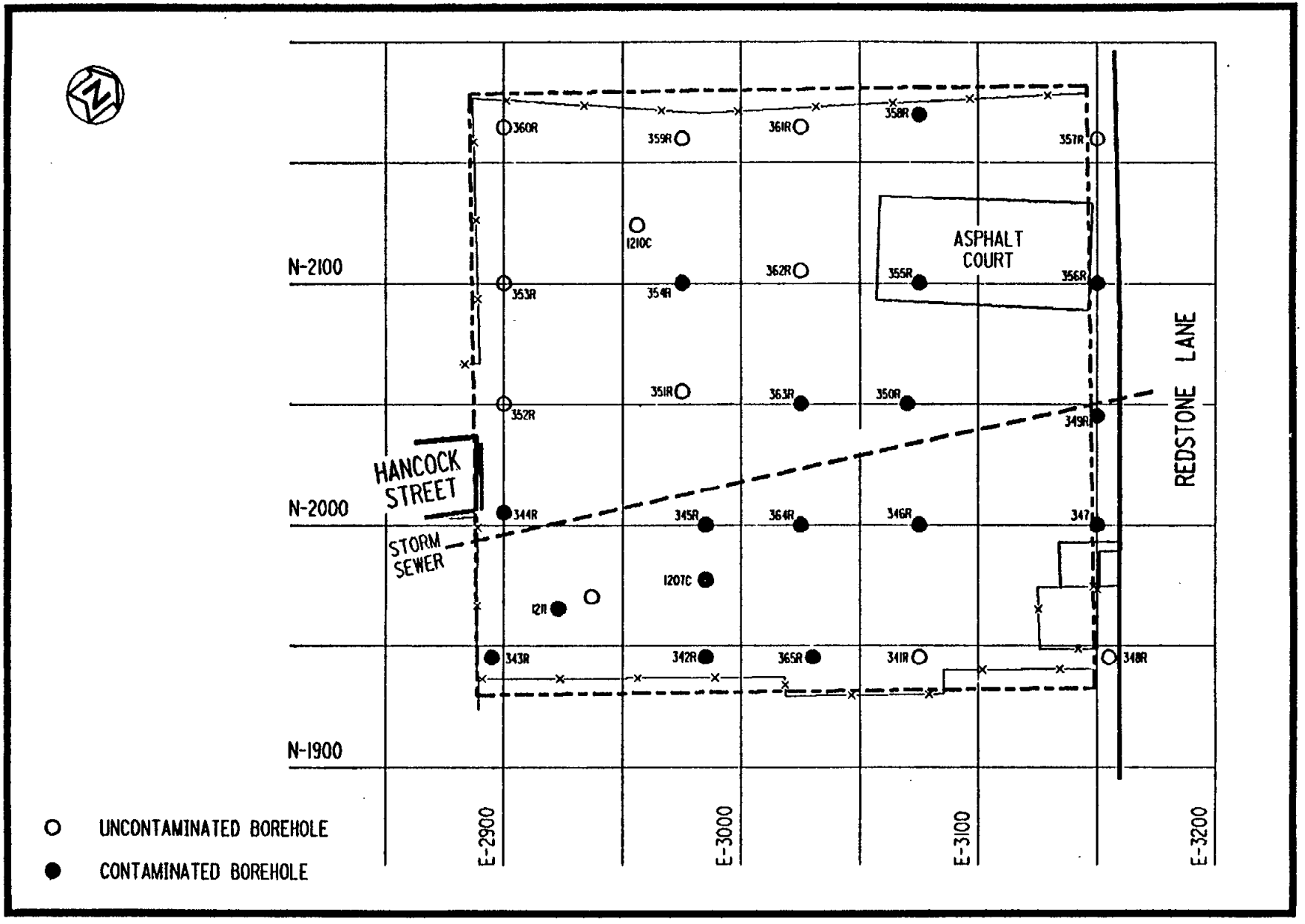

FIGURE 4-1 BOREHOLE LOCATIONS AT LODI MUNICIPAL PARK

determined in the field by the radiological and geological support representatives.

The downhole gamma logging technique was used because the procedure can be completed more quickly than collecting soil samples, and it eliminates the need for analyzing these samples in a laboratory. A 2-in. by 2-in. sodium iodide gamma scintillation detector was used to perform the downhole logging. The instrument was calibrated at TMC where it was determined that a count rate of approximately 40,000 cpm corresponds to the 15-pCi/g subsurface contamination guideline for thorium-232. This relationship has also been corroborated in results from previous characterizations where thorium-232 was found (Ref. 9).

Gamma radiation measurements were taken at 6-in. vertical intervals, and determined the depth and concentration of the contamination. The gamma logging data were reviewed to identify trends, regardless of whether concentrations exceeded the guidelines.

To identify surface areas where the level of contamination exceeded the DOE guideline of 5 pCi/g for thorium-232, areas with measurements of more than 11,000 cpm were plotted. These data as well as data from previous surveys (Refs. 5, 6, 7, and 8) were used to determine the areas of contamination.

Exterior gamma exposure rate measurements were made at 11 locations throughout the property grid system using either a 2-in. by 2-in. thallium-activated sodium iodide gamma scintillation detector used to detect gamma radiation only, or a pressurized ionization chamber (PIC) (Figure 4-2). The PIC instrument has a response to gamma radiation that is proportional to exposure in roentgens. A conversion factor for gamma scintillation to the PIC was established through a correlation of these two measurements at four locations in the vicinity of the property. The unshielded gamma scintillation detector readings were then used to estimate gamma exposure rates for each location. These measurements were taken 3 ft above the

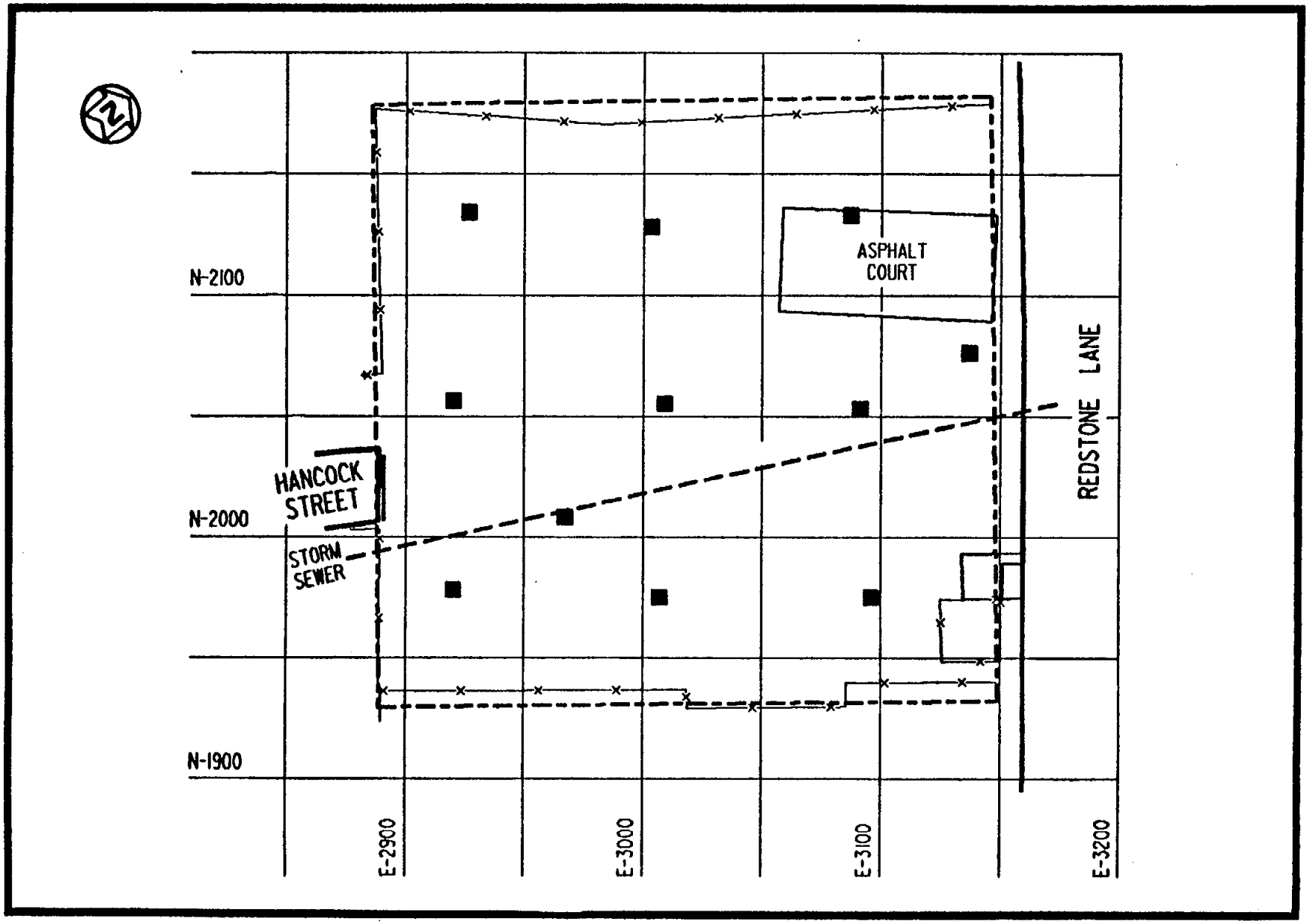

FIGURE 4-2 EXPOSURE RATE MEASUREMENT LOCATIONS AT LODI MUNICIPAL PARK

ground, and the locations were determined to be representative of the entire property. Interior measurements are generally obtained with the gamma scintillation instrument rather than the PIC because of its smaller size and the desire to minimize the technician's time inside the residence.

5.0 FIELD RADIOLOGICAL CHARACTERIZATION RESULTS

Near-surface gamma radiation measurements on the property ranged from 5,000 cpm to approximately 157,000 cpm. The average background level for this area is 5,000 cpm. A measurement of 11,000 cpm is approximately equal to the DOE guideline for thorium-232 of 5 pCi/g above background for surface soil contamination. Using this correlation, the near-surface gamma measurements were used to determine the extent of surface contamination.

On the basis of near-surface gamma radiation measurements and downhole gamma logging, contamination of this property consists of surface and subsurface contamination (Figures 5-1 and 5-2). Contamination ranges from the surface to 7 ft in depth and appears to trend off the property in the direction of Redstone Lane and Hancock Street, apparently following the route of the former Lodi Brook stream channel. Downhole gamma logging data ranged from 9,000 to 269,000 cpm; these data are presented in Table 5-1.

The vertical and horizontal limits of contamination as determined by this characterization effort are being evaluated to determine the volume of contaminated material that will require remedial action. To develop this estimate, BNI will consider the location of the contamination, construction techniques, and safety procedures.

Exterior gamma radiation exposure rate measurements ranged from 9 to 82 μR/h, including background. One of the 11 measurements exceeds the DOE guideline of 100 mrem/yr for public exposure. This is based on the assumption of 6 hours per day occupancy for 365 days per year (2,190 hours) and subtracting average background of 9 μR/h (Ref. 10). The highest measurement, 82 μR/h, was taken in the southeast area of the park where elevated near-surface gamma levels were also detected. These results can be found in Table 5-2.

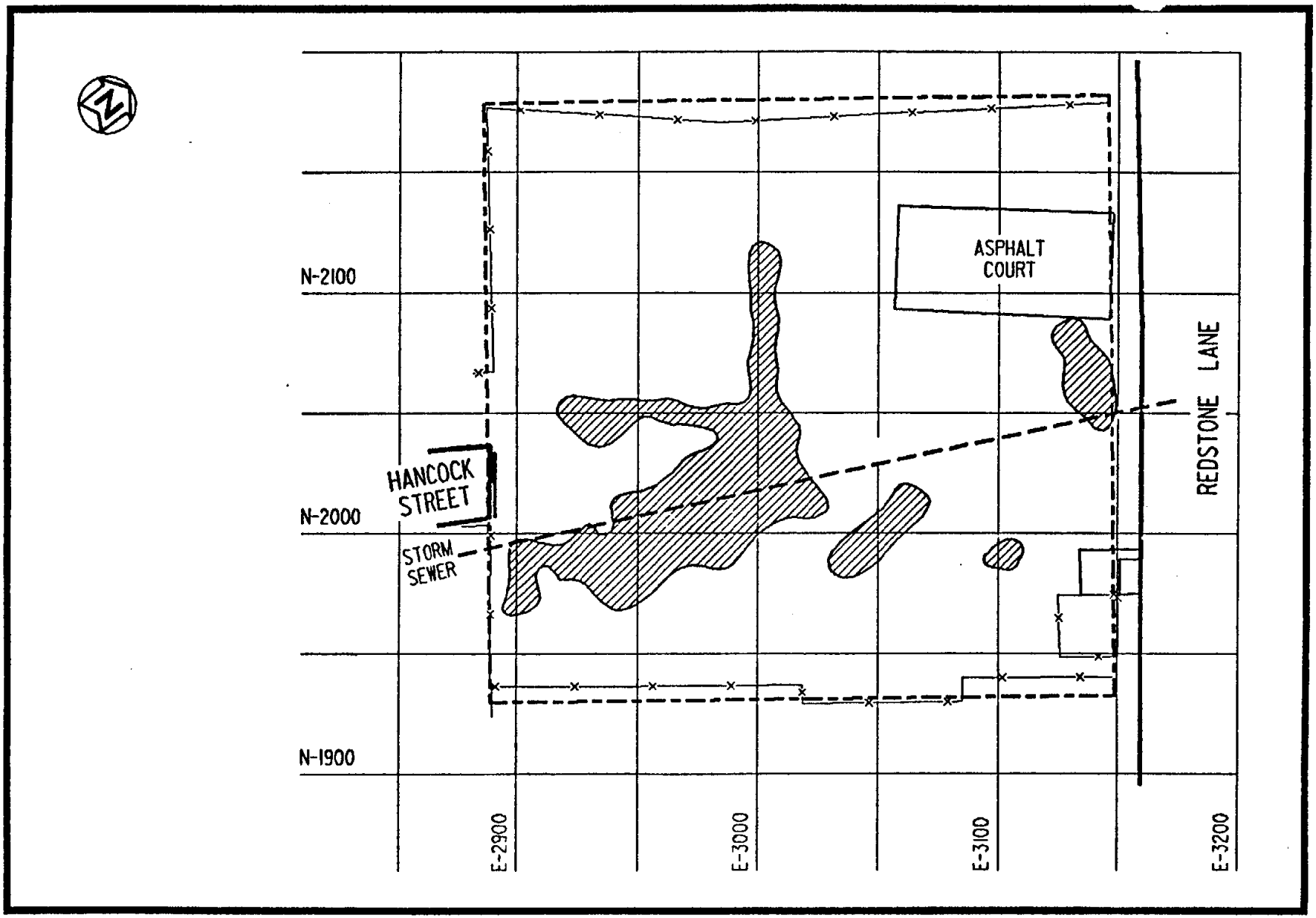

FIGURE 5-1 AREAS OF SURFACE CONTAMINATION AT LODI MUNICIPAL PARK

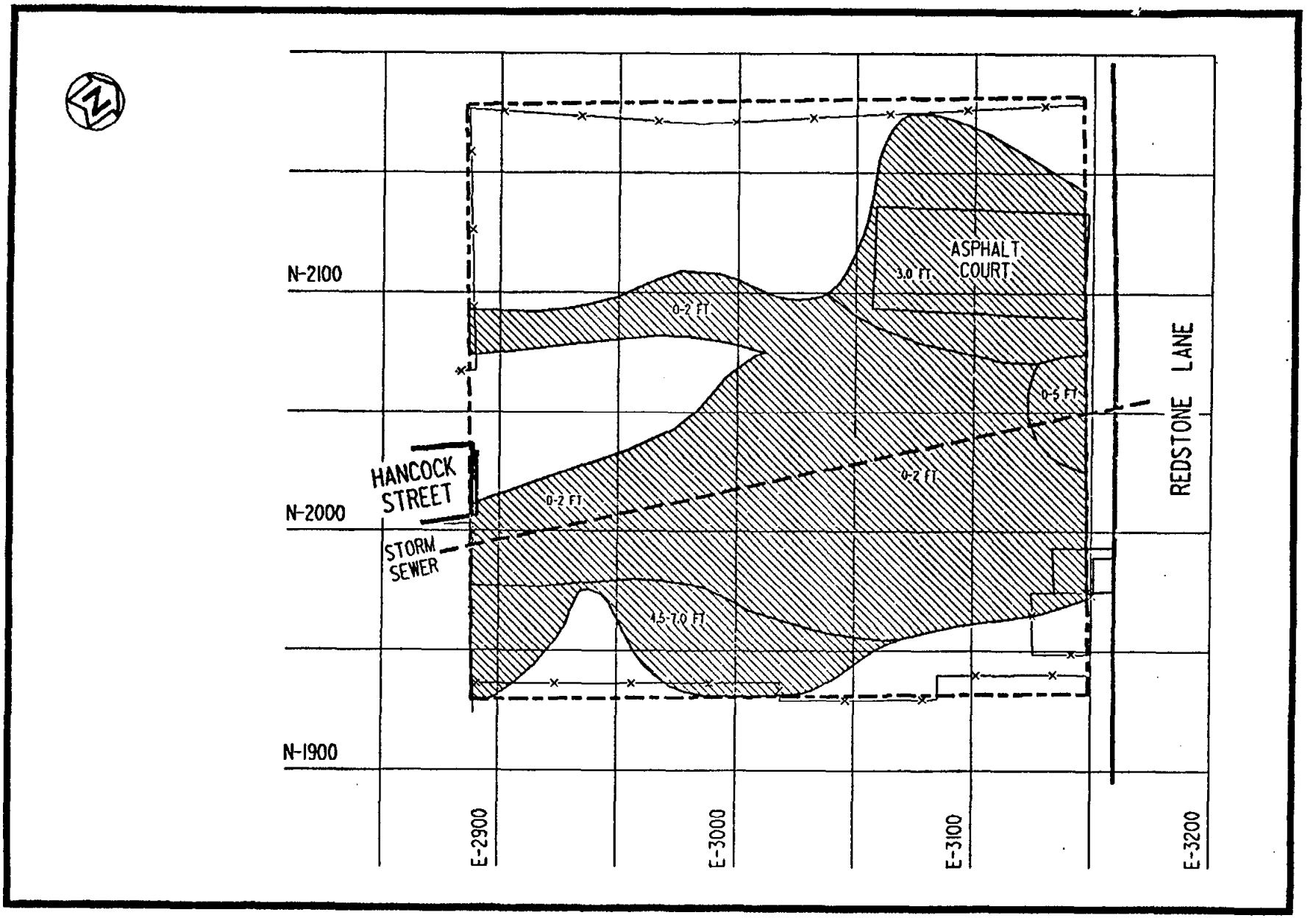

FIGURE 5-2 AREAS OF SUBSURFACE CONTAMINATION AT LODI MUNICIPAL PARK

TABLE 5-1

DOWNHOLE GAMMA LOGGING RESULTS

FOR LODI MUNICIPAL PARK[a]

Coordinates East	Coordinates North	Depth[b] (ft)	Count Rate[c] (cpm)
Borehole 341R[d]			
3075	1945	0.5	17000
3075	1945	1.0	18000
3075	1945	1.5	18000
3075	1945	2.0	19000
3075	1945	2.5	22000
3075	1945	3.0	21000
3075	1945	3.5	21000
3075	1945	4.0	21000
3075	1945	4.5	20000
3075	1945	5.0	20000
3075	1945	5.5	16000
3075	1945	6.0	13000
3075	1945	6.5	12000
Borehole 342R[d]			
2985	1945	0.5	16000
2985	1945	1.0	19000
2985	1945	1.5	21000
2985	1945	2.0	21000
2985	1945	2.5	22000
2985	1945	3.0	22000
2985	1945	3.5	21000
2985	1945	4.0	23000
2985	1945	4.5	23000
2985	1945	5.0	28000
2985	1945	5.5	45000
2985	1945	6.0	44000
2985	1945	6.5	22000
Borehole 343R			
2895	1945	0.5	12000
2895	1945	1.0	14000
2895	1945	1.5	19000
2895	1945	2.0	21000
2895	1945	2.5	22000
2895	1945	3.0	22000
2895	1945	3.5	25000

TABLE 5-1
(continued)

Coordinates East	Coordinates North	Depth[b] (ft)	Count Rate[c] (cpm)
Borehole 343R (continued)			
2895	1945	4.0	27000
2895	1945	4.5	29000
2895	1945	5.0	27000
2895	1945	5.5	32000
2895	1945	6.0	57000
2895	1945	6.5	72000
2895	1945	7.0	37000
2895	1945	7.5	17000
2895	1945	8.0	15000
2895	1945	8.5	16000
2895	1945	9.0	14000
2895	1945	9.5	15000
Borehole 344R			
2900	2005	0.5	14000
2900	2005	1.0	18000
2900	2005	1.5	28000
2900	2005	2.0	32000
2900	2005	2.5	22000
2900	2005	3.0	13000
2900	2005	3.5	11000
2900	2005	4.0	11000
2900	2005	4.5	11000
2900	2005	5.0	11000
2900	2005	5.5	11000
2900	2005	6.0	10000
2900	2005	6.5	10000
2900	2005	7.0	11000
2900	2005	7.5	11000
2900	2005	8.0	10000
2900	2005	8.5	10000
2900	2005	9.0	9000
Borehole 345R			
2985	2000	0.5	24000
2985	2000	1.0	48000
2985	2000	1.5	56000
2985	2000	2.0	27000
2985	2000	2.5	19000
2985	2000	3.0	14000

TABLE 5-1
(continued)

Coordinates East	Coordinates North	Depth[b] (ft)	Count Rate[c] (cpm)
Borehole 345R (continued)			
2985	2000	3.5	13000
2985	2000	4.0	14000
2985	2000	4.5	14000
2985	2000	5.0	12000
2985	2000	5.5	11000
2985	2000	6.0	11000
2985	2000	6.5	11000
2985	2000	7.0	11000
2985	2000	7.5	10000
2985	2000	8.0	10000
2985	2000	8.5	9000
2985	2000	9.0	10000
Borehole 346R			
3075	2000	0.5	20000
3075	2000	1.0	30000
3075	2000	1.5	78000
3075	2000	2.0	134000
3075	2000	2.5	66000
3075	2000	3.0	24000
3075	2000	3.5	17000
3075	2000	4.0	13000
3075	2000	4.5	12000
3075	2000	5.0	12000
3075	2000	5.5	12000
3075	2000	6.0	10000
Borehole 347R[d]			
3150	2000	0.5	15000
3150	2000	1.0	15000
3150	2000	1.5	23000
3150	2000	2.0	30000
3150	2000	2.5	30000
3150	2000	3.0	21000
3150	2000	3.5	17000
3150	2000	4.0	22000
3150	2000	4.5	18000
3150	2000	5.0	17000
3150	2000	5.5	12000
3150	2000	6.0	10000

TABLE 5-1
(continued)

Coordinates East	Coordinates North	Depth[b] (ft)	Count Rate[c] (cpm)
Borehole 347R (continued)[d]			
3150	2000	6.5	10000
3150	2000	7.0	9000
3150	2000	7.5	10000
3150	2000	8.0	10000
3150	2000	8.5	10000
3150	2000	9.0	10000
3150	2000	9.5	9000
3150	2000	10.0	9000
Borehole 348R[d]			
3155	1945	0.5	16000
3155	1945	1.0	18000
3155	1945	1.5	21000
3155	1945	2.0	19000
3155	1945	2.5	19000
3155	1945	3.0	17000
3155	1945	3.5	15000
3155	1945	4.0	14000
3155	1945	4.5	14000
3155	1945	5.0	15000
3155	1945	5.5	17000
3155	1945	6.0	18000
3155	1945	6.5	17000
3155	1945	7.0	14000
3155	1945	7.5	12000
3155	1945	8.0	11000
3155	1945	8.5	10000
3155	1945	9.0	10000
Borehole 349R			
3150	2045	0.5	20000
3150	2045	1.0	29000
3150	2045	1.5	48000
3150	2045	2.0	57000
3150	2045	2.5	51000
3150	2045	3.0	42000
3150	2045	3.5	36000
3150	2045	4.0	24000

TABLE 5-1
(continued)

Coordinates East	Coordinates North	Depth[b] (ft)	Count Rate[c] (cpm)
Borehole 349R (continued)			
3150	2045	4.5	31000
3150	2045	5.0	59000
3150	2045	5.5	50000
3150	2045	6.0	24000
3150	2045	6.5	15000
3150	2045	7.0	11000
3150	2045	7.5	8000
3150	2045	8.0	8000
3150	2045	8.5	9000
3150	2045	9.0	9000
Borehole 350R			
3070	2050	0.5	16000
3070	2050	1.0	29000
3070	2050	1.5	51000
3070	2050	2.0	48000
3070	2050	2.5	25000
3070	2050	3.0	13000
3070	2050	3.5	11000
3070	2050	4.0	10000
3070	2050	4.5	10000
3070	2050	5.0	10000
3070	2050	5.5	10000
3070	2050	6.0	10000
3070	2050	6.5	9000
3070	2050	7.0	10000
3070	2050	7.5	10000
3070	2050	8.0	9000
3070	2050	8.5	9000
3070	2050	9.0	9000
3070	2050	9.5	9000
Borehole 351R			
2975	2055	0.5	12000
2975	2055	1.0	24000
2975	2055	1.5	21000
2975	2055	2.0	15000
2975	2055	2.5	12000
2975	2055	3.0	12000
2975	2055	3.5	12000

TABLE 5-1
(continued)

Coordinates East	Coordinates North	Depth[b] (ft)	Count Rate[c] (cpm)
Borehole 351R (continued)			
2975	2055	4.0	12000
2975	2055	4.5	13000
2975	2055	5.0	12000
Borehole 352R			
2900	2050	0.5	14000
2900	2050	1.0	15000
2900	2050	1.5	16000
2900	2050	2.0	12000
2900	2050	2.5	10000
2900	2050	3.0	10000
2900	2050	3.5	10000
2900	2050	4.0	11000
2900	2050	4.5	10000
2900	2050	5.0	11000
2900	2050	5.5	10000
2900	2050	6.0	10000
2900	2050	6.5	10000
2900	2050	7.0	10000
2900	2050	7.5	10000
2900	2050	8.0	10000
2900	2050	8.5	11000
Borehole 353R			
2900	2100	0.5	14000
2900	2100	1.0	13000
2900	2100	1.5	12000
2900	2100	2.0	11000
2900	2100	2.5	11000
2900	2100	3.0	12000
2900	2100	3.5	13000
2900	2100	4.0	12000
2900	2100	4.5	12000
Borehole 354R			
2975	2100	0.5	16000
2975	2100	1.0	23000
2975	2100	1.5	32000
2975	2100	2.0	21000

TABLE 5-1
(continued)

Coordinates East	Coordinates North	Depth[b] (ft)	Count Rate[c] (cpm)
Borehole 354R (continued)			
2975	2100	2.5	15000
2975	2100	3.0	13000
2975	2100	3.5	12000
2975	2100	4.0	11000
2975	2100	4.5	10000
2975	2100	5.0	10000
Borehole 355R			
3075	2100	0.5	12000
3075	2100	1.0	17000
3075	2100	1.5	21000
3075	2100	2.0	24000
3075	2100	2.5	4000
3075	2100	3.0	36000
3075	2100	3.5	22000
3075	2100	4.0	14000
3075	2100	4.5	13000
3075	2100	5.0	13000
3075	2100	5.5	13000
3075	2100	6.0	12000
3075	2100	6.5	13000
3075	2100	7.0	12000
3075	2100	7.5	12000
Borehole 356R			
3150	2100	0.5	15000
3150	2100	1.0	25000
3150	2100	1.5	24000
3150	2100	2.0	20000
3150	2100	2.5	21000
3150	2100	3.0	38000
3150	2100	3.5	20000
3150	2100	4.0	13000
3150	2100	4.5	11000
3150	2100	5.0	10000
3150	2100	5.5	10000
3150	2100	6.0	11000
3150	2100	6.5	12000
3150	2100	7.0	12000
3150	2100	7.5	10000

TABLE 5-1
(continued)

Coordinates East	Coordinates North	Depth[b] (ft)	Count Rate[c] (cpm)
Borehole 356R (continued)			
3150	2100	8.0	10000
3150	2100	8.5	11000
3150	2100	9.0	11000
3150	2100	9.5	9000
Borehole 357R			
3150	2160	0.5	12000
3150	2160	1.0	13000
3150	2160	1.5	15000
3150	2160	2.0	15000
3150	2160	2.5	15000
3150	2160	3.0	18000
3150	2160	3.5	17000
3150	2160	4.0	12000
3150	2160	4.5	11000
3150	2160	5.0	11000
3150	2160	5.5	10000
3150	2160	6.0	10000
Borehole 358R			
3075	2170	0.5	12000
3075	2170	1.0	16000
3075	2170	1.5	26000
3075	2170	2.0	20000
3075	2170	2.5	18000
3075	2170	3.0	17000
3075	2170	3.5	13000
3075	2170	4.0	12000
3075	2170	4.5	12000
3075	2170	5.0	11000
Borehole 359R			
2975	2160	0.5	11000
2975	2160	1.0	14000
2975	2160	1.5	13000
2975	2160	2.0	12000
2975	2160	2.5	13000
2975	2160	3.0	12000
2975	2160	3.5	13000

TABLE 5-1
(continued)

Coordinates East	Coordinates North	Depth[b] (ft)	Count Rate[c] (cpm)
Borehole 359R (continued)			
2975	2160	4.0	12000
2975	2160	4.5	12000
2975	2160	5.0	11000
Borehole 360R			
2900	2165	0.5	10000
2900	2165	1.0	10000
2900	2165	1.5	10000
2900	2165	2.0	10000
2900	2165	2.5	11000
2900	2165	3.0	11000
2900	2165	3.5	11000
2900	2165	4.0	11000
2900	2165	4.5	10000
Borehole 361R			
3025	2165	0.5	10000
3025	2165	1.0	11000
3025	2165	1.5	12000
3025	2165	2.0	15000
3025	2165	2.5	16000
3025	2165	3.0	14000
3025	2165	3.5	13000
3025	2165	4.0	12000
3025	2165	4.5	11000
Borehole 362R			
3025	2105	0.5	11000
3025	2105	1.0	13000
3025	2105	1.5	15000
3025	2105	2.0	15000
3025	2105	2.5	14000
3025	2105	3.0	15000
3025	2105	3.5	15000
3025	2105	4.0	13000
3025	2105	4.5	13000

TABLE 5-1
(continued)

Coordinates East	Coordinates North	Depth[b] (ft)	Count Rate[c] (cpm)
Borehole 363R			
3025	2050	0.5	14000
3025	2050	1.0	19000
3025	2050	1.5	36000
3025	2050	2.0	46000
3025	2050	2.5	23000
3025	2050	3.0	14000
3025	2050	3.5	11000
3025	2050	4.0	11000
3025	2050	4.5	10000
Borehole 364R[d]			
3025	2000	0.5	21000
3025	2000	1.0	27000
3025	2000	1.5	62000
3025	2000	2.0	142000
3025	2000	2.5	218000
3025	2000	3.0	269000
3025	2000	3.5	236000
3025	2000	4.0	78000
3025	2000	4.5	31000
3025	2000	5.0	20000
3025	2000	5.5	23000
Borehole 365R			
3030	1945	0.5	24000
3030	1945	1.0	25000
3030	1945	1.5	26000
3030	1945	2.0	26000
3030	1945	2.5	25000
3030	1945	3.0	27000
3030	1945	3.5	27000
3030	1945	4.0	26000
3030	1945	4.5	24000
3030	1945	5.0	19000
3030	1945	5.5	15000
3030	1945	6.0	13000
3030	1945	6.5	15000
3030	1945	7.0	13000
3030	1945	7.5	13000
3030	1945	8.0	14000

TABLE 5-1
(continued)

Coordinates East	Coordinates North	Depth[b] (ft)	Count Rate[c] (cpm)
Borehole 365R (continued)			
3030	1945	8.5	14000
3030	1945	9.0	13000
3030	1945	9.5	12000
Borehole 1207A			
2985	1977	0.5	10000
2985	1977	1.0	12000
2985	1977	1.5	12000
2985	1977	2.0	16000
2985	1977	2.5	20000
2985	1977	3.0	20000
2985	1977	3.5	21000
2985	1977	4.0	20000
2985	1977	4.5	21000
2985	1977	5.0	29000
2985	1977	5.5	62000
2985	1977	6.0	50000
2985	1977	6.5	17000
2985	1977	7.0	12000
Borehole 1210C[e]			
2956	2124	0.5	9000
2956	2124	1.0	11000
2956	2124	1.5	12000
2956	2124	2.0	13000
2956	2124	2.5	13000
2956	2124	3.0	14000
2956	2124	3.5	11000
2956	2124	4.0	11000
2956	2124	4.5	11000
2956	2124	5.0	11000
2956	2124	5.5	11000
2956	2124	6.0	11000
Borehole 1211[d]			
2923	1965	0.5	11000
2923	1965	1.0	17000
2923	1965	1.5	20000
2923	1965	2.0	51000

TABLE 5-1
(continued)

Coordinates East	Coordinates North	Depth[b] (ft)	Count Rate[c] (cpm)
Borehole 1211 (continued)[d]			
2923	1965	2.5	75000
2923	1965	3.0	45000
2923	1965	3.5	19000
2923	1965	4.0	14000
2923	1965	4.5	13000
2923	1965	5.0	12000
2923	1965	5.5	11000
2923	1965	6.0	11000
2923	1965	6.5	11000

[a]Borehole locations are shown in Figure 4-1.

[b]The variations in depths of boreholes and corresponding results given in this table are based on the boreholes penetrating the contamination or the drill reaching refusal.

[c]Instrument used was 2-in. by 2-in. thallium-activated sodium iodide gamma scintillation detector.

[d]Bottom of borehole collapsed.

[e]No geologic log is available.

TABLE 5-2

GAMMA RADIATION EXPOSURE RATES

FOR LODI MUNICIPAL PARK

Coordinates		
East	North	µR/h
2920	1978	28
2920	2056	14
2927	2134	10
2967	2008	82
3003	2128	9
3007	1975	13
3009	2055	14
3087	2133	9
3091	2053	15
3096	1975	12
3137	2076	15

Measurements include background.

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6. EG&G Energy Measurements Group. An Aerial Radiologic Survey of the Stepan Chemical Company and Surrounding Area, Maywood, New Jersey, NRC-8109, Oak Ridge, TN, September 1981.

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9. Letter, Jeff Brown, Thermo Analytical/Eberline, to Distribution. "Technical Review of Grand Junction Instrument Correlation Study," BNI CCN 035506, March 17, 1986.

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APPENDIX A

GEOLOGIC DRILL LOGS FOR LODI MUNICIPAL PARK

LODI, NEW JERSEY

GEOLOGIC DRILL LOG

PROJECT	JOB NO.	SHEET NO.	HOLE NO.
FUSRAP	14501-138	1 OF 1	341R

SITE	COORDINATES	ANGLE FROM HORIZ	BEARING
MISS-Lodi Municipal Park	N 1945; E 3075	Vertical	------

BEGUN	COMPLETED	DRILLER	DRILL MAKE AND MODEL	SIZE	OVERBURDEN	ROCK (FT.)	TOTAL DEPTH
9-18-86	9-18-86	MORETRENCH	MOBILE B-33	6"	8.0		8.0

CORE RECOVERY (FT./%)	CORE BOXES	SAMPLES	EL. TOP CASING	GROUND EL.	DEPTH/EL. GROUND WATER	DEPTH/EL. TOP OF ROCK
/				43.6	▽ /	/

SAMPLE HAMMER WEIGHT/FALL	CASING LEFT IN HOLE: DIA./LENGTH	LOGGED BY:
N/A	NONE	D. MCGRANE

SAMP. TYPE AND DIAM.	SAMP. ADV. LEN CORE	SAMPLE REC. CORE REC.	SAMPLE BLOWS "N" % CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN g.P.M	WATER PRESSURE TESTS: PRESS. p.S.I.	WATER PRESSURE TESTS: TIME IN MIN.	ELEV.	DEPTH	GRAPHICS	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
							43.6					
								5			0.0 - 8.0 FT. SILTY SAND (SM) Color stratified; mostly fine grained; soft; poorly consolidated (loose); moist. 0.0 - 2.5 FT. Moderate brown (5 YR 3/4); numerous organics in uppermost 0.5 FT. (grass roots). 2.5 - 6.0 FT. Grayish black (N2); fine - coarse grained with some rounded gravel. 6.0 - 8.0 FT. Dark yellowish brown (10 YR 4/2).	Borehole drilled 0 - 8.0 ft. using 6" hollow-stem augers. Site checked for radioactive contamination and hole gamma-logged by Eberline-TMA, Corp.
							35.6				Bottom of boring at 8.0 ft. Hole was backfilled with the auger spoils, 9-18-86.	No ground water observed. Description and classification of soil samples by visual examination.

SS = SPLIT SPOON; ST = SHELBY TUBE; D = DENNISON; P = PITCHER; O = OTHER

SITE: MISS-Lodi Municipal Park

HOLE NO. 341R

GEOLOGIC DRILL LOG

PROJECT	JOB NO.	SHEET NO.	HOLE NO.
FUSRAP	14501-138	1 OF 1	342R

SITE	COORDINATES	ANGLE FROM HORIZ	BEARING
MISS-Lodi Municipal Park	N 1945; E 2985	Vertical	------

BEGUN	COMPLETED	DRILLER	DRILL MAKE AND MODEL	SIZE	OVERBURDEN	ROCK (FT.)	TOTAL DEPTH
9-18-86	9-18-86	MORETRENCH	MOBILE B-33	6"	8.0		8.0

CORE RECOVERY (FT./%)	CORE BOXES	SAMPLES	EL. TOP CASING	GROUND EL.	DEPTH/EL. GROUND WATER	DEPTH/EL. TOP OF ROCK
/				42.3	▽ / ▼ /	/

SAMPLE HAMMER WEIGHT/FALL	CASING LEFT IN HOLE: DIA./LENGTH	LOGGED BY:
N/A	NONE	D. MCGRANE

SAMP. TYPE AND DIAM.	SAMP. ADV. LEN CORE	SAMPLE REC. CORE REC.	SAMPLE BLOWS "N" % CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN G.P.M	WATER PRESSURE TESTS: PRESS. P.S.I.	WATER PRESSURE TESTS: TIME IN MIN.	ELEV.	DEPTH	GRAPHICS	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
							42.3				0.0 - 8.0 FT. SILTY SAND (SM) Color stratified; mostly fine grained; soft; poorly consolidated (loose); moist. 0.0 - 2.5 FT. Moderate brown (5 YR 3/4); numerous organics in uppermost 0.5 FT. (grass roots). 2.5 - 7.0 FT. Grayish black (N2); fine - coarse grained with some rounded gravel.	Borehole drilled 0 - 8.0 ft. using 6" hollow-stem augers.
								5				Site checked for radioactive contamination and hole gamma-logged by Eberline-TMA, Corp.
							34.3				7.0 - 8.0 FT. Dark yellowish brown (10 yr 4/2)	
											Bottom of boring at 8.0 ft. Auger spoils were replaced in the hole, 9-18-86.	No ground water observed.
												Description and classification of soil samples by visual examination.

SS = SPLIT SPOON; ST = SHELBY TUBE; D = DENNISON; P = PITCHER; O = OTHER

SITE: MISS-Lodi Municipal Park

HOLE NO. 342R

GEOLOGIC DRILL LOG

PROJECT	JOB NO.	SHEET NO.	HOLE NO.
FUSRAP	14501-138	1 OF 1	343R

SITE	COORDINATES	ANGLE FROM HORIZ	BEARING
MISS-Lodi Municipal Park	N 1945; E 2985	Vertical	------

BEGUN	COMPLETED	DRILLER	DRILL MAKE AND MODEL	SIZE	OVERBURDEN	ROCK (FT.)	TOTAL DEPTH
9-18-86	9-18-86	MORETRENCH	MOBILE B-33	6"	9.5		9.5

CORE RECOVERY (FT./%)	CORE BOXES	SAMPLES	EL. TOP CASING	GROUND EL.	DEPTH/EL. GROUND WATER	DEPTH/EL. TOP OF ROCK
/				42.7	▽ 8.0/34.7 9-18-86 /	/

SAMPLE HAMMER WEIGHT/FALL	CASING LEFT IN HOLE: DIA./LENGTH	LOGGED BY:
N/A	NONE	D. MCGRANE

SAMP. TYPE AND DIAM.	SAMP. ADV. LEN CORE	SAMPLE REC. CORE REC.	SAMPLE BLOWS "N" % CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN G.P.M	WATER PRESSURE TESTS: PRESS. P.S.I.	WATER PRESSURE TESTS: TIME IN MIN.	ELEV.	DEPTH	GRAPHICS	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
							42.7	5			0.0 - 9.5 FT. SILTY SAND (SM) Color stratified; mostly fine grained with occasional gravel and small cobbles (0.0-4.5 FT.); poorly consolidated (loose); mostly saturated at 8.0 FT. 0.0 - 2.5 FT. Moderate brown (5 YR 3/4); numerous organics in uppermost 0.5 FT. (grass roots). 2.5 - 4.5 FT. Grayish black (N2). 4.5 - 9.5 FT. Dark yellowish brown (10 YR 4/2).	Borehole drilled 0 - 9.5 ft. using 6" hollow-stem augers. Site checked for radioactive contamination and hole gamma-logged by Eberline-TMA, Corp. Ground water observed, 8.0 ft., 9-18-86.
							33.2				9.5 FT. BOTTOM OF HOLE Auger spoils were immediately replaced in the hole.	Description and classification of soil samples by visual examination.

SS = SPLIT SPOON; ST = SHELBY TUBE; D = DENNISON; P = PITCHER; O = OTHER

SITE: MISS-Lodi Municipal Park

HOLE NO. 343R

GEOLOGIC DRILL LOG

PROJECT	JOB NO.	SHEET NO.	HOLE NO.
FUSRAP	14501-138	1 OF 1	344R

SITE	COORDINATES	ANGLE FROM HORIZ	BEARING
MISS-Lodi Municipal Park	N 2005; E 2900	Vertical	------

BEGUN	COMPLETED	DRILLER	DRILL MAKE AND MODEL	SIZE	OVERBURDEN	ROCK (FT.)	TOTAL DEPTH
9-18-86	9-18-86	MORETRENCH	MOBILE B-33	6"	9.5		9.5

CORE RECOVERY (FT./%)	CORE BOXES	SAMPLES	EL. TOP CASING	GROUND EL.	DEPTH/EL. GROUND WATER	DEPTH/EL. TOP OF ROCK
/				40.1	▽ 4.5/35.6 9-18-86 /	/

SAMPLE HAMMER WEIGHT/FALL	CASING LEFT IN HOLE: DIA./LENGTH	LOGGED BY:
N/A	NONE	D. MCGRANE

SAMP. TYPE AND DIAM.	SAMP. ADV. LEN CORE	SAMPLE REC. CORE REC.	SAMPLE BLOWS "N" % CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN G.P.M	WATER PRESSURE TESTS: PRESS. P.S.I.	WATER PRESSURE TESTS: TIME IN MIN.	ELEV.	DEPTH	GRAPHICS	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
							40.1				0.0 - 9.5 FT. SILTY SAND (SM-SC). Color stratified; fine grained; soft - moderately hard; poorly consolidated (loose), but dense at depth; moist - saturated at 4.5 FT. 0.0 - 2.5 FT. Dark yellowish orange (10 YR 6/6); numerous grass roots and organics (0.0 - 0.5 FT.) 2.5 - 3.5 FT. Grayish black (N2). 3.5 - 7.5 FT. Dark yellowish brown (10 YR 4/2). 7.5 - 9.5 FT. Dark reddish brown (10 YR 3/4); clayey (SC).	Borehole drilled 0 - 9.5 ft. using 6" hollow-stem augers. Site checked for radioactive contamination and hole gamma-logged by Eberline-TMA, Corp. Ground water observed, 4.5 ft., 9-18-86.
								5				
							30.6				Bottom of boring at 9.5 ft. Auger spoils were replaced in the hole, 9-18-86.	

Description and classification of soil samples by visual examination.

SS = SPLIT SPOON; ST = SHELBY TUBE; D = DENNISON; P = PITCHER; O = OTHER

SITE: MISS-Lodi Municipal Park

HOLE NO.: 344R

GEOLOGIC DRILL LOG

PROJECT	JOB NO.	SHEET NO.	HOLE NO.
FUSRAP	14501-138	1 OF 1	345R

SITE	COORDINATES	ANGLE FROM HORIZ	BEARING
MISS-Lodi Municipal Park	N 2000; E 2985	Vertical	------

BEGUN	COMPLETED	DRILLER	DRILL MAKE AND MODEL	SIZE	OVERBURDEN	ROCK (FT.)	TOTAL DEPTH
9-18-86	9-18-86	MORETRENCH	MOBILE B-33	6"	9.5		9.5

CORE RECOVERY (FT./%)	CORE BOXES	SAMPLES	EL. TOP CASING	GROUND EL.	DEPTH/EL. GROUND WATER	DEPTH/EL. TOP OF ROCK
/				39.0	▽ 7.0/32.0 9-18-86 /	/

SAMPLE HAMMER WEIGHT/FALL	CASING LEFT IN HOLE: DIA./LENGTH	LOGGED BY:
N/A	NONE	D. MCGRANE

SAMP. TYPE AND DIAM.	SAMP. ADV. LEN CORE	SAMPLE REC. CORE REC.	SAMPLE "N" BLOWS % CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN G.P.M	WATER PRESSURE TESTS: PRESS. P.S.I.	WATER PRESSURE TESTS: TIME IN MIN.	ELEV.	DEPTH	GRAPHICS	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
							39.0				0.0 - 9.5 FT. SILTY SAND (SM - SC) Color stratified; fine - medium grained; soft; poorly consolidated (loose); moist - saturated at 7.0 FT. 0.0 - 2.0 FT. Dark yellowish brown (10 YR 4/2) 2.0 - 2.5 FT. Moderate brown (5 YR 3/4); numerous 0.5" pieces of gravel. 2.5 - 5.0 FT. Dark yellowish orange (10 YR 6/6); clayey (SC). 5.0 - 9.5 FT. Dark reddish brown mottled with dark yellowish brown; clayey (SC).	Borehole drilled 0 - 9.5 ft. using 6" hollow-stem augers.
								5				Site checked for radioactive contamination and hole gamma-logged by Eberline-TMA, Corp.
												Ground water observed, 7.0 ft., 9-18-86.
							29.5				Bottom of boring at 9.5 ft. Auger spoils were replaced in the hole, 9-18-86.	
												Description and classification of soil samples by visual examination.

SS = SPLIT SPOON; ST = SHELBY TUBE; D = DENNISON; P = PITCHER; O = OTHER

SITE: MISS-Lodi Municipal Park

HOLE NO. 345R

GEOLOGIC DRILL LOG

PROJECT	JOB NO.	SHEET NO.	HOLE NO.
FUSRAP	14501-138	1 OF 1	346R

SITE	COORDINATES	ANGLE FROM HORIZ	BEARING
MISS-Lodi Municipal Park	N 2000; E 3075	Vertical	------

BEGUN	COMPLETED	DRILLER	DRILL MAKE AND MODEL	SIZE	OVERBURDEN	ROCK (FT.)	TOTAL DEPTH
9-18-86	9-18-86	MORETRENCH	MOBILE B-33	6"	6.0		6.0

CORE RECOVERY (FT./%)	CORE BOXES	SAMPLES	EL. TOP CASING	GROUND EL.	DEPTH/EL. GROUND WATER	DEPTH/EL. TOP OF ROCK
/				39.7	▽ 3.0/36.7 9-18-86 ▽ /	/

SAMPLE HAMMER WEIGHT/FALL	CASING LEFT IN HOLE: DIA./LENGTH	LOGGED BY:
N/A	NONE	D. MCGRANE

SAMP. TYPE AND DIAM.	SAMP. ADV. LEN CORE	SAMPLE REC. CORE REC.	SAMPLE BLOWS "N" % CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN G.P.M	WATER PRESSURE TESTS: PRESS. P.S.I.	WATER PRESSURE TESTS: TIME IN MIN.	ELEV.	DEPTH	GRAPHICS	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
							39.7				0.0 - 6.0 FT. SILTY SAND (SM - SC). Color stratified; fine - medium grained; soft - moderately hard; poorly consolidated (loose), but dense at depth; moist - saturated at 3.0 FT. 0.0 - 1.5 FT. Dark yellowish brown (10 YR 4/2) 1.5 - 2.5 FT. Moderate brown (5 YR 3/4). 2.5 - 4.0 FT. Dark reddish brown (10 R 3/4); very silty. 4.0 - 4.5 FT. Moderate brown. 4.5 - 6.0 FT. Dark reddish brown (10 R 3/4) mottled with zones of dark yellowish brown; occasional cobble.	Borehole drilled 0 - 6.0 ft. using 6" hollow-stem augers.
								▽				
								5				
							33.7					Site checked for radioactive contamination and hole gamma-logged by TMA-Eberline, Corp. Ground water observed, 3.0 ft., 9-18-86.
											Bottom of boring at 6.0 ft. Borehole backfilled with auger spoils, 9-18-86.	6.0 ft., auger refusal; cobble?
												Description and classification of soil samples by visual examination.

SS = SPLIT SPOON; ST = SHELBY TUBE; D = DENNISON; P = PITCHER; O = OTHER

SITE: MISS-Lodi Municipal Park

HOLE NO. 346R

GEOLOGIC DRILL LOG

PROJECT	JOB NO.	SHEET NO.	HOLE NO.
FUSRAP	14501-138	1 OF 1	348R

SITE	COORDINATES	ANGLE FROM HORIZ	BEARING
MISS-Lodi Municipal Park	N 1945; E 3155	Vertical	------

BEGUN	COMPLETED	DRILLER	DRILL MAKE AND MODEL	SIZE	OVERBURDEN	ROCK (FT.)	TOTAL DEPTH
9-19-86	9-19-86	MORETRENCH	MOBILE B-33	6"	10.0		10.0

CORE RECOVERY (FT./%)	CORE BOXES	SAMPLES	EL. TOP CASING	GROUND EL.	DEPTH/EL. GROUND WATER	DEPTH/EL. TOP OF ROCK
/				44.0	/	/

SAMPLE HAMMER WEIGHT/FALL	CASING LEFT IN HOLE: DIA./LENGTH	LOGGED BY:
N/A	NONE	D. MCGRANE

SAMP. TYPE AND DIAM.	SAMP. ADV. LEN CORE	SAMPLE REC. CORE REC.	SAMPLE BLOWS "N" % CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN G.P.M	WATER PRESSURE TESTS: PRESS. P.S.I.	WATER PRESSURE TESTS: TIME IN MIN.	ELEV.	DEPTH	GRAPHICS	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
							44.0				0.0 - 10.0 FT. SILTY SAND (SM - SC) Color stratified; fine - medium grained; soft; poorly consolidated (loose); moist. 0.0 - 0.5 FT. Dark yellowish brown (10 YR 4/2); numerous grass roots and organics. 0.5 - 2.0 FT. Moderate brown (5 YR 3/4). 2.0 - 7.0 FT. Grayish black (N2); contains a few pieces of glass; numerous organics; clayey (SC).	Borehole drilled 0 - 10.0 ft. using 6" hollow-stem augers.
								5			7.0 - 10.0 FT. Dark yellowish brown.	Site checked for radioactive contamination and hole gamma-logged by Eberline-TMA, Corp. No ground water observed.
							34.0	10			Bottom of boring at 10.0 ft. Auger spoils were replaced in the hole, 9-19-86.	
												Description and classification of soil samples by visual examination.

SS = SPLIT SPOON; ST = SHELBY TUBE; O = DENNISON; P = PITCHER; O = OTHER

SITE: MISS-Lodi Municipal Park

HOLE NO. 348R

GEOLOGIC DRILL LOG

PROJECT	JOB NO.	SHEET NO.	HOLE NO.
FUSRAP	14501-138	1 OF 1	349R

SITE	COORDINATES	ANGLE FROM HORIZ	BEARING
MISS-Lodi Municipal Park	N 2045; E 3150	Vertical	------

BEGUN	COMPLETED	DRILLER	DRILL MAKE AND MODEL	SIZE	OVERBURDEN	ROCK (FT.)	TOTAL DEPTH
)-19-86	9-19-86	MORETRENCH	MOBILE B-33	6"	9.5		9.5

CORE RECOVERY (FT./%)	CORE BOXES	SAMPLES	EL. TOP CASING	GROUND EL.	DEPTH/EL. GROUND WATER	DEPTH/EL. TOP OF ROCK
/				40.8	▽ 5.5/35.3 9-19-86 /	/

SAMPLE HAMMER WEIGHT/FALL	CASING LEFT IN HOLE: DIA./LENGTH	LOGGED BY:
N/A	NONE	D. MCGRANE

SAMP. TYPE AND DIAM.	SAMP. ADV. LEN CORE	SAMPLE REC. CORE REC.	SAMPLE "N" BLOWS % CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN G.P.M	WATER PRESSURE TESTS: PRESS. P.S.I.	WATER PRESSURE TESTS: TIME IN MIN.	ELEV.	DEPTH	GRAPHICS	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
							40.8				0.0 - 9.5 SILTY SAND (SM) Color stratified; fine - medium grained with numerous rounded pebbles (0.0 - 0.5 FT.); soft; poorly consolidated (loose); moist - saturated at 5.5 FT. 0.0 - 4.5 FT. Moderate brown (5 YR 3/4) mottled with dark reddish brown (10 R 3/4) zones. 4.5 - 6.5 FT. Moderate brown. 6.5 - 9.5 FT. Dark yellowish brown (10 YR 4/2) mottled with dark reddish brown zones.	Borehole drilled 0 - 9.5 ft. using 6" hollow-stem augers. Site checked for radioactive contamination and hole gamma-logged by Eberline-TMA, Corp. Ground water observed, 5.5 ft., 9-19-86.
								5				
							31.3				Bottom of boring at 9.5 ft. Auger spoils were replaced in the hole, 9-19-86.	Description and classification of soil samples by visual examination.

SS = SPLIT SPOON; ST = SHELBY TUBE; D = DENNISON; P = PITCHER; O = OTHER

SITE: MISS-Lodi Municipal Park

HOLE NO. 349R

GEOLOGIC DRILL LOG

PROJECT	JOB NO.	SHEET NO.	HOLE NO.
FUSRAP	14501-138	1 OF 1	350R

SITE	COORDINATES	ANGLE FROM HORIZ	BEARING
MISS-Lodi Municipal Park	N 2050; E 3070	Vertical	------

BEGUN	COMPLETED	DRILLER	DRILL MAKE AND MODEL	SIZE	OVERBURDEN	ROCK (FT.)	TOTAL DEPTH
9-19-86	9-19-86	MORETRENCH	MOBILE B-33	6"	9.5		9.5

CORE RECOVERY (FT./%)	CORE BOXES	SAMPLES	EL. TOP CASING	GROUND EL.	DEPTH/EL. GROUND WATER	DEPTH/EL. TOP OF ROCK
/				39.5	▽ 5.0/34.5 9-19-86 /	/

SAMPLE HAMMER WEIGHT/FALL	CASING LEFT IN HOLE: DIA./LENGTH	LOGGED BY:
N/A	NONE	D. MCGRANE

SAMP. TYPE AND DIAM.	SAMP. ADV. LEN CORE	SAMPLE REC. CORE REC.	SAMPLE "N" BLOWS % CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN G.P.M	WATER PRESSURE TESTS: PRESS. P.S.I.	WATER PRESSURE TESTS: TIME IN MIN.	ELEV.	DEPTH	GRAPHICS	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
							39.5				0.0 - 9.5 FT. SILTY SAND (SM - SC) Color stratified; fine - medium grained with occasional cobble; soft; poorly consolidated (loose); dry - saturated at 5.0 FT. 0.0 - 3.0 FT. Moderate brown (5 YR 3/4); numerous rounded pebbles (0.5 - 1.0 FT.); numerous grass and tree roots. 3.0 - 6.0 FT. Dark yellowish brown (10 YR 4/2). 6.0 - 9.5 FT. Dark reddish brown (10 R 3/4); Occasional cobble; clayey (SC).	Borehole drilled 0 - 9.5 ft. using 6" hollow-stem augers. Site checked for radioactive contamination and hole gamma-logged by Eberline-TMA, Corp. Ground water observed, 5.0 ft., 9-19-86.
								5				
							30.0				Bottom of boring at 9.5 ft. Auger spoils were replaced in the hole, 9-19-86.	9.5 ft., auger refusal; cobble? Description and classification of soil samples by visual examination.

SS = SPLIT SPOON; ST = SHELBY TUBE; D = DENNISON; P = PITCHER; O = OTHER

SITE: MISS-Lodi Municipal Park

HOLE NO. 350R

GEOLOGIC DRILL LOG

PROJECT	JOB NO.	SHEET NO.	HOLE NO.
FUSRAP	14501-138	1 OF 1	351R

SITE	COORDINATES	ANGLE FROM HORIZ	BEARING
MISS-Lodi Municipal Park	N 2055; E 2975	Vertical	------

BEGUN	COMPLETED	DRILLER	DRILL MAKE AND MODEL	SIZE	OVERBURDEN	ROCK (FT.)	TOTAL DEPTH
9-19-86	9-19-86	MORETRENCH	MOBILE B-33	6"	5.0		5.0

CORE RECOVERY (FT./%)	CORE BOXES	SAMPLES	EL. TOP CASING	GROUND EL.	DEPTH/EL. GROUND WATER	DEPTH/EL. TOP OF ROCK
/				39.5	▽ / ▼ /	/

SAMPLE HAMMER WEIGHT/FALL	CASING LEFT IN HOLE: DIA./LENGTH	LOGGED BY:
N/A	NONE	D. MCGRANE

SAMP. TYPE AND DIAM.	SAMP. ADV. LEN CORE	SAMPLE REC. CORE REC.	SAMPLE "N" BLOWS % CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN G.P.M	WATER PRESSURE TESTS: PRESS. P.S.I.	WATER PRESSURE TESTS: TIME IN MIN.	ELEV.	DEPTH	GRAPHICS	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
							39.5				0.0 - 5.0 FT. SILTY SAND (SM) Color stratified; fine - medium grained; soft; poorly consolidated but dense at depth; dry - moist. 0.0 - 0.5 FT. Dark yellowish brown (10 YR 4/2); numerous grass roots and organics. 0.5 - 2.5 FT. Moderate brown (5 YR 3/4). 2.5 - 5.0 FT. Dark reddish brown (10 R 3/4) with numerous sandstone gravel, poss. decomposed sandstone.	Borehole drilled 0 - 5.0 ft. using 6" hollow-stem augers.
							34.5	5			Bottom of boring at 5.0 ft. Auger spoils were replaced in the hole, 9-19-86.	Site checked for radioactive contamination and hole gamma-logged by Eberline-TMA, Corp. No ground water observed.
												Description and classification of soil samples by visual examination.

SS = SPLIT SPOON; ST = SHELBY TUBE; D = DENNISON; P = PITCHER; O = OTHER

SITE: MISS-Lodi Municipal Park

HOLE NO. 351R

GEOLOGIC DRILL LOG

PROJECT	JOB NO.	SHEET NO.	HOLE NO.
FUSRAP	14501-138	1 OF 1	352R

SITE	COORDINATES	ANGLE FROM HORIZ	BEARING
MISS-Lodi Municipal Park	N 2050; E 2900	Vertical	------

BEGUN	COMPLETED	DRILLER	DRILL MAKE AND MODEL	SIZE	OVERBURDEN	ROCK (FT.)	TOTAL DEPTH
9-19-86	9-19-86	MORETRENCH	MOBILE B-33	6"	8.5		8.5

CORE RECOVERY (FT./%)	CORE BOXES	SAMPLES	EL. TOP CASING	GROUND EL.	DEPTH/EL. GROUND WATER	DEPTH/EL. TOP OF ROCK
/				40.4	▽ 6.0/34.4 9-19-86 /	/

SAMPLE HAMMER WEIGHT/FALL	CASING LEFT IN HOLE: DIA./LENGTH	LOGGED BY:
N/A	NONE	D. MCGRANE

SAMP. TYPE AND DIAM.	SAMP. ADV. LEN CORE	SAMPLE REC. CORE REC.	SAMPLE BLOWS "N" % CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN G.P.M	WATER PRESSURE TESTS: PRESS. P.S.I.	WATER PRESSURE TESTS: TIME IN MIN.	ELEV.	DEPTH	GRAPHICS	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
							40.4				0.0 - 8.5 FT. SILTY SAND (SM) Color stratified; fine - medium grained with occasional coarse gravel or small cobble; soft; poorly consolidated (loose); dry - saturated at 6.0 FT. depth. 0.0 - 0.5 FT. Dark yellowish brown (10 YR 4/2); numerous grass roots and organics. 0.5 - 8.5 FT. Moderate brown (5 YR 3/4) mottled with a few dark reddish brown (10 R 3/4) zones.	Borehole drilled 0 - 8.5 ft. using 6" hollow-stem augers.
								5				Site checked for radioactive contamination and hole gamma-logged by Eberline-TMA, Corp.
								▽				Ground water observed, 6.0 ft., 9-19-86.
							31.9				Bottom of boring at 8.5 ft. Auger spoils were replaced in the hole, 9-19-86.	8.5 ft., auger refusal; cobble?
												Description and classification of soil samples by visual examination.

SS = SPLIT SPOON; ST = SHELBY TUBE; D = DENNISON; P = PITCHER; O = OTHER

SITE: MISS-Lodi Municipal Park

HOLE NO. 352R

GEOLOGIC DRILL LOG

PROJECT	JOB NO.	SHEET NO.	HOLE NO.
FUSRAP	14501-138	1 OF 1	353R

SITE	COORDINATES	ANGLE FROM HORIZ	BEARING
MISS-Lodi Municipal Park	N 2100; E 2900	Vertical	------

BEGUN	COMPLETED	DRILLER	DRILL MAKE AND MODEL	SIZE	OVERBURDEN	ROCK (FT.)	TOTAL DEPTH
9-19-86	9-19-86	MORETRENCH	MOBILE B-33	6"	5.0		5.0

CORE RECOVERY (FT./%)	CORE BOXES	SAMPLES	EL. TOP CASING	GROUND EL.	DEPTH/EL. GROUND WATER	DEPTH/EL. TOP OF ROCK
/				40.3	▽ / ▼ /	/

SAMPLE HAMMER WEIGHT/FALL	CASING LEFT IN HOLE: DIA./LENGTH	LOGGED BY:
N/A	NONE	D. MCGRANE

SAMP. TYPE AND DIAM.	SAMP. ADV. LEN CORE	SAMPLE REC. CORE REC.	SAMPLE BLOWS "N" % CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN G.P.M	WATER PRESSURE TESTS: PRESS. P.S.I.	WATER PRESSURE TESTS: TIME IN MIN.	ELEV.	DEPTH	GRAPHICS	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
							40.3				0.0 - 5.0 FT. SILTY SAND (SM) Color stratified; fine - medium grained with numerous pieces of reddish brown (10 R 3/4) sandstone (0.0 - 1.0 FT.); soft; poorly consolidated (loose); moist. 0.0 - 2.5 FT. Moderate brown (5 YR 3/4). 2.5 - 5.0 FT. Dark reddish brown.	Borehole drilled 0 - 5.0 ft. using 6" hollow-stem augers.
							35.3	5			Bottom of boring at 5.0 ft. Auger spoils were replaced in the hole, 9-19-86.	Site checked for radioactive contamination and hole gamma-logged by Eberline-TMA, Corp. No ground water observed. Description and classification of soil samples by visual examination.

SS = SPLIT SPOON; ST = SHELBY TUBE; D = DENNISON; P = PITCHER; O = OTHER

SITE: MISS-Lodi Municipal Park

HOLE NO. 353R

GEOLOGIC DRILL LOG

PROJECT	JOB NO.	SHEET NO.	HOLE NO.
FUSRAP	14501-138	1 OF 1	354R

SITE	COORDINATES	ANGLE FROM HORIZ	BEARING
MISS-Lodi Municipal Park	N 2100; E 2975	Vertical	------

BEGUN	COMPLETED	DRILLER	DRILL MAKE AND MODEL	SIZE	OVERBURDEN	ROCK (FT.)	TOTAL DEPTH
9-19-86	9-19-86	MORETRENCH	MOBILE B-33	6"	5.0		5.0

CORE RECOVERY (FT./%)	CORE BOXES	SAMPLES	EL. TOP CASING	GROUND EL.	DEPTH/EL. GROUND WATER	DEPTH/EL. TOP OF ROCK
/				39.8	▽ 5.0/34.8 9-19-86	/

SAMPLE HAMMER WEIGHT/FALL	CASING LEFT IN HOLE: DIA./LENGTH	LOGGED BY:
N/A	NONE	D. MCGRANE

SAMP. TYPE AND DIAM.	SAMP. ADV. LEN CORE	SAMPLE REC. CORE REC.	SAMPLE BLOWS "N" % CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN G.P.M	WATER PRESSURE TESTS: PRESS. P.S.I.	WATER PRESSURE TESTS: TIME IN MIN.	ELEV.	DEPTH	GRAPHICS	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
							39.8				0.0 - 5.0 FT. SILTY SAND (SM) Color stratified; fine - medium grained with numerous pieces of dark reddish brown (10 R 3/4) sandstone (0.0 - 0.5 FT.); soft; poorly consolidated (loose); dry - saturated at 5.0 FT. 0.0 - 0.5 FT. Dark yellowish brown (10 YR 4/2); numerous grass roots and organics; numerous pieces of sandstone gravel; dry. 0.5 - 1.5 FT. Moderate brown (5 YR 3/4); moist. 1.5 - 5.0 FT. Dark reddish brown; moist - saturated at 5.0 FT.	Borehole drilled 0 - 5.0 ft. using 6" hollow-stem augers.
							34.8 ▽	5			Bottom of boring at 5.0 ft. Auger spoils were replaced in the hole, 9-19-86.	Site checked for radioactive contamination and hole gamma-logged by Eberline-TMA, Corp. Ground water observed, 5.0 ft., 9-19-86. Description and classification of soil samples by visual examination.

SS = SPLIT SPOON; ST = SHELBY TUBE; D = DENNISON; P = PITCHER; O = OTHER

SITE: MISS-Lodi Municipal Park

HOLE NO. 354R

GEOLOGIC DRILL LOG

PROJECT	JOB NO.	SHEET NO.	HOLE NO.
FUSRAP	14501-138	1 OF 1	356R

SITE	COORDINATES	ANGLE FROM HORIZ	BEARING
MISS-Lodi Municipal Park	N 2100; E 3150	Vertical	------

BEGUN	COMPLETED	DRILLER	DRILL MAKE AND MODEL	SIZE	OVERBURDEN	ROCK (FT.)	TOTAL DEPTH
9-19-86	9-19-86	MORETRENCH	MOBILE B-33	6"	10.0		10.0

CORE RECOVERY (FT./%)	CORE BOXES	SAMPLES	EL. TOP CASING	GROUND EL.	DEPTH/EL. GROUND WATER	DEPTH/EL. TOP OF ROCK
/				40.9	▽ 7.0/33.9 9-19-86 /	/

SAMPLE HAMMER WEIGHT/FALL	CASING LEFT IN HOLE: DIA./LENGTH	LOGGED BY:
N/A	NONE	D. MCGRANE

SAMP. TYPE AND DIAM.	SAMP. ADV. LEN CORE	SAMPLE REC. CORE REC.	SAMPLE BLOWS "N" % CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN G.P.M	WATER PRESSURE TESTS: PRESS. P.S.I.	WATER PRESSURE TESTS: TIME IN MIN.	ELEV.	DEPTH	GRAPHICS	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
							40.9				0.0 - 10.0 FT. SILTY SAND (SM) Color stratified; fine - medium grained; soft; poorly consolidated (loose); moist - saturated at 7.0 FT. depth. 0.0 - 1.5 FT. Moderate brown (5 Y/R 3/4); numerous grass roots and organics (0.0-0.5 ft.). 1.5 - 3.5 FT. Dark reddish Brown (10 R 3/4); numerous pieces of sandstone gravel. 3.5 - 4.0 FT. Pale green (5 G 7/2), very silty; fine grained. 4.0 - 10.0 FT. Dark Yellowish Brown (10 YR 4/2).	Borehole drilled 0 - 10.0 ft. using 6" hollow-stem augers. Site checked for radioactive contamination and hole gamma-logged by Eberline-TMA, Corp. Ground water observed, 7.0 ft., 9-19-86.
								5				
								▽				
							30.9	10			Bottom of borehole at 10.0 ft. Auger spoils were replaced in the hole, 9-19-86.	

Description and classification of soil samples by visual examination.

SS = SPLIT SPOON; ST = SHELBY TUBE; D = DENNISON; P = PITCHER; O = OTHER

SITE: MISS-Lodi Municipal Park

HOLE NO. 356R

GEOLOGIC DRILL LOG

PROJECT	JOB NO.	SHEET NO.	HOLE NO.
FUSRAP	14501-138	1 OF 1	357R

SITE	COORDINATES	ANGLE FROM HORIZ	BEARING
MISS-Lodi Municipal Park	N 2160; E 3150	Vertical	------

BEGUN	COMPLETED	DRILLER	DRILL MAKE AND MODEL	SIZE	OVERBURDEN	ROCK (FT.)	TOTAL DEPTH
9-19-86	9-19-86	MORETRENCH	MOBILE B-33	6"	6.0		6.0

CORE RECOVERY (FT./%)	CORE BOXES	SAMPLES	EL. TOP CASING	GROUND EL.	DEPTH/EL. GROUND WATER	DEPTH/EL. TOP OF ROCK
/				41.2	▽ / ▽ /	/

SAMPLE HAMMER WEIGHT/FALL	CASING LEFT IN HOLE: DIA./LENGTH	LOGGED BY:
N/A	NONE	D. MCGRANE

SAMP. TYPE AND DIAM.	SAMP. ADV. LEN CORE	SAMPLE REC. CORE REC.	SAMPLE BLOWS "N" % CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN G.P.M	WATER PRESSURE TESTS: PRESS. P.S.I.	WATER PRESSURE TESTS: TIME IN MIN.	ELEV.	DEPTH	GRAPHICS	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
							41.2				0.0 - 6.0 FT. SILTY SAND (SM - SC) Color stratified; fine - medium grained; soft; poorly consolidated (loose); moist. 0.0 - 3.5 FT. Dark reddish brown (10 R 3/4); numerous pieces of sandstone gravel (0.0-2.0 ft.) Numerous grass roots and organics (0.0-0.5 ft.). 3.5 - 4.0 FT. Grayish black (N2); clayey. 4.0 - 4.5 FT. Dark Yellowish Brown (10 YR 4/2). 4.5 - 6.0 FT. Dark Reddish Brown (10 R 3/4).	Borehole drilled 0 - 6.0 ft. using 6" hollow-stem augers.
								5				
							35.2				Bottom of borehole at 6.0 ft. Auger spoils were replaced in the hole, 9-19-86.	Site checked for radioactive contamination and hole gamma-logged by Eberline-TMA, Corp. No ground water observed.
												Description and classification of soil samples by visual examination.

SS = SPLIT SPOON; ST = SHELBY TUBE; D = DENNISON; P = PITCHER; O = OTHER

SITE: MISS-Lodi Municipal Park

HOLE NO.: 357R

GEOLOGIC DRILL LOG

PROJECT	JOB NO.	SHEET NO.	HOLE NO.
FUSRAP	14501-138	1 OF 1	358R

SITE	COORDINATES	ANGLE FROM HORIZ	BEARING
MISS-Lodi Municipal Park	N 2170; E 3075	Vertical	------

BEGUN	COMPLETED	DRILLER	DRILL MAKE AND MODEL	SIZE	OVERBURDEN	ROCK (FT.)	TOTAL DEPTH
9-19-86	9-19-86	MORETRENCH	MOBILE B-33	6"	5.0		5.0

CORE RECOVERY (FT./%)	CORE BOXES	SAMPLES	EL. TOP CASING	GROUND EL.	DEPTH/EL. GROUND WATER	DEPTH/EL. TOP OF ROCK
/				40.6	▽ / ▼ /	/

SAMPLE HAMMER WEIGHT/FALL	CASING LEFT IN HOLE: DIA./LENGTH	LOGGED BY:
N/A	NONE	D. MCGRANE

SAMP. TYPE AND DIAM.	SAMP. ADV. LEN CORE	SAMPLE REC. CORE REC.	SAMPLE BLOWS "N" % CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN G.P.M	WATER PRESSURE TESTS: PRESS. P.S.I.	WATER PRESSURE TESTS: TIME IN MIN.	ELEV.	DEPTH	GRAPHICS	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
							40.6				0.0 - 5.0 FT. SILTY SAND (SM - SC) Color stratified; fine - medium grained; soft; poorly consolidated (loose); moist. 0.0 - 3.5 FT. Dark reddish brown (10 R 3/4); numerous pieces of sandstone gravel (0.0-1.0 ft.) Numerous grass roots and organics (0.0-0.5 ft.). 3.5 - 4.0 FT. Grayish black (N2); clayey. Numerous roots and organics. 4.0 - 5.0 FT. Dark Yellowish Brown (10 YR 4/2).	Borehole drilled 0 - 5.0 ft. using 6" hollow-stem augers.
							35.6	5			Bottom of borehole at 5.0 ft. Auger spoils were replaced in the hole, 9-19-86.	Site checked for radioactive contamination and hole gamma-logged by Eberline-TMA, Corp. No ground water observed.
												Description and classification of soil samples by visual examination.

SS = SPLIT SPOON; ST = SHELBY TUBE; D = DENNISON; P = PITCHER; O = OTHER

SITE: MISS-Lodi Municipal Park

HOLE NO. 358R

GEOLOGIC DRILL LOG

PROJECT	JOB NO.	SHEET NO.	HOLE NO.
FUSRAP	14501-138	1 OF 1	359R

SITE	COORDINATES	ANGLE FROM HORIZ	BEARING
MISS-Lodi Municipal Park	N 2160; E 2975	Vertical	------

BEGUN	COMPLETED	DRILLER	DRILL MAKE AND MODEL	SIZE	OVERBURDEN	ROCK (FT.)	TOTAL DEPTH
9-19-86	9-19-86	MORETRENCH	MOBILE B-33	6"	5.5		5.5

CORE RECOVERY (FT./%)	CORE BOXES	SAMPLES	EL. TOP CASING	GROUND EL.	DEPTH/EL. GROUND WATER	DEPTH/EL. TOP OF ROCK
/				39.7	/	/

SAMPLE HAMMER WEIGHT/FALL	CASING LEFT IN HOLE: DIA./LENGTH	LOGGED BY:
N/A	NONE	D. MCGRANE

SAMP. TYPE AND DIAM.	SAMP. ADV. LEN CORE	SAMPLE REC. CORE REC.	SAMPLE BLOWS "N" % CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN G.P.M	WATER PRESSURE TESTS: PRESS. P.S.I.	WATER PRESSURE TESTS: TIME IN MIN.	ELEV.	DEPTH	GRAPHICS	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
							39.7					
							39.2				0.0 - 0.5 FT. SILTY SAND (SM) Dark reddish brown (10 R 3/4); fine - medium grained; soft; poorly consolidated (loose); few grass roots and organics; moist	Borehole drilled 0 - 5.5 ft. using 6" hollow-stem augers.
								5			0.5 - 5.5 FT. DECOMPOSED SANDSTONE Dark reddish brown (10 R 3/4); fine grained (argillaceous); soft - hard; poorly - well cemented; totally decomposed - highly weathered; drill spoils consist of silty sand (SM) and gravel, moist.	Site checked for radioactive contamination and hole gamma-logged by Eberline-TMA, Corp. No ground water observed.
							34.2				Bottom of borehole at 5.5 ft. Auger spoils were replaced in the hole, 9-19-86.	Auger refusal at 5.5 ft.
												Description and classification of soil samples by visual examination.

SS = SPLIT SPOON; ST = SHELBY TUBE; D = DENNISON; P = PITCHER; O = OTHER

SITE: MISS-Lodi Municipal Park

HOLE NO. 359R

GEOLOGIC DRILL LOG

PROJECT	JOB NO.	SHEET NO.	HOLE NO.
FUSRAP	14501-138	1 OF 1	360R

SITE	COORDINATES	ANGLE FROM HORIZ	BEARING
MISS-Lodi Municipal Park	N 2165; E 2900	Vertical	------

BEGUN	COMPLETED	DRILLER	DRILL MAKE AND MODEL	SIZE	OVERBURDEN	ROCK (FT.)	TOTAL DEPTH
9-22-86	9-22-86	MORETRENCH	MOBILE B-33	6"	5.0		5.0

CORE RECOVERY (FT./%)	CORE BOXES	SAMPLES	EL. TOP CASING	GROUND EL.	DEPTH/EL. GROUND WATER	DEPTH/EL. TOP OF ROCK
/				40.3	▽ /	/

SAMPLE HAMMER WEIGHT/FALL	CASING LEFT IN HOLE: DIA./LENGTH	LOGGED BY:
N/A	NONE	D. MCGRANE

SAMP. TYPE AND DIAM.	SAMP. ADV. LEN CORE	SAMPLE REC. CORE REC.	SAMPLE BLOWS "N" % CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN G.P.M	WATER PRESSURE TESTS: PRESS. P.S.I.	WATER PRESSURE TESTS: TIME IN MIN.	ELEV.	DEPTH	GRAPHICS	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
							40.3				0.0 - 5.0 FT. SILTY SAND (SM) Color stratified; fine - medium grained; soft; poorly consolidated (loose); moist. 0.0 - 1.0 FT. Moderate brown (5 YR 3/4); Numerous grass roots and organics (0.0-0.5 ft.). 1.0 - 5.0 FT. Dark yellowish brown (10 YR 4/2)	Borehole drilled 0 - 5.0 ft. using 6" hollow-stem augers.
							35.3	5			Bottom of borehole at 5.0 ft. Auger spoils were replaced in the hole, 9-22-86.	Site checked for radioactive contamination and hole gamma-logged by Eberline-TMA, Corp. No ground water observed. Description and classification of soil samples by visual examination.

SS = SPLIT SPOON; ST = SHELBY TUBE; D = DENNISON; P = PITCHER; O = OTHER

SITE: MISS-Lodi Municipal Park

HOLE NO. 360R

GEOLOGIC DRILL LOG

PROJECT	JOB NO.	SHEET NO.	HOLE NO.
FUSRAP	14501-138	1 OF 1	361R

SITE	COORDINATES	ANGLE FROM HORIZ	BEARING
MISS-Lodi Municipal Park	N 2165; E 3025	Vertical	------

BEGUN	COMPLETED	DRILLER	DRILL MAKE AND MODEL	SIZE	OVERBURDEN	ROCK (FT.)	TOTAL DEPTH
9-22-86	9-22-86	MORETRENCH	MOBILE B-33	6"	5.0		5.0

CORE RECOVERY (FT./%)	CORE BOXES	SAMPLES	EL. TOP CASING	GROUND EL.	DEPTH/EL. GROUND WATER	DEPTH/EL. TOP OF ROCK
/				39.9	▽ / ▼ /	/

SAMPLE HAMMER WEIGHT/FALL	CASING LEFT IN HOLE: DIA./LENGTH	LOGGED BY:
N/A	NONE	D. MCGRANE

SAMP. TYPE AND DIAM.	SAMP. ADV. LEN CORE	SAMPLE REC. CORE REC.	SAMPLE "N" BLOWS / % CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN G.P.M	WATER PRESSURE TESTS: PRESS. P.S.I.	WATER PRESSURE TESTS: TIME IN MIN.	ELEV.	DEPTH	GRAPHICS	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
							39.9				0.0 - 5.0 FT. SILTY SAND (SM - SC) Color stratified; fine - medium grained; soft; poorly consolidated (loose); moist. 0.0 - 1.0 FT. Moderate brown (5 YR 3/4) with numerous pieces of dark reddish brown (10 R 3/4) sandstone; Numerous grass roots and organics. 1.0 - 2.5 FT. Dark reddish brown; occasional roots. 2.5 - 3.5 FT. Pale green (5 G 7/2); clayey (SC). 3.5 - 5.0 FT. Dark Yellowish Brown (10 YR 4/2).	Borehole drilled 0 - 5.0 ft. using 6" hollow-stem augers.
							34.9	5			Bottom of borehole at 5.0 ft. Auger spoils were replaced in the hole, 9-22-86.	Site checked for radioactive contamination and hole gamma-logged by Eberline-TMA, Corp. No ground water observed.
												Description and classification of soil samples by visual examination.

SS = SPLIT SPOON; ST = SHELBY TUBE; D = DENNISON; P = PITCHER; O = OTHER

SITE: MISS-Lodi Municipal Park

HOLE NO. 361R

GEOLOGIC DRILL LOG

PROJECT	JOB NO.	SHEET NO.	HOLE NO.
FUSRAP	14501-138	1 OF 1	363R

SITE	COORDINATES	ANGLE FROM HORIZ	BEARING
MISS-Lodi Municipal Park	N 2050; E 3025	Vertical	------

BEGUN	COMPLETED	DRILLER	DRILL MAKE AND MODEL	SIZE	OVERBURDEN	ROCK (FT.)	TOTAL DEPTH
9-22-86	9-22-86	MORETRENCH	MOBILE B-33	6"	5.0		5.0

CORE RECOVERY (FT./%)	CORE BOXES	SAMPLES	EL. TOP CASING	GROUND EL.	DEPTH/EL. GROUND WATER	DEPTH/EL. TOP OF ROCK
/				39.2	▽ / /	/

SAMPLE HAMMER WEIGHT/FALL	CASING LEFT IN HOLE: DIA./LENGTH	LOGGED BY:
N/A	NONE	D. MCGRANE

SAMP. TYPE AND DIAM.	SAMP. ADV. LEN CORE	SAMPLE REC. CORE REC.	SAMPLE BLOWS "N" % CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN G.P.M	WATER PRESSURE TESTS: PRESS. P.S.I.	WATER PRESSURE TESTS: TIME IN MIN.	ELEV.	DEPTH	GRAPHICS	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
							39.2				0.0 - 5.0 FT. SILTY SAND (SM) Color stratified; fine - medium grained; soft; poorly consolidated (loose); dry - moist. 0.0 - 1.0 FT. Dark yellowish brown (10 YR 4/2); numerous pieces of mixed lithologies (FILL); numerous grass roots and organics. 1.0 - 2.5 FT. Mottled moderate brown (5 YR 3/4) and dark reddish brown (10 R 3/4);few roots, moist. 2.5 - 4.5 FT. Dark yellowish brown. 4.5 - 5.0 FT. Dark reddish brown.	Borehole drilled 0 - 5.0 ft. using 6" hollow-stem augers.
							34.2	5			Bottom of borehole at 5.0 ft. Auger spoils were replaced in the hole, 9-22-86.	Site checked for radioactive contamination and hole gamma-logged by Eberline-TMA, Corp. No ground water observed.
												Description and classification of soil samples by visual examination.

SS = SPLIT SPOON; ST = SHELBY TUBE; D = DENNISON; P = PITCHER; O = OTHER

SITE: MISS-Lodi Municipal Park

HOLE NO. 363R

GEOLOGIC DRILL LOG

PROJECT	JOB NO.	SHEET NO.	HOLE NO.
FUSRAP	14501-138	1 OF 1	364R

SITE	COORDINATES	ANGLE FROM HORIZ	BEARING
MISS-Lodi Municipal Park	N 2000; E 3025	Vertical	------

BEGUN	COMPLETED	DRILLER	DRILL MAKE AND MODEL	SIZE	OVERBURDEN	ROCK (FT.)	TOTAL DEPTH
9-22-86	9-22-86	MORETRENCH	MOBILE B-33	6"	10.0		10.0

CORE RECOVERY (FT./%)	CORE BOXES	SAMPLES	EL. TOP CASING	GROUND EL.	DEPTH/EL. GROUND WATER	DEPTH/EL. TOP OF ROCK
/				39.1	▽ 4.5/34.6 9-22-86	/

SAMPLE HAMMER WEIGHT/FALL	CASING LEFT IN HOLE: DIA./LENGTH	LOGGED BY:
N/A	NONE	D. MCGRANE

SAMP. TYPE AND DIAM.	SAMP. ADV. LEN CORE	SAMPLE REC. CORE REC.	SAMPLE BLOWS "N" % CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN G.P.M	WATER PRESSURE TESTS: PRESS. P.S.I.	WATER PRESSURE TESTS: TIME IN MIN.	ELEV.	DEPTH	GRAPHICS	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
							39.1				0.0 - 10.0 FT. SILTY SAND (SM-SC) Color stratified; fine - medium grained; soft; poorly consolidated (loose); moist - saturated at 4.5 FT. depth. 0.0 - 2.0 FT. Dark yellowish brown (10 YR 4/2); numerous grass roots and organics (0.0-0.5 ft.). 2.0 - 5.0 FT. Moderate brown (5 YR 3/4); clayey (SC), occasional thin 0.5 in. pale green (5 G 7/2) silt lense; numerous organics. 5.0 - 10.0 FT. Dark yellowish brown.	Borehole drilled 0 - 10.0 ft. using 6" hollow-stem augers. Site checked for radioactive contamination and hole gamma-logged by Eberline-TMA, Corp. Ground water observed, 4.5 ft., 9-22-86.
								5				
							29.1	10			Bottom of borehole at 10.0 ft. Auger spoils were replaced in the hole, 9-22-86.	
												Description and classification of soil samples by visual examination.

SS = SPLIT SPOON; ST = SHELBY TUBE; D = DENNISON; P = PITCHER; O = OTHER

SITE: MISS-Lodi Municipal Park

HOLE NO. 364R

GEOLOGIC DRILL LOG

PROJECT	JOB NO.	SHEET NO.	HOLE NO.
FUSRAP	14501-138	1 OF 1	365R

SITE	COORDINATES	ANGLE FROM HORIZ	BEARING
MISS-Lodi Municipal Park	N 1945; E 3030	Vertical	------

BEGUN	COMPLETED	DRILLER	DRILL MAKE AND MODEL	SIZE	OVERBURDEN	ROCK (FT.)	TOTAL DEPTH
9-22-86	9-22-86	MORETRENCH	MOBILE B-33	6"	10.0		10.0

CORE RECOVERY (FT./%)	CORE BOXES	SAMPLES	EL. TOP CASING	GROUND EL.	DEPTH/EL. GROUND WATER	DEPTH/EL. TOP OF ROCK
/				43.1	▽ / /	/

SAMPLE HAMMER WEIGHT/FALL	CASING LEFT IN HOLE: DIA./LENGTH	LOGGED BY:
N/A	NONE	D. MCGRANE

SAMP. TYPE AND DIAM.	SAMP. ADV. LEN CORE	SAMPLE REC. CORE REC.	SAMPLE BLOWS "N" % CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN G.P.M	WATER PRESSURE TESTS: PRESS. P.S.I.	WATER PRESSURE TESTS: TIME IN MIN.	ELEV.	DEPTH	GRAPHICS	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
							43.1				0.0 - 10.0 FT. SILTY SAND (SM) Color stratified; fine - medium grained; soft; poorly consolidated (loose); dry - moist. 0.0 - 0.5 FT. Dark yellowish brown (10 YR 4/2); numerous grass roots and organics. 0.5 - 1.5 FT. Moderate brown (5 YR 3/4). 1.5 - 6.0 FT. Grayish black (N2), occasional gravel.	Borehole drilled 0 - 10.0 ft. using 6" hollow-stem augers.
								5			6.0 - 6.5 FT. Dark yellowish orange (10 YR 6/6). 6.5 - 8.0 FT. Dark yellowish brown. 8.0 - 8.5 FT. Dark reddish brown (10 R 3/4). 8.5 - 10.0 FT. Mottled dark yellowish brown and moderate brown.	Site checked for radioactive contamination and hole gamma-logged by Eberline-TMA, Corp. No ground water observed.
							33.1	10			Bottom of borehole at 10.0 ft. Auger spoils were replaced in the hole, 9-22-86.	
												Description and classification of soil samples by visual examination.

SS = SPLIT SPOON; ST = SHELBY TUBE; D = DENNISON; P = PITCHER; O = OTHER

SITE: MISS-Lodi Municipal Park

HOLE NO. 365R

GEOLOGIC DRILL LOG

PROJECT	JOB NO.	SHEET NO.	HOLE NO.
FUSRAP	14501-138	1 OF 1	1207A

SITE	COORDINATES	ANGLE FROM HORIZ	BEARING
MISS-Lodi Municipal Park	N 1946; E 2939	Vertical	------

BEGUN	COMPLETED	DRILLER	DRILL MAKE AND MODEL	SIZE	OVERBURDEN	ROCK (FT.)	TOTAL DEPTH
12-8-87	12-8-87	Bechtel National	Minuteman	3"	7.0		7.0

CORE RECOVERY (FT./%)	CORE BOXES	SAMPLES	EL. TOP CASING	GROUND EL.	DEPTH/EL. GROUND WATER	DEPTH/EL. TOP OF ROCK
/		7			▽ / ▼ /	/

SAMPLE HAMMER WEIGHT/FALL	CASING LEFT IN HOLE: DIA./LENGTH	LOGGED BY:
140 lbs./18 inches	None	Richard Migues

SAMP. TYPE AND DIAM.	SAMP. ADV. LEN CORE	SAMPLE REC. CORE REC.	SAMPLE "N" BLOWS % CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN G.P.M	WATER PRESSURE TESTS: PRESS. P.S.I.	WATER PRESSURE TESTS: TIME IN MIN.	ELEV.	DEPTH	GRAPHICS	SAMPLE
SS	1.0	0.8								
SS	1.0	0.6								
SS	1.0	1.0								
SS	1.0	1.0								
SS	1.0	0.7								
SS	1.0	1.0						5		
SS	1.0	0.6								

DESCRIPTION AND CLASSIFICATION

0.0-1.3 ft. **SILTY CLAYEY SAND** (SC). Moderate brown (5YR3/4); very fine-to medium-grained with pebbles (to 1 inch).

1.3-1.9 ft. **CLAYEY SAND** (SC). Moderate reddish brown (10R4/6); fine-to medium-grained; mottled with blackish red (5R2/2) (at 1.9 ft.); Brunswick sandstone fragments (at 1.6 ft.).

1.9-2.5 ft. **SILTY SAND** (SM). Light brownish gray (5YR6/1); very fine-to medium-grained with clasts of Brunswick sandstone.

2.5-5.7 ft. **ASPHALT** (ASPHALT). Black (N1).
2.5-3.3 ft., brownish black (5YR2/1).
4.8 ft., brick fragment.

5.7-6.3 ft. **CLAY** (CL). Dark gray (N3).

6.3-6.5 ft. **SILT** (ML). Brownish gray (5YR6/1).

6.5-7.0 ft. **SAND** (S). Pale yellowish brown (10YR6/2); mottled with light brown (5YR5/6); fine-to medium-grained.

Bottom of hole at 7.0 ft. Hole grouted, 12-8-87.

NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.

Borehole drilled 0.0-7.0 ft. using 3" solid-stem augers.

Site checked for radioactive contamination and hole gamma-logged by Eberline-TMA, Corporation.

Note: The first sample was hand collected from side of hole taken in the interval 0.0-0.5 ft.

On Dec.7, 1987, borehole 1207 was drilled at N1977, E2985 to a depth of 9.0 ft. Hole was not logged except to note that 3.5-7.0 ft was black, oily spoil. No sample taken.

Description and classification of soil samples by visual examination.

SS = SPLIT SPOON; ST = SHELBY TUBE; D = DENNISON; P = PITCHER; O = OTHER

SITE: MISS-Lodi Municipal Park

HOLE NO. 1207A

GEOLOGIC DRILL LOG

PROJECT	JOB NO.	SHEET NO.	HOLE NO.
FUSRAP	14501-138	1 OF 1	1211

SITE	COORDINATES	ANGLE FROM HORIZ	BEARING
MISS-Lodi Municipal Park	N 1970; E 2437	Vertical	------

BEGUN	COMPLETED	DRILLER	DRILL MAKE AND MODEL	SIZE	OVERBURDEN	ROCK (FT.)	TOTAL DEPTH
12-8-87	12-8-87	Bechtel National	Minuteman	3"	9.0		9.0

CORE RECOVERY (FT./%)	CORE BOXES	SAMPLES	EL. TOP CASING	GROUND EL.	DEPTH/EL. GROUND WATER	DEPTH/EL. TOP OF ROCK
/		9			▽ 8.0/ 12-8-87 /	/

SAMPLE HAMMER WEIGHT/FALL	CASING LEFT IN HOLE: DIA./LENGTH	LOGGED BY:
140 lbs./18 inches	None	Richard Migues

SAMP. TYPE AND DIAM.	SAMP. ADV. LEN CORE	SAMPLE REC. CORE REC.	SAMPLE "N" BLOWS % CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN G.P.M	WATER PRESSURE TESTS: PRESS. P.S.I.	WATER PRESSURE TESTS: TIME IN MIN.	ELEV.	DEPTH	GRAPHICS	SAMPLE
SS	1.0	0.8								
SS	1.0	0.7								
SS	1.0	1.0								
SS	1.0	1.0								
SS	1.0	1.0								
SS	1.0	1.0						5		
SS	1.0	1.0								
SS	1.0	1.0								
SS	1.0	1.0								

DESCRIPTION AND CLASSIFICATION

0.0-2.4 ft. **SAND** (S). Moderate yellowish brown (10YR5/4); fine-to medium-grained.

1.9-2.4 ft., coarse- grained.

2.4-3.0 ft. **SILTY SANDY CLAY** (CL-ML). Dusky yellowish brown (10YR2/2); fine-to medium-grained.

3.0-3.3 ft. **SAND** (S). Moderate yellowish brown (10YR5/4); fine-to medium-grained.

3.3-4.0 ft. **CLAYEY SAND** (SC). Brownish gray (5YR6/2); fine-to medium-grained.

4.0-9.0 ft. **SAND** (S). Pale yellowish brown (10YR6/2); fine-to medium-grained; dark yellowish orange.
6.6-6.7 ft., clay zone.
8.2-8.4 ft., scattered well rounded small pebbles (<1/4 inch).
8.4-9.0 ft., dark yellowish orange (10YR6/6).

Bottom of hole at 9.0 ft. Hole grouted, 12-8-87.

NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.

Borehole drilled 0.0-9.0 ft. using 3" solid-stem augers.

Site checked for radioactive contamination and hole gamma-logged by Eberline-TMA, Corporation.

8.0 ft. ground water observed.

Note: The first sample was hand collected from side of hole taken in the interval 0.0-0.5 ft.

Description and classification of soil samples by visual examination.

SS = SPLIT SPOON; ST = SHELBY TUBE; D = DENNISON; P = PITCHER; O = OTHER

SITE: MISS-Lodi Municipal Park

HOLE NO. 1211