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DOE/OR/20722-175 M-045

Formerly Utilized Sites Remedial Action Program (FUSRAP) Contract No. DE-AC05-810R20722

# RADIOLOGICAL CHARACTERIZATION REPORT FOR THE LODI MUNICIPAL PARK

Lodi, New Jersey

November 1988



Bechtel National, Inc.

### 057116

# Bechtel National, Inc.

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NOV 1 5 1888

U.S. Department of Energy Oak Ridge Operations Post Office Box 2001 Oak Ridge, Tennessee 37831-8723

Attention: Peter J. Gross, Director Technical Services Division

Subject: Bechtel Job No. 14501, FUSRAP Project DOE Contract No. DE-AC05-810R20722 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.

Peter J. Gross

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

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

Very truly yours, 111555

B. W. Clemens for Project Manager - FUSRAP CONCURRENCE

BWC/skl:1750x Enclosures: As stated

cc:

R. G. Atkin, W/O J. D. Berger, ORAU (W/all enclosures) G. K. Hovey, W/O B. A. Hughlett, W/O M. R. McDougall, TMA/E (W/all enclosures) S. K. Oldham, W/O R. Rosen, EPA Region II, W/O R. E. Swaja, ORNL, W/O J. F. Wing, W/O

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

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NOVEMBER 1988

#### Prepared for

UNITED STATES DEPARTMENT OF ENERGY OAK RIDGE OPERATIONS OFFICE Under Contract No. DE-AC05-810R20722

By

N. C. Ring and S. K. Livesay Bechtel National, Inc. Oak Ridge, Tennessee

Bechtel Job No. 14501

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### ABBREVIATIONS

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cm	centimeter
cm <sup>2</sup>	square centimeter
cpm	counts per minute
dpm	disintegrations per minute
ft	foot
h	hour
in.	inch
1	liter
l/min	liters per minute
m	meter
 m	square meter
MeV	million electron volts
µR/h	microroentgens per hour
mi	mile
mi <sup>2</sup>	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
Ad	yard
yd <sup>3</sup>	cubic yards

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#### 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.

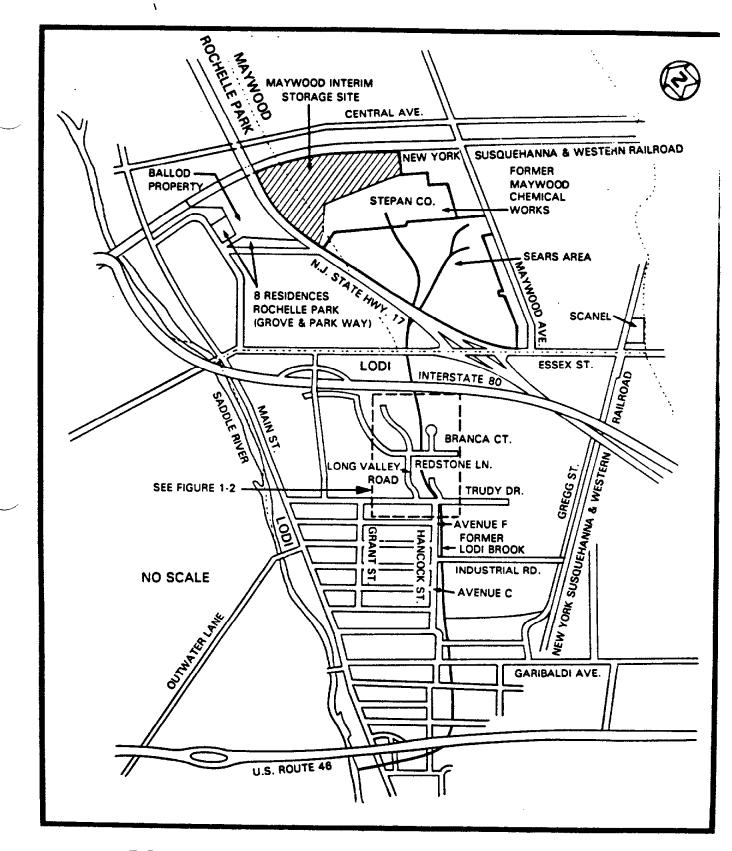


FIGURE 1-1 LOCATION OF LODI VICINITY PROPERTIES.

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#### 1.3 SUMMARY

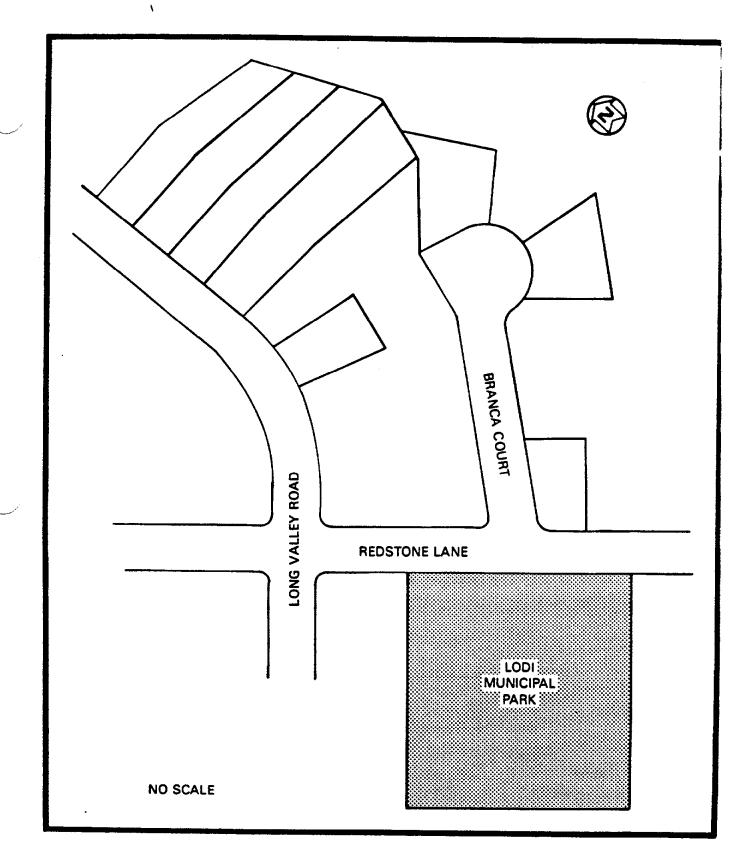
This report summarizes the procedures and results of the radiological characterization of the property at Lodi Municipal Park (Figure 1-2) in Lodi, New Jersey, conducted from September through December 1986 and three additional boreholes drilled in December 1987.

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.

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Exterior gamma radiation exposure rate measurements ranged from 9 to 82  $\mu$ R/h, including background.

#### 2.0 SITE HISTORY

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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

<u>January 1981</u> - 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<sup>2</sup> 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).

<u>June 1984</u> - 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).

<u>September 1986</u> - 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.

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#### TABLE 2-1

### SUMMARY OF RESIDUAL CONTAMINATION GUIDELINES FOR THE LODI VICINITY PROPERTIES

#### Page 1 of 2

#### BASIC DOSE LIMITS

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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<sup>a,b,c</sup>

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-cmthick 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.<sup>d</sup> 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  $\mu$ R/h.

#### Indoor/Outdoor Structure Surface Contamination

	Allowable Residual Surface Contamination <sup>e</sup> (dpm/100 cm <sup>2</sup> )		
Radionuclide	<u>Average</u> g,h	<u>Maximum</u> h,i	<u>Removable</u> 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

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(continued)

#### Page 2 of 2

	Allowable Residual Surface Contaminatione (dpm/100 cm <sup>2</sup> )		
<u>Radionuclide</u> <sup>f</sup>	<u>Average</u> g,h	<u>Maximum</u> h,i	<u>Removable</u> h,j
U-Natural, U-235, U-238, and associated decay products	5,000 a	15,000 œ	1,000 a
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

<sup>a</sup>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.

- <sup>b</sup>These guidelines represent residual concentrations above background averaged across any 15-cm-thick layer to any depth and over any contiguous 100-m<sup>2</sup> surface area.
- <sup>C</sup>Localized concentrations in excess of these limits are allowable provided that the average concentration over a 100-m<sup>2</sup> area does not exceed these limits.
- <sup>d</sup>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  $1.3 \times 10^5$  MeV of potential alpha energy.
- <sup>e</sup>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.
- <sup>f</sup>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.
- <sup>9</sup>Measurements of average contamination should not be averaged over more than  $1 \text{ m}^2$ . For objects of less surface area, the average shall be derived for each such object.
- <sup>h</sup>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.
- <sup>1</sup>The maximum contamination level applies to an area of not more than 100  $cm^2$ .
- JThe amount of removable radioactive material per  $100 \text{ cm}^2$  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  $100 \text{ cm}^2$  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

A.

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.
- O Dosimetry Subcontractor personnel are required to wear, and return daily, the dosimeters and monitors issued by BNI.
- O 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.

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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

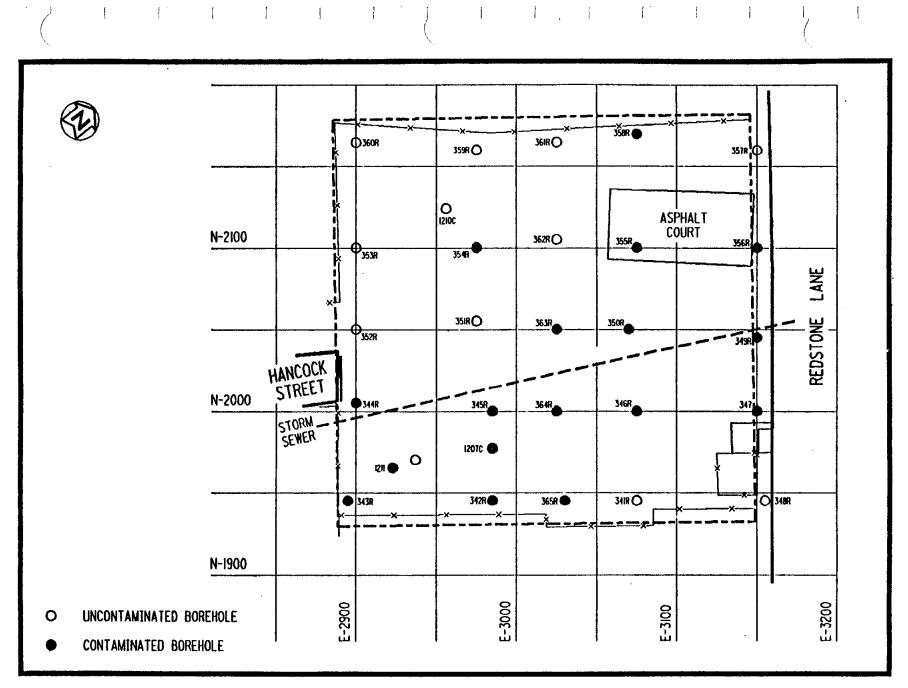


FIGURE 4-1 BOREHOLE LOCATIONS AT LODI MUNICIPAL PARK

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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 exposure rates for each location. These measurements were taken 3 ft above the

ASPHALT COURT N-2100 LANE REDSTONE HANCOCK N-2000 STORN. SEWER N-1900 E-2900 E-3000 E-3200 E-3100

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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

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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  $\mu$ R/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  $\mu$ R/h (Ref. 10). The highest measurement, 82  $\mu$ R/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.

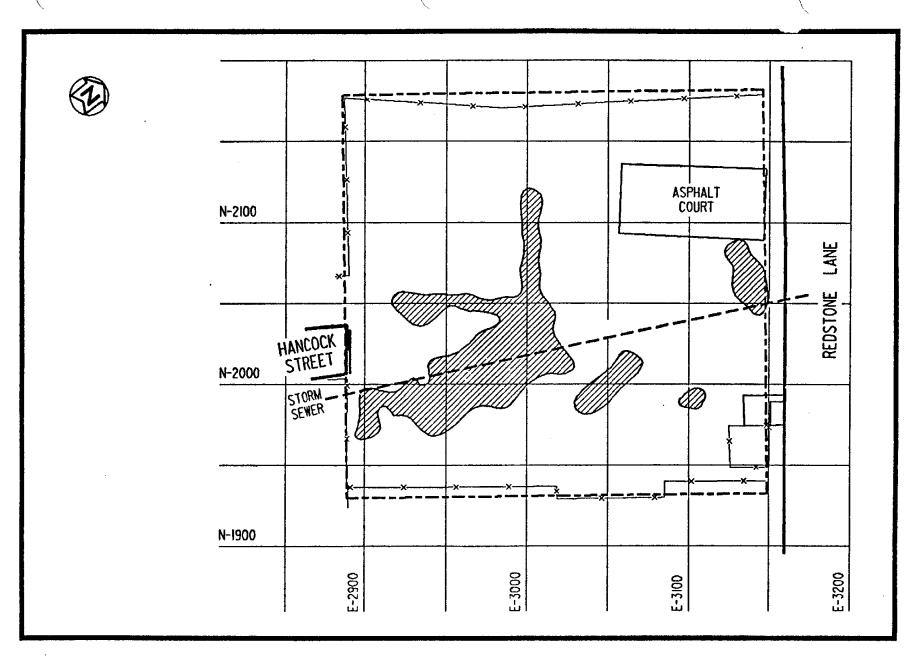
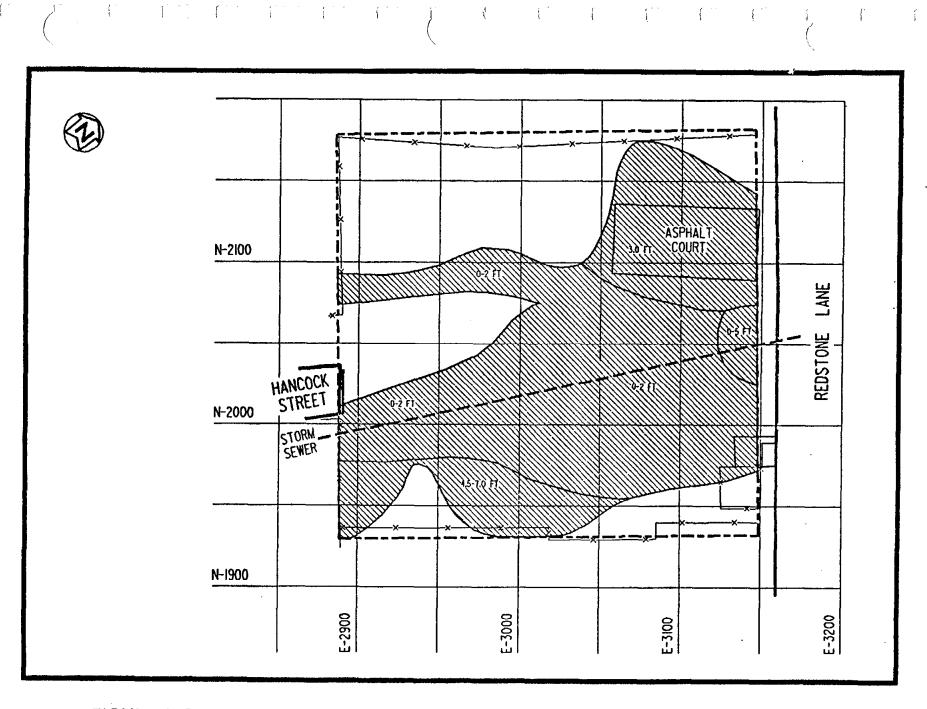


FIGURE 5-1 AREAS OF SURFACE CONTAMINATION AT LODI MUNICIPAL PARK

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

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# DOWNHOLE GAMMA LOGGING RESULTS FOR LODI MUNICIPAL PARK<sup>a</sup>

Page 1 of 12					
Coordinates		Depth <sup>b</sup>	Count Rate <sup>C</sup>		
East	North	(Ít)	(cpm)		
Borehole 34	<u>ilR</u> 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 34	12R <sup>d</sup>				
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 34	IJR				
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		

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<u>Page 2 of 12</u> <u>Coordinates</u> Depth <sup>b</sup> Count Rate <sup>c</sup>					
East:	North	Depth <sup>b</sup> (ft)	Count Rate <sup>C</sup> (cpm)		
Borehole	343R (cont	inued)			
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		
<u>Borehole</u>	<u>344R</u>				
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		
<u>Borehole</u>	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		

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Page 3 of 12						
<u>Coordi</u> East	nates North	Depth <sup>b</sup> (fr)	Count Rate <sup>C</sup> (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 2985	2000 2000	8.0 8.5	10000 <b>9</b> 000			
2985	2000	9.0	10000			
Borehole	<u>346R</u>					
3075	2000	0.5	20000			
3075	2000	1.0	30000			
3075	2000	1.5	78000			
3075	2000	2.0	134000			
3075 3075	2000 2000	2.5 3.0	66000			
3075	2000	3.5	24000 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 <sup>d</sup>						
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 3150	2000 2000	3.5 4.0	17000			
3150	2000	4.0	22000 18000			
3150	2000	5.0	17000			
3150	2000	5.5	12000			
3150	2000	6.0	10000			

# TABLE 5-1 (continued)

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Page 4 of 12							
<u>Coord</u> East	<u>inates</u> North	Depth <sup>b</sup> (ft)	Count Rate <sup>C</sup> (cpm)				
Borehole	Borehole 347R (continued) <sup>d</sup>						
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 <sup>đ</sup>						
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 7.0	17000				
3155	1945	7.5	14000				
3155	1945		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				
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Page 5 of 12							
<u>Coord</u> East	<u>inates</u> North	Depth <sup>b</sup> (ft)	Count Rate <sup>C</sup> (cpm)				
Borehole	Borehole 349R (continued)						
2010010	<u></u>	Andedy					
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				
<u>Borehole</u>	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 3070	2050 2050	9.0 9.5	9000 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				

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Page 6 of 12					
<u>Coordir</u> East	nates North	Depth <sup>b</sup> (ft)	Count Rate <sup>C</sup> (cpm)		
Borehole 3	51R (cont	inued)			
2975	2055	4.0	12000		
2975 2975	2055 2055	4.5 5.0	13000		
2975	2055	5.0	12000		
Borehole 3	<u>152R</u>				
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 5.5	11000		
2900 2900	2050 2050	5.5	10000 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 3	153R				
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 3	54R				
2975	2100	0.5	16000		
2975	2100	1.0	23000		
2975	2100	1.5	32000		
2975	2100	2.0	21000		

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Page 7 of 12					
<u>Coord</u> East	linates North	Depth <sup>b</sup> (ft)	Count Rate <sup>C</sup> (cpm)		
Borehole	e 354R (cont	inued)			
2975 2975	2100 2100	2.5 3.0	15000 13000		
2975	2100	3.5	12000		
2975 2975	2100 2100	4.0 4.5	11000 10000		
2975	2100	5.0	10000		
Borehole	<u>355R</u>				
3075	2100	0.5	12000		
3075 3075	2100	1.0	17000		
3075	2100 2100	1.5 2.0	21000 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	<u>356R</u>				
3150	2100	0.5	15000		
3150	2100	1.0	25000		
3150 3150	2100	1.5 2.0	24000		
3150	2100 2100	2.0	20000 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		

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<u>Page 8 of 12</u> <u>Coordinates</u> Depth <sup>b</sup> Count Rate <sup>6</sup>				
East	North	(ft)	(cpm)	
Borehole	356R (cont	inued)		
20101010	<u> </u>	Indedy		
3150	2100	8.0	10000	
3150	2100	8.5	11000	
3150 3150	<b>210</b> 0 <b>21</b> 00	9.0 9.5	11000 9000	
3130	2100	7.0	9000	
<u>Borehole</u>	<u>357R</u>			
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 5.5	11000	
3150 3150	<b>216</b> 0 2160	5.0	10000 10000	
<u>Borehole</u>	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	
<u>Borehole</u>	<u>359R</u>			
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	

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Page 9 of 12					
Coordinates		Depth <sup>b</sup>	Count Rate <sup>C</sup>		
East	North	(ft)	(cpm)		
Borehole 3	359R (cont	<u>inued)</u>			
2975	2160	4.0	12000		
2975	2160	4.5	12000		
2975	2160	5.0	11000		
Borehole 3	<u>360R</u>				
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 3	<u>361R</u>				
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 3	<u>862R</u>				
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

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### (continued)

<u>Page 10</u>	of_12		- <u> </u>
<u>Coord</u> East	<u>inates</u> North	Depth <sup>b</sup> (ft)	Count Rate <sup>C</sup> (cpm)
Borehole	<u>363R</u>		
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
<u>Borehole</u>	<u>364R</u> đ		
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

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## (continued)

<u>Coordi</u> East	<u>nates</u> North	Depth <sup>b</sup> (ft)	Count Rate <sup>C</sup> (cpm)
Borehole	365R (cont	inued)	
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	<u>1210C</u> 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	<u>1211</u> ª		
2923	1965	0.5	11000
2923	1965	1.0	17000
2923	1965	1.5	20000
2923	1965	2.0	51000

TABLE 5-1 (continued)

Page 12 of 12 Depthb Count Rate<sup>C</sup> Coordinates North (ft) East (cpm) Borehole 1211 (continued)<sup>d</sup> 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 1965 2923 5.0 12000 2923 1965 5.5 11000 2923 11000 1965 6.0 2923 1965 6.5 11000 aBorehole locations are shown in Figure 4-1. <sup>b</sup>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. <sup>C</sup>Instrument used was 2-in. by 2-in. thallium-activated sodium iodide gamma scintillation detector. d Bottom of borehole collapsed.

<sup>e</sup>No geologic log is available.

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#### TABLE 5-2

### GAMMA RADIATION EXPOSURE RATES

<u>     Coord</u> i		
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

#### FOR LODI MUNICIPAL PARK

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Measurements include background.

#### REFERENCES

- U.S. Department of Energy. <u>Description of the Formerly</u> <u>Utilized Sites Remedial Action Program</u>, ORO-777, Oak Ridge, TN, September 1980 (as modified by DOE in October 1983).
- Argonne National Laboratory. <u>Action Description Memorandum,</u> <u>Interim Remedial Actions at Maywood, New Jersey</u>, Argonne, IL, March 1987.

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- 3. Argonne National Laboratory. <u>Action Description Memorandum,</u> <u>Proposed 1984 Remedial Actions at Maywood, New Jersey</u>, Argonne, IL, June 8, 1984.
- Bechtel National, Inc. <u>Post-Remedial Action Report for the</u> <u>Lodi Residential Properties</u>, DOE/OR/20722-89, Oak Ridge, TN, August 1986.
- 5. NUS Corporation. <u>Radiological Study of Maywood Chemical</u>, <u>Maywood</u>, <u>New Jersey</u>, November 1983.
- EG&G Energy Measurements Group. <u>An Aerial Radiologic Survey of</u> the Stepan Chemical Company and Surrounding Area, Maywood, <u>New Jersey</u>, NRC-8109, Oak Ridge, TN, September 1981.
- 7. Oak Ridge National Laboratory. <u>Results of the Mobile Gamma</u> <u>Scanning Activities in Lodi, New Jersey</u>, ORNL/RASA-84/3, Oak Ridge, TN, October 1984.
- Oak Ridge National Laboratory. <u>Results of the Radiological</u> <u>Survey at Lodi Municipal Park, Redstone Lane (LJ032)</u>, Lodi, New Jersey, ORNL/RASA-86/32, Oak Ridge, TN, September 1986.
- 9. Letter, Jeff Brown, Thermo Analytical/Eberline, to Distribution. "Technical Review of Grand Junction Instrument Correlation Study," BNI CCN 035506, March 17, 1986.

10. Levin, S. G., R. K. Stoms, E. Kuerze, and W. Huskisson. "Summary of Natural Environmental Gamma Radiation Using a Calibrated Portable Scintillation Counter." <u>Radiological</u> <u>Health Data Report</u> 9:679-695 (1968).

#### APPENDIX A

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#### GEOLOGIC DRILL LOGS FOR LODI MUNICIPAL PARK

LODI, NEW JERSEY

-			EO	LOG	C D	RILI	L LO	G	PROJEC	T	FUSRAP 14501-138 1 OF	
	BEGU	MIS	CO	odi Mi Mpleted	DRILL	ER		ENCH			N 1945; E 3075 MAKE AND MODEL SIZE OVERBURDEN ROCK (1) OBILE B-33 6" 8.0	<u>l</u>
$\sim$	CORE	REC	OVER		) CORE	BOXE	SSAMPL	ESEL. TO		NG		TOP OF ROCK
	SAMP		1	N/A	-			NO		A./L	D. MCGRANE	
-		SAMP. ADU. LEN CORE	SAMPLE REC. CORE REC.	SAMPLE BLOWS "N" X CORE RECOVERY	LOSS IN B.P.M Jue	ATEU ESST: .I.S.d	RE	ELEV.	DEPTH	GRAPHICS		DTES ON: ATER LEVELS ATER RETURN HARACTER OF RILLING, ET
									-		stratified: mostly fine grained; soft; 8.	orehole drilled 0 0 ft. using 6" ollow-stem auger
								35.6_	5_ - -		6.0 - 8.0 FT. Dark yellowish brown (10 YR 4/2).	ite checked for adioactive ontamination and ole gamma-logge y Eberline-TMA orp.
								•				o ground water bserved.
											c	escription and assification of sc amples by visual
												kamination.
				 PDON; \$1 ; P = P1				ITE		115	-Lodi Municipal Park	DLE NO. 341R

	C	E	O	10	GI	СГ	RIL	L LC	G.	PROJE	CT	FUSRAP		JOB NO 14501		SHEET NO. 8 1 DF 1	HOLE NO.
SITE									COORDIN	TES	<u></u>	FUSKAP				E FROM HORI	
							al P	ark				N 1945; E 298			<u> </u>	Vertical	
BEGL	in 18-8	1				DRIL		DETT	RENCH			MAKE AND MODEL IOBILE B-33	SIZE 6"	OVERBURDEI	N	ROCK (FT.)	TOTAL DEF
									LESEL. TO	P CAS			H/EL. GRO		P	L EPTH/EL. TOF	
		/	/									42.3					<u>/</u>
SAMP	PLE H	AMM			GHT,	FALL	CA	SING LE			A./L	NGTH LOGGED BY:		D. MCG	יאס	VF	
ŧIJ	•1	1.	Т	<u>/A</u>	- 1		WATE	R	<u>NO</u> ]		<del>.</del>	<u></u>		D. MCG	<b>KA</b>		
DIAM.	SAMP. ADU	E	ບູ່ ແ	y <sup>z</sup>  y	문 문	Pi	RESSU	JRE		E	GRAPHICS	u				NOTES	
		Ш		i sg g	<u>3</u> <u>Š</u>	Ω_Σ	လို ၊	₩	ELEV.	DEPTH	Hd	DESCRIPTIO	DN AND C	LASSIFIC	ATI		RETURN
Sens Sens Sens Sens Sens Sens Sens Sens	БЩ	L	<u>к</u>	하ฏ	۶Щ	LOSS A.P. M	PRESS. P.S.I.	HIN NIN NIN NIN		<b>ם</b>	GR	ā					CTER OF ING, ET
ตั้งน	<u>וס</u> י_	10	-	-		- <u>c</u>			42.3		1	0.0 - 8.0 FT. S	LTY SAN	D (SM) Cold	or	Boreho	le drilled 0
											-	stratified; mo poorly conso 0.0 - 2.5 FT. numerous or	stly fine gr idated (loc	rained; soft; se); moist.	/ .	8.0 ft. hollow	using 6" -stem auge
											$\left\  \right\ $	0.0 - 2.5 FT. numerous or	Moderate ganics in uj	brown (5 Y) opermost 0.5	R 3/4 FT.	);	
											-  _	(grass roots) 2.5 - 7.0 FT. coarse graine				1	
								1		•	-  -	coarse graine	d with som	ie rounded g	ravel.		
		[							1	5_	-						ecked for
1										· ·	-					radioad contan	ination an
							·	1	7.0 - 8.0 FT.	Dark yell	owish brown	(10 y	r by Ebe	mma-logg rline-TMA			
						34.3_	1	11.1	<u>4/2)</u>				Corp. No gro e observe	und water			
												Bottom of borin replaced in t	g at 8.0 ft. he hole, 9-1	Auger spon 18-86.	is wer	e observ	ea.
					ł												
										] •							
								1									
			1														
									1								
								1		1							
					-			1									
										]							
										1							
								1									
								1									
									1								otion and
		1			1		1									sample	cation of so s by visual
																examir	nation.
SS :	1 = SPI	1 .1T	SPO	DON:	ST	= SH	LBY 1	UBE; 1	SITE							HOLE N	
								OTHER		- N	<b>IIS</b>	S-Lodi Mun	icinal	Park	١	ļ	342R

	G	EC	)L(	)Gl		DRIL	LLC	)G	PROJE	CI		FUSRAP	јов но. 14501-1	38 1		HOLI
SITE 1	MIS	S-1	iho.	M	inicij	nal P	ork	COORDIN	ATES		ľ	N 1945; E 2985	AN	GLE FR	OM HORIZ	BEAR
BEGUI	1	C	OMPLI	ETED	DRIL						LM	IAKE AND MODEL SIZE	OVERBURDEN			TOT
				3-86				RENCH	PCAS			DBILE B-33 6" OUND EL. DEPTH/EL. GRO	9.5	DEPTH	/EL. TOP	OF
	NE U	/	• •									42.7	-18-86		/	•
SAMPI	.E H.		r we N/A		/FALL	C/	SING L	EFT IN HO NO		IA./L	ENG	GTH LOGGED BY:	D. MCGR	ANF		
W	<b>.</b>					WATE RESSI	R			6	Π		<u>D. MCOR</u>		1	
Zē	COR 100		ц Ц Ц	X CORE RECOVERY		TEST	<u>\$</u>	ELEV.	DEPTH	GRAPHICS	SAMPLE	DESCRIPTION AND (	CLASSIFICA	TION	NOTES	
			N N N	200	LOSS LOSS A IN	PRESS.	HINE NINE NINE			RAP	SAM				WATER CHARAC	RE.
<b>B</b> A BA	SA	N DO	Ĩ	Ē	276		jμ. Σ	42.7	 	ō	[]_	•			DRILLI	ING.
												0.0 - 9.5 FT. <u>SILTY SAN</u> stratified; mostly fine g	ماخليس المحشا م		Borehol 9.5 ft. u	sing
										-		occasional gravel and si (0.0-4.5 FT.); poorly cc mostly saturated at 8.0 0.0 - 2.5 FT. Moderate br numerous organics in uj	nall cooples physical cooples	se);	hollow-	stem
										-		0.0 - 2.5 FT. Moderate br	rown (5 YR 3/4)	ł.		
										-		(grass roots). 2.5 - 4.5 FT. Grayish blac 4.5 - 9.5 FT. Dark yellowi	ck (N2).	••		
									5.	-1		4.5 - 9.5 FT. Dark yellow: 4/2).	ish`brówn (10 Y	R	Site che	
										-					radioact	nati
									<b> </b>	1					hole gan by Eber Corp.	nma line
								-	Ŧ	1					Ground observed	
								33.2_	-	1	$\left  \right $	9.5 FT. BOTTOM OF HC spoils were immediately	DLE Auger		9-18-86	
												spoils were immediately hole.	replaced in the	;		
	•							·								
	:															
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															Descript classifica	atio
															samples examina	by tion
							1									
 SS =	SPI 1	2 1	<u>рооч</u>	: ST	= SHI			 SITE	I	<b>_</b>	L.L.	······································			HOLE NO	•
							OTHER		N/	1159	٩.	-Lodi Municipal	Dark			43

SITE		<b>JEC</b>	DL	DG		RIL	LLC	)G	PROJE		FUSR	AP		JOB 145	01-13	8 1		HOLE
r 1		S-1	Lod	i Mı	ıniciŗ	al Pa	ark	COORDIN	ATES		N 2005; E	<b>29</b> 00	)			le fr Vert	om horiz ical	BEARIN
BEGU	N	C	OMPL	ETED	DRIL	LER					MAKE AND MC	DEL	SIZE	OVERBUR	DEN		(FT.)	TOTAL
				8-80 FT./X				RENCH	P CAS		GROUND EL.		6"	9.		FPTH	/EL. TOP	0F 80
_		_ /									40.1	14 /	/EL. GROU	18-86			/	•••••••
SAMP	LE H		r w N/.		/FALL	CA	SING LI	EFT IN HO NO		IA./L	ENGTH LOGGED	BY:		D. MC		NE		
₩.	-1m	U .				WATE								D. MC	GRA	INE	<u> </u>	*
SAMP. TY	LEN CORE	SAMPLE RE Core Rec	SAMPLE	X CORE RECOVERY	L M. T NI B. P. N	SSU SSU SSU SSU SSU SSU SSU SSU SSU SSU		ELEV.	DEPTH	GRAPHICS			n and c			ON.	NOTES WATER WATER CHARAC DRILLI	LEVE RETU TER
								30.6_	5-		(0.0 - 1) (2.5 - 3) 3.5 - 7 4/2).	tratifie tely ha but dd ed at 4 5 FT. 5 FT. 5 FT. 5 FT. 5 FT. 5 FT.	d; fine grai srd; poorly mse at dep .5 FT. Dark yello is grass roc Grayish bi Dark yello Dark redd SC).	ined; soft consolida th; moist wish oran ots and or lack (N2). wish brown ish brown	ted ge (10 ganics m (10 (10 Y)	YR R	Borehole 9.5 ft. us hollow-s Site cheer radioact contamin hole gan by Eberl Corp. Ground observed 9-18-86	check for ive nation ine-T water i, 4.5 f
									 								examinal	ion.
SS ≠ D ≠ D					= SHE		/	ITE	3.4		5-Lodi N	<b>.</b>	-:		、		HOLE NO.	44F

	Ģ	E(	OI	OG	IC D	RILI	L LO	G	PROJE	CT	FUSRAP		01-138 1		HOLE NO. 345R
SITE		<u> </u>	<b>.</b>			- ¥ 10-	11-	COORDIN	ATES		N 2000 E 2005	<b>_</b>	ANGLE FR	1	BEARING
BEGL		_	_	DI MI	DRILL		rk	1		DRILL	N 2000; E 2985		Vert	(FT.)	TOTAL DEI
9-3	18-8	6	9-	18-86	5	MO		ENCH			OBILE B-33	6" 9.	5		9.5
CORE	REC	OVE	RY ,	(FT./%	) CORE	BOXE	SSAMPL	ESEL. TO	PCAS	ING	<u> </u>	EL. GROUND WATER /32.0 9-18-86	DEPTH	/EL. TOP	OF ROCK
SAMF	LE H	/ Amm	ER	WEIGHT	/FALL	CAS	I SING LE	FT IN HO	LE: DI	A./LE	37.0		l	/	
				/ <b>A</b>			·····	NO	NE	<u> </u>		D. MC	GRANE		
Ш.	يا د	ပ္ပုံ	;		PR	JATEF ESSU				ŋ					
DIAM.	CORE		피			FESTS		ELEV.	DEPTH	GRAPHICS	DESCRIPTION	AND CLASSIF	ICATION	WATER	ON: LEVELS
ц.	SAMP.		L N N		G.P.M	PRESS.	HINE MIN.	ļ	Ü	A P				WATER	RETURN
AND SAT SAT SAT SAT SAT SAT SAT SAT SAT SAT	SA	NAS NAS	3	BLOUS "N" X CORE RECOVERY	<u>ہ</u> ۔	Å.	Ξ.4	\$9.0		ō				DRILLI	ING, ETO
											0.0 - 9.5 FT. <u>SILT</u> Color stratified;	fine - medium gr	aińed:	Borehold 9.5 ft. u	e drilled 0 sing 6"
				•				1			soft; poorly cons saturated at 7.0	olidated (loose); 1 FT.	moist -	hollow-	item auger
											<b>4</b> /2	ark yellowish brow	•	1	
											2.0 - 2.5 FT. M numerous 0.5" p 2.5 - 5.0 FT. Dark	oderate brown (5 pieces of gravel.	YR 3/4);		
									5_		6/6]; clayey (SC	<b>)</b> .			
									.		5.0 - 9.5 FT. D with dark yellow	árk reddish browr vish brown; clayey	i mottled	Site che radioact	ive
				1					¥.					hole gan	nation and nma-logge
		ļ							Ι.					Corp. Ground	line-TMA
														observed	1, 7.0 ft.,
								29.5_	1		Bottom of boring a	• 0 E ft August an	oile mens	9-18-86	•
		ŀ									replaced in the l	t 9.5 It. Auger sp hole, 9-18-86.	OIIB WEFE		
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-														Descript	ion and
														samples	ation of so by visual
									1					examina	tion.
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		ĺ													
SS =	SPL	IT :	SP0	ON; ST	= SHEI	LBY TU	BE; S	ITE	 					HOLE NO	
					TCHER;				- N	IISS	5-Lodi Munici	ipal Park	١.	3	45R

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SITE COORDINATES ANGLE FROM HORIZBEARING MISS-Lodi Municipal Park N 2000; E 3075 Vertical		G	ΕO	LOC	IC I	DRIL	L LC	)G	PROJE	CT		FUSR	۸Þ			08 NO. 501-1		TNO. OF 1	HOLE NO. 346R
GOM-ETED         DRILL BALE AND MODE         DRILL BALE AND MODE AND MODE         DRILL BALE AND MODE AND M	ITE								TES			rusk	Ar		14				
9-18-86 9-18-86 MORETRENCH MOBILE B-33 6° 6.0 6.0 6.0 ORE RECOVERT (F1.7k) CORE BORESDAMPLESEL. TOP CASING RADUE (ADDRE) 4.000 BL. DEPTH/EL. TOP OF ROCK 39.7 20.036.7 9-18-86 (ADDRE) 4.000 CL. DEPTH/EL. TOP OF ROCK 39.7 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		MIS	S-L	odi N	lunici	pal P	ark												
ORF RECOVERY (FT./%)     CORE BOXES[SAMPLESEL: TOP CASING (SOLW) EL. DEPTIVEL, DECK PARCE     DEPTIVEL, TOP OF ROCK       AMPLE HAVER MEIGNT/FALL     CASING LET IN HOLE: DIA./LEACTH LOGGE BY:     D. MCGRANE       MARCH HALL     NONE     D. MCGRANE       March Hall     PRESSURE BOILD BY:     D. MCGRANE       March Hall     PRESSURE BY 1000 MILLING, ET     D. MCGRANE       March Hall     PRESSURE BY 1000 MILLING, ET     Description and CLASSIFICATION MARCH LEVEL       March Hall     March Hall     Borr       March Hall     Borr     Sorr       March Hall     Sorr     Sorr       Sorr     Sorr     S									1						1		ROCK	(FT.)	TOTAL DEPT
AMPLE HAVEN MICHT/FALL     CASING LEFT IN HOLE: DL./LENGTH     D. MCGRANE       N/A     NONE     D. MCGRANE       N/A     NONE     D. MCGRANE       N/A     NONE     D. MCGRANE       N/A     MATER LEVELS     D. MCGRANE       N/A     MATER RETURNE     D. MCGRANE       N/A     MATER RETURNE     D.									P CAS						_		DEPTH/	FL. TOP	
AMPLE HANNER WEIGHT/FALL JASING LEFT IN HOLE DIA./LENGTH LOGGED BY: N/A NONE D. MCGRANE NONE D. MCGRANE NOTES DN: MATER LEVELS C C C C C C C C C C C C C C C C C C C	UKL	. KEU	/ UVER				LUUM				ł		<b>¥</b> 3.	0/36.7 5	P•18•86			/	
Herein and State of the second state of the secon	SAMP	LE H	AMMER	WEIGH	T/FALL	C/	SING L	EFT IN HO	LE: DI	A./L			BY:						
<ul> <li>Color stratified fine - mediately hard; poorly consolidated income to by Strationate - mediately hard; poorly consolidated income to the Strationate - mediately hard; poorly consolidated income to the Strationate - mediately strationate</li></ul>			]	N/A				NO	NE						<b>D.</b> M	ICGRA	NE		
<ul> <li>Color stratified fine - mediately hard; poorly consolidated income to by Strationate - mediately hard; poorly consolidated income to the Strationate - mediately hard; poorly consolidated income to the Strationate - mediately strationate</li></ul>	AMP. TYPE	AMP. ADU. LEN CORE	AMPLE REC.	SAMPLE BLOUS "N" X CORE	LOSS LOVENT	RESS TESI	URE 'S	ELEV.	DEPTH	GRAPHICS	SAMPLE	DESCRI	PTIO	N AND I	CLASSI	FICAT	ION	WATER WATER CHARA(	LEVELS, RETURN, CTER OF
	0					- 0.0		Ž			4	Color s soft - n (loose), saturat 0.0 - 1. 4/2) 1.5 - 2. 2.5 - 4. S/4); v 4.0 - 4. 5 - 6.0 mottlec occasio	tratified noderat but de ed at 3 5 FT. 5 FT. 0 FT. ery silt; 5 FT. 'T. Da l with s nal cob	d; fine - 1 ely hard; se at de se at	nedium poorly o pth; moi lowish br brown dish bro brown brown ark yello	grained; consolida ist - rown (10 (5 YR 3) wn (10 F (10 R 3) owish bro	tted YR (4). (4).	Borehol 6.0 ft. u hollow Site che radioaci contami hole gar by TMA Corp. Ground observe 9-18-86 6.0 ft., r refusal;	tion and ation of soil by visual

		0	E	0	LO	G		DRI			G·	PROJE	<b>.</b>	· · · ·	FUSRAP					138 1		HOLE NO. 348R
SIT		MIS	-22	T.	iħa	Ма	nici	nal I	Park		COORDINA	TES		N	1945; E 315	5			ľ		IOM HORIZ	BEARING
BEC					IPLE				ain.		l	-	DRIL		E AND MODEL	S SIZ	E	OVERBL	JRDEN		K (FT.)	TOTAL DEP
					19						ENCH			_	SILE B-33		6"		0.0			10.0
COR	RE	REC	OVE	RY.	(FT	./%	) (COF	E BO	ESSA	MPLE	SEL. TO	P CASI	ENG	GRO		H/EL.	GROU	ND WAT	ER	DEPTH	/EL. TOP	OF ROCK
SAM	MPL	E H	AM	/ IER	WEI	GHT	/FALL	lc	ASING	LEF	T IN HOL	E: DI	A. /1	ENG	44.0 ¥ /				• ·		/	
					/ <b>A</b>						NO		,-					<b>D</b> . M	ICGF	RANE		
Ш	: :	<u>ار</u>	0			۲	D	WAT			<u></u>		6	Π							Τ	
SAMP . TYPE		LEN CORE	SAMPLE RE	CORE REC	BLOUS "N"	RECOVER	SUNCE SUNCE	TES	rs	MIN.	ELEV.	DEPTH	GRAPHICS	SAMPLE	DESCRIPTIC	n ar	1D CI	_ASSI	FICA	TION	WATER	ON: LEVELS, RETURN, CTER OF ING, ETC
												- - - 5			.0 - 10.0 FT. § Color stratifi soft; poorly c 0.0 - 0.5 FT. 4/2); numero 0.5 - 2.0 FT. 2.0 - 7.0 FT. a few pieces c clayey (SC).	Dark	dated	(loose)	; mois	t. 10 VP	10.0 ft. hollow-	stem augers cked for
											<b>34</b> .0_	- - 10 _			7.0 - 10.0 FT						by Eber	line-TMA, nd water
												•										
																					samples	tion of soil by visual
							= SHE			SII	ſE										examina	tion.
) =	DE	ENN	SO	1;	P≖	PIT	CHER;	0 =	OTHER			M	ISS	5-1	odi Muni	cipa	al P	ark		١	3	48R

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GEOLOGIC DRILL LOG		ET NO. HOLE NO.
SITE COORDINATES	FUSRAP 14501-138 1	and the second sec
MISS-Lodi Municipal Park	N 2045; E 3150 Vert	OM HORIZBEARING
BEGUN COMPLETED DRILLER DRI	ILL MAKE AND MODEL SIZE OVERBURDEN ROCK	(FT.) TOTAL DEPTH
)-19-86 9-19-86 MORETRENCH	MOBILE B-33 6" 9.5 G GROUND EL. DEPTH/EL. GROUND WATER DEPTH/	9.5 /EL. TOP OF ROCK
	40.8 <b>5</b> .5/35.3 9-19-86	/ /
SAMPLE HAMMER WEIGHT/FALL CASING LEFT IN HOLE: DIA.		*
	D. MCGRANE	T
	D D D D D D D D D D D D D D D D D D D	NOTES ON: Water Levels, Water Return,
		CHARACTER OF DRILLING, ETC.
	<ul> <li>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.</li> <li>0.0 - 4.5 FT. Moderate brown (5 YR 3/4) mottled with dark reddish brown (10 R 3/4) sones.</li> <li>4.5 - 6.5 FT. Moderate brown.</li> <li>6.5 - 9.5 FT. Dark yellowish brown (10 YR 4/2) mottled with dark reddish brown zones.</li> <li>Bottom of boring at 9.5 ft. Auger spoils were replaced in the hole, 9-19-86.</li> </ul>	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. Description and classification of soil samples by visual examination.
SS = SPLIT SPOON; ST = SHELBY TUBE; SITE D = DENNISON; P = PITCHER; O = OTHER MIS	S-Lodi Municipal Park	HOLE NO. 349R

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							0	PROJE	ст					JOB	NO.	SHEET	T NO.	HOLE NO.
SIT			DLOG		KIL		G	TEC			<b>FUSR</b>	AP		45	)1-13			350R
			Lodi M			ırk		1123		J	N 2050; E	3070				.e rkor Vertig	M HORIZI Cal	
BEGL			OMPLETED -19-8			DETD	ENCH				AKE AND MO		SIZE	OVERBURD	EN	ROCK		TOTAL DEPT
							ENCH	P CAS			OBILE B-	DEPTH	EL. GRO	9.		EPTH/E	EL. TOP	9.5 OF ROCK
CAM		/	R WEIGHT		leac			<b>F</b>			39.5	<b>₩</b> /	0/34.5 9	• 19•86			/	
			N/A		LAS	ING LU	NO		17/1	LEN	GTH LOGGED	BY:		D. MC	<b>GRA</b> 1	NE		
а. Ш.	کالتا			PR	JATER				ŋ	Π				<u>.</u>				
DIAM.	Ч Ч С С С С С	E E E E E E	SAMPLE BLOWS "N" % CORE RECOUERY	ω Σ	TESTS		ELEV.	DEPTH	GRAPHICS	SAMPLE	DESCRI	PTION	AND C	LASSIF	CATI	ON IL		LEVELS,
SAMP	AMP LEN	APL	SALOL REC.	G. P. M	PRESS. P.S.I.	AIN AIN AIN AIN AIN AIN AIN AIN AIN AIN			GRAI	SA						C	CHARAC	RETURN, TER OF
<u>0,7</u>	S.	<u>9</u> ,0		- 0	<u>ā</u> a.		39.5			$\left  \right $	0.0 - 9.5 F	T. <u>SIL</u>	TY SAN	2 (SM - S	<u>2)</u>		Borehole	NG, ETC.
									-		Color st with oc	ratified	; fine - n   cobble;	hedium gra soft; poorly / - saturat	ined /	11	9.5 ft. us	ing 6" tem augers.
									]		5.0 FT. 0.0 - 3.0	OFT. N	Moderate	brown (5	VR 8/4	n:		
											numero	us roun us grass	ded pebb and tree	les (0.5 - 1 roots. owish brow	1.0 FT.	);		
							Į	Į 5.			4/2).	<b>UF1.</b> 1	Jark yen	JWIBII DIOW	n (10 )	1	Site chec	ked for
	-										6.0 - 9.1	5 FŢ. I	Dark redd	lish brown	(10 R	1	radioacti	ve nation and
											3/4); U	ccasiona	al cobbie;	clayey (S	<i></i>		hole gam by Eberl Corp.	ma-logged ine-TMA,
																	Ground v observed	, 5.0 ft.,
							30.0_			╟	Bottom of	boring	at 9 5 ft	Auger spo	ile wer		9-19-86. 9.5 ft., a	
											Bottom of replaced	in the	hole, 9-1	.9-86.	MB WCI	1	refusal;	cobble?
						:												
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																	xaminat	
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			OON; ST P = PI				1 E	Μ	ISS	<b>S</b> -	Lodi M	lunic	ipal F	Park	١,	H	OLE NO.	50R
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\$11	MI		Lodi M			ırk	COORDINA				FUSRAP N 2055; E 2975			NGLE FR	ROM HORIZ	
BEG			OMPLETED			DETD	TNOIL					SIZE	OVERBURDEN	ROC	K (FT.)	TOTAL DEP
			9-19-8				ENCH	P CASI			BILE B-33	6" EL. GROL	5.0	DEPTH	I/EL. TOP	OF ROCK
		/								<b>–</b>	39.5				/	
SAM	PLE I		R WEIGH	/FALL	CAS	ING LE	FT IN HOL		A./L	EN	GTH LOGGED BY:		D. MCGR	RANE		<u> </u>
Ш Ш					JATE	2			6	Π		<del>)/ </del>			T	
SAMP . TYPI	SAMP. ADI	SAMPLE RE	SAMPLE SAMPLE BLOWS "N" X CORE	LOSS IN G.P.M	ESSU TEST: SSU SSU SSU SSU SSU SSU SSU	HINE NINE NINE	ELEV. 39.5	DEPTH	GRAPHICS	SAMPLE	DESCRIPTION				WATER CHARAC	ON: LEVELS Return Ter of Ing, et
											0.0 - 5.0 FT. SIL stratified; fine - poorly consolid: - moist.				5.0 ft. u	e drilled 0 sing 6" stem auger
							34.5	5_			$- \frac{1}{100000}$ 0.0 - 0.5 FT. I 4/2); numerous 0.5 - 2.5 FT. N 2.5 - 5.0 FT. I 3/4) with nume decomposed sar	ark yello grass roo foderate ark redd rous sand dstone.	wish brown ( ots and organi brown (5 YR ish brown (10 lstone gravel,	10 YR ics. 3/4). R poss.		
											Bottom of boring a replaced in the		Auger spoils 9-86.	were	hole gan by Eber Corp. No grou	ive nation and nma-logge line-TMA nd water
															observed	3. •
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													·			
																ion and ation of so by visual
															examina	
SS	= SPI	.17 \$	POON; S	= SHE	LBY TL	/ /	ITE				-Lodi Munic				HOLE NO	51R

	0	:=(	DLOG		DIL			PROJE	CT				JOB NO.		ET NO.	HOLE NO.
SIT			log				COORDIN	TES	<i></i>		FUSRAP		14501-1		OF 1 OM HORIZI	352R
		<u>S-1</u>	.odi Mi	unicip	al Pa	rk			_	]	N 2050; E 2900		ſ	Vert	1	
BEG			MPLETED					Ī		LĪ	MAKE AND MODEL	SIZE OVE	RBURDEN		( (FT.)	TOTAL DEPT
			-19-80				ENCH	P CASI		-	OBILE B-33 ROUND EL. DEPTH/	6"	8.5	DEPTH	/EL. TOP	8.5
		_/										0/34.4 9-19-1			/ /	Of ROOK
SAM	PLE H		R WEIGHT	/FALL	CAS	SING LE			A./L	.EN	IGTH LOGGED BY:					
L.	•		N/A	[i	JATER	2		NE	ī —	TT	<u> </u>	<u> </u>	MCGR	ANE	1	
SAMP. TYP	SAMP. ADU. LEN CORE	SAMPLE REC.	SAMPLE BLOWS "N" % CORE RECOVERY	COSS NI G. P. M	ESSU	RE	ELEV.	DEPTH	GRAPHICS	SAMPLE	DESCRIPTION	i and clas	SIFICA	TION	WATER	ON: LEVELS, RETURN, TER OF NG, ETC
		<u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u></u>					40.4	-  5  			0.0 - 8.5 FT. SIL stratified; fine occasional coar soft; poorly con saturated at 6.0 0.0 - 0.5 FT. I 4/2); numerous 0.5 - 8.5 FT. M mottled with a R 3/4) zones. Bottom of boring a replaced in the	se gravel or ar isolidated (loo O FT. depth. Dark yellowish grass roots a Moderate brow few dark redd	nall cobbli se); dry - i brown (1 nd organic wn (5 YR S lish brown	0 YR 8. 3/4) (10	Borehole 8.5 ft. us hollow-s Site chec radioact: contamin hole gan by Eberl Corp. Ground observed 9-19-86. 8.5 ft., a refusal;	chilled 0 - ing 6" tem augers. ked for ive nation and ima-logged ine-TMA, water , 6.0 ft., uger cobble?
			00N; ST P = PI				ITE	M	ISS	_	-Lodi Munic	ipal Par	k	\	HOLE NO.	52R

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		Ģ	ΞE	0	LC	G		RIL	LLC	G	PROJE	CT	•••••	JOB NO FUSRAP 14501	. SHE -138 1	ET NO.	HOLE NO
sı	ITE		-							COORDIN	ATES			· · · · · · · · · · · · · · · · · · ·	ANGLE FR	OM HORIZ	
BE	EGU						DRIL	Dal Pa LER	ark			DRIL		N 2100; E 2900 MAKE AND MODEL SIZE OVERBURDEN	Vert IROCI	ical (FT.)	TOTAL DE
					-19					RENCH			M	OBILE B-33 6" 5.0			5.0
	жE	KEL	UVE	:кт /	(1)	./%		E BUXE	S SAMPL	ESEL. TO	P CAS	ING	G	COUND EL. DEPTH/EL. GROUND WATER 40.3	DEPTH	/EL. TOP /	OF ROCK
SA		•			WEI I/A		/FALL	CA	SING LE	FT IN HO		A./I	E	GTH LOGGED BY:	RANE	/	
ХрЕ	ι. Σ	LEN CORE	ËĊ.	ċ.	<u>יי</u> עניין	۳ <u>۲</u>	- PF	WATE	JRE		_	ရ					
F-	AND DIAM.	₹ Ö	UZ U	ĕ	SAMPLE BLOWS "N"			TEST	1	ELEV.	DEPTH	GRAPHICS	SAUPLE	DESCRIPTION AND CLASSIFIC	ATION	NOTES WATER	LEVELS
AMP			ILLE	В В	20 20 20	N E N E N E N	G. P. M	PRESS.	HINE MIN.		ö	GRA	SA			WATER	TER OF
S	"	ທ <sup>ເ</sup>	<u>6</u>	4		-	- 0		·	40.3			$\left  \right $	0.0 - 5.0 FT. SILTY SAND (SM) Colo	r		drilled 0
				Ì										stratified; fine - medium grained wit numerous pieces of reddish brown (10 8/4) conditions (0.0 - 1.0 FT.); coffic	R	5.0 ft. us hollow-s	ing 6" tem auge
											-			3/4) sandstone (0.0 - 1.0 FT.); soft; poorly consolidated (loose); moist. 0.0 - 2.5 FT. Moderate brown (5 YF 2.5 - 5.0 FT. Dark reddish brown.	2 3/4).		
														2.5 - 5.0 FT. Dark reddish brown.			
								-		35.3_	5_					Site chec	ked for
														Bottom of boring at 5.0 ft. Auger spoils replaced in the hole, 9-19-86.	were	radioact contami	ive nation an
																hole gan by Eberl Corp.	ine-TM/
				ľ												No group observed	nd water
																:	
				Ì													
																1	
											1						
											· ·					Descripti classifica	tion of so
1															:	samples l examinat	
												l					
								LBY TU 0 = 0		TE	R.A	191	5	-Lodi Municipal Park	·	HOLE NO.	
<u> </u>	- 0	- 44		• j	r •	r11	unck;	0 - 0	INCK	<u> </u>	171	100			١	3	53R

		EC	DL	OG	IC D	RIL	L LC	G ·	PROJE	СТ	JOB NO. SHEET NO. HOLE NO. FUSRAP 14501-138 1 OF 1 354
SITE		· · ·		• • •				COORDIN	ATES		ANGLE FROM HORIZBEARING
BEGU					unicij DRIL		ark			0011	N 2100; E 2975 Vertical MAKE AND MODEL SIZE OVERBURDEN ROCK (FT.) TOTAL D
		1		9-8(			RETE	RENCH			OBILE B-33 6" 50 50
								ESEL. TO	P CAS		GROUND EL. DEPTH/EL. GROUND WATER DEPTH/EL. TOP OF ROCK
		1									
SAMP	LE H				/FALL	CA	SING LE	FT IN HO		(A./L	
ш	el.	****	<u>N/</u>		<u> </u>	WATE	P	NO	NE I	<u> </u>	D. MCGRANE
SAMP. TYPI	LEN CORE	CORF RFC	SAMPLE	RECOVERY	LOSS LOSS G. P. M G. P. M	RESSU TEST	JRE	ELEV.	DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION WATER LEVEL WATER RETUR CHARACTER O DRILLING, E
								<b>34.</b> 8 <u>7</u>	5_		<ul> <li>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.</li> <li>0.0 - 0.5 FT. Dark yellowish brown (10 YR 4/2); numerous pieces of sandstone gravel; dry. 0.5 - 1.5 FT. Moderate brown (5 YR 3/4); moist.</li> <li>1.5 - 5.0 FT. Dark reddish brown; moist - saturated at 5.0 fT.</li> <li>Bottom of boring at 5.0 ft. Auger spoils were replaced in the hole, 9-19-86.</li> <li>Site checked for contamination again of boring at 5.0 ft. Auger spoils were replaced in the hole, 9-19-86.</li> </ul>
											Description and classification of s samples by visua examination.
					= SHE TCHER;			1TE	M		S-Lodi Municipal Park A 354R

1								<u> </u>	PROJEC	:1				JOB NO		EET NO.	HOLE NO.
	SITE		EU	LOG		RILI		COORDIN	TES		FUS	SRAP		14501	-138 1	OF 1 ROM HORIZ	356R
			S-I	odi M	unicip	al Pa	rk				N 2100;	E 3150				tical	
	BEGU	N	cc	MPLETED	DRILL	ER			F		MAKE AND	MODEL	SIZE	OVERBURDE		K (FT.)	TOTAL DEPTH
				-19-80				ENCH	P CASI		OBILE	DEPTH/	EL. GROU	10.0		H/EL. TOP	OF ROCK
			1								40.9	<b>I</b> /	)/33.9 9· 	19-86		/	
	SAMP	LE H		₹WEIGH1 N/A	FALL	CAS	ING LE	FI IN HO		A./L	NGTH LOG	GED BY:		D. MCG	RANE		
	<b>N</b> •	ير أح			6	JATER	2			6	<u> </u>					T	
	DIAM.	SAMP. ADU. LEN CORE	RECE	<b>л</b> , К. М. К.	1	ESSU		ELEV.	Ŧ	BRAPHICS	DESC	RIPTION	AND C	LASSIFIC	ATION	NOTES	ON: LEVELS,
	₽	μ.Υ.	밀민		LOSS LOSS B. P. M	535. . I.	TIME MIN.		DEPTH	đe	DESC					WATER	RETURN,
	SAMP		E E E E E E	SAMPLE BLOWS "N" X CORE RECOVERY	<u>о</u> ге	PRESS. P. S. I.	τ-Ε	40.9		ð						DRILLI	ING, ETC.
											0.0 - 10 strat	.0 FT. <u>SII</u> ified; fine	- medium	D (SM) Co grained; so se); moist - th. brown (5 Y d organics (	lor ft;	10.0 ft.	
									-		satu	rated at 7.0	ated (100) 0 FT. dep Moderate	th. th.	/R 3/4):	nollow-l	stem augers.
									-		num ft.).	erous grass	roots and	d organics (	0.0-0.5		
								I.	-		1.5 3/4)	3.5 FT. I numerou	Dark redd s pieces o	ish Brown ( f sandstone (5 G 7/2),	10 R gravel.		
									5_		siltv	: fine grain	ed.	lowish Brow		Site che radioact	
								7	-		YR YR	10.0 F 1. 1/2).	Dark 1ei	IOWIBII DIOW	a (10	contami	nation and
								-	-	]						Corp.	nma-logged line-TMA,
									-							Ground	1, 7.0 ft.,
								<b>3</b> 0.9_	10 -				<u></u> ,			9-19-86	•
											Bottom were	of borehol replaced in	e at 10.0 n the hole	ft. Auger s; e, 9-19-86.	poils		
												•					
																Ì	
																Descript	ation of soil
																samples examina	by visual
- 1		-															
		-															
	SS ≖	SPI	LT SI	200N; S1	= SHE	BY TI	BE S	ITE		L	I					HOLE NO	
				; P = PI					M	IIS		Munic	ipal F	Park	١		56R
											A-16						

		GE(	C	OG	IC D	RIL	L LO	G	PROJE		FUSRAP		JOB NO. 4501-		ET NO. OF 1	HOLE
SITE		26 1			unicip			COORDIN	ATES		N 3160 E 3160			IGLE FR	OM HORIZ	
BEGL					DRIL		ITK	1		DRIL	N 2160; E 3150 MAKE AND MODEL		BURDEN	Ver ROCI	LICAL	TOTA
				9-8				ENCH		J	MOBILE B-33	6"	6.0			
CORE	KEL	UVER /	(T (	FI./7		E BOXE	SISAMPL	ESEL. TO	P CAS	ING	GROUND EL. DEPTH/ 41.2 ₹ /	'EL. GROUND WA	TER	DEPTH	/EL. TOP	OFR
SAMP	LE H				/FALL	CA	SING LE			IA./L	ENGTH LOGGED BY:		<u>.</u>	1	/	
	•	_	<u>N/</u>		1	WATE		NO	NE	1		D.	MCGR	ANE	· · · · · · · · · · · · · · · · · · ·	
SAMP. TYPE AND DIAM.	ADC DRE			X CORE	PF	RESSU	IRE		I	S S	щ				NOTES	ON:
6		빌	I L L		ő,Σ	ю́н.	뿌ィ수	ELEV.	DEPTH	GRAPHICS	백 전 DESCRIPTION 전 전	AND CLASS	IFICA	TION	WATER	LEV
盟		E E	່ທີ່	IJ×Ĕ	G. P. M	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	TIME MIN.			В В	ស៊				CHARAC	TER
<b>,</b>	•,	ιο.	1-					41.2			0.0 - 6.0 FT. SIL	<u>ry sand</u> (sm	- SC)		Borehole 6.0 ft. u	e dril
			.								Color stratified soft; poorly con 0.0 - 3.5 FT. I	solidated (loose) ark reddish br	e); moist	R	hollow-	item :
										]	(0.0-2.0  ft) N	pieces of sands	stone gra	vel		
											organics (0.0-0 3.5 - 4.0 FT. ( 4.0 - 4.5 FT. I	.5 ft.). Frayish black (1	N2); clay	ey.		
									5_		4.0 - 4.5 FT. 1 4/2). 4.5 - 6.0 FT. 1				Site chee	-kod
								35.2_		11	3/4).			-	radioact	ive natio:
											Bottom of borehol were replaced in	e at 6.0 ft. Aug n the hole, 9-19	ser spoils -86.	I	hole gan by Eberl	nma- line-1
															Corp. No groun observed	nd wa
															Observed	
															ĺ	
													. <sup>.</sup>			
															}	
												•				
ł															Descripti classifica	ion a
															samples   examinat	by via
							ļ									
 SS =	SPLI	TSF		; ST	= SHEI	LBY TU	BE; SI	TE			<u> </u>				HOLE NO.	
D = C	ENNI	SON;	P	= P11	CHER;	0 = 0	THER		M	ISS	5-Lodi Munic	ipal Park		<u>۱</u>	3	57F

		G	EC	DL	.00	GI	CD	RIL	L LO	)G	PROJE			FUSRAP			-138	HEET NO. 1 OF 1	HOLI
SITE		15	5-1	[.n	di N	<b>A</b> n	nicip	al Po	ark	COORDIN	ATES		1	N 2170; E 3075			ſ	FROM HORIZ	BEAR
BEGL							DRILL					DRIL		AKE AND MODEL SIZE	E OVER	BURDEN		OCK (FT.)	TOT/
					<u>19-</u>					ENCH			M		5"	5.0			
UKE		:	VER /	.1	(***	(*)		BUXE	SAMPL	ESEL. IU	A LAS	ING	GK	OUND EL. DEPTH/EL. 40.6 ¥ /	GROUND W	IEK	DEP	TH/EL. TOP	' OF 1 /
SAMP	LE	HA				HT/	FALL	CAS	SING LE			[A./I	EN	GTH LOGGED BY:			<b>I</b>		
				<u>N/</u>	<u>'A</u>	T		JATE		NO	NE	1	TT	<del></del>	<b>D</b> .	MCG	RANI	<u>E</u>	
DIAM.	ADU.	CORE	REC.	PLE	DRE	씱	PR	ESSU TESTS	IRE 5	ELEV.	H	HICS		DESCRIPTION AN		SIFIC		NOTES	
SAMD.	SAMP.		CORF	SAMI	BLOWS "N" X CORE	RECO	LOSS IN G.P.M	PRESS.	AIN. MIN.		DEPTH	GRAPHICS	SAMPLE					WATER CHARA DRILL	RE: CTER
<u>u)</u>	<u>, (0</u>	┦	ō'	$\uparrow$		╉				40.6			╢	0.0 - 5.0 FT. SILTY S	AND (SM	- SC)		Boreho 5.0 ft. 1	le dri
														Color stratified; fine soft; poorly consolid 0.0 - 3.5 FT. Dark 3/4); numerous piec (0.0-1.0 ft.) Numer	lated (loos reddish bi	e); moi own (1	st. 0 R	hollow-	stem
							:							3/4); numerous piec (0.0-1.0 ft.) Numer	es of sand ous grass	stone g roots a	ravel nd		
											.		3	3.5 - 4.0 FT. Gravi	). ish black (	N2): cl	avev.	ŀ	
										35.6_	5_			Numerous roots and 4.0 - 5.0 FT. Dark 4/2).	Yellowish	Brown	(10 YI	R Site ch	cker
																		radioac contam	tive inati
												1		Bottom of borehole at a were replaced in the	5.0 ft. Au hole, 9-1	ger spo 9-86.	als	hole ga by Ebe Corp.	mma rline
																		No grou observe	
				l															
				[															
													$\left  \right $						
				l															
												ł							
												1							
							ļ											Descrip classific	ation
											;							samples examin	
							= SHEL		/	ITE						· · ·		HOLE NO	
<b>=</b>	DEN	NI	SON;	; F	' = P	11	CHER;	0 = 0	THER	<u> </u>	M	IIS:		-Lodi Municipa	al Parl	٢	١	3	<u>858</u>

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		_						-	PROJE	CT			JOB	NO. SHE	ET NO.	HOLE NO.
l.			iE(	DLOC	IC L	RIL						FUSRAP	450	1-138 1		359R
الله . السب	SITE			r			_1.	COORDIN	ATES		,	N 3160 D 3075		1	OM HORIZI	BEARING
•	BEGL		<u>1-60</u>	Lodi M OMPLETE		DAI PA	ILK	_L		DRTI		N 2160; E 2975 MAKE AND MODEL	SIZE OVERBURD			TOTAL DEPTH
			- F	9-19-8			RETR	ENCH				OBILE B-33	6" 5.	5	( (F) - J	5.5
								ESEL. TO	P CAS			ROUND EL. DEPTH	/EL. GROUND WATER	DEPTH	/EL. TOP	
<b>i</b>												<u>39.7</u>			/	
	ISAMP	LE #		R WEIGH	T/FALL	CAS	SING LE			(A./I	EN	IGTH LOGGED BY:				
·				<u>N/A</u>	1	WATE	<u> </u>	NO	NE	T	П		D. MC	GRANE	T	
ſ	DIAM.	SAMP. ADU. LEN CORE		SAMPLE BLOWS "N" X CORE	PF	RESSU	RE		-	GRAPHICS					NOTES	0.10
	ΓΪ.	¶0 S	шÖ		σΣ		1	ELEV.	DEPTH	H		DESCRIPTION	N AND CLASSIFT	CATION	NOTES WATER	LEVELS,
<b>`~~</b> ~	SAMP.	ĒZ	Ē		LOSS LOSS	800 100 100	TIME MIN.		B	RAF	SA					RETURN, TER OF
	₩ S T S T	S			o	8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	FΣ	39.7		ō	Π					NG, ETC.
<b>l</b>								39.2_			$\left  \right $	0.0 - 0.5 FT. <u>SIL</u> reddish brown	TY SAND (SM) D: (10 R 3/4); fine - r poorly consolidated ( and organics; mois	ark nedium Í	5.5 ft. us	drilled 0 - ing 6"
					1							grained; soft; p few grass roots	oorly consolidated ( and organics: mois	loose); t	hollow-s	tem augers.
{												0.5 - 5.5 FT.	DECOMPOSED			
<b>i.</b> Mar												SANDSTONE 3/4): fine grain	DECOMPOSED Dark reddish brown red (argillaceous); so well cemented; tota highly weathered; d sand (SM) and grav	n (10 R oft -		
*		•							5			hard; poorly - decomposed -	well cemented; tota highly weathered: d	lly rill spoils		
								34.2_	•-	<u> </u>	╢	consist of silty moist.	sand (SM) and grav	el,	Site chec radioact	
£ 															l contamii	nation and
* 5												Bottom of boreho were replaced i	le at 5.5 ft. Auger s in the hole, 9-19-86	poils	by Eberl Corp.	ima-logged ine-TMA,
1						:						• • • •	• • • •		No groun observed	nd water
·																
1					·										Auger re	fusal at 5.5
$\sim$																
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<b>S</b>																
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l (			-		l											
`																
₹ <sup>®</sup>									· ·						Descripti	ion and tion of soil
1										1	$\ $				samples	by visual
$\sim$											$\ $					
<b>\</b>										1.	$\ $					
L!																
				POON; S				ITE			6	Lod: Marris	in al Daula		HOLE NO.	
	υ = I	JENN)	SON	; P = P	ICHER;	0=0	HER		IVI	13	_	-Lodi Munic	прат магк	١	3	59R

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		EO	LOG	C D	RIL	L LQ	G _	PROJE			FUSRAP		-138 1		HOL
SITE		S-T	odi Mı	inicin	al Pa	rk	COORDIN	TES		N	2165; E 2900		ANGLE FR Veri	OM HORIZ	BEAR
BEGU	IN	co	MPLETED	DRILL	ER		<u>I</u>			LM	AKE AND MODEL SIZE	OVERBURDE		( (FT.)	τοτ
			-22-86				ENCH	247 Q			BILE B-33 6" DUND EL. DEPTH/EL. GRO	IND WATER	IDEDTH	/EL. TOP	
	. NLU	/			BUAL						40.3	MD WATER		/ /	0.
SAMP	LE		≀⊎EIGHT N/A	/ F41.00	CAS	ING LE	FT IN HO		A./L	ENG	TH LOGGED BY:	D. MCG	RANE		
<u>ا</u> ۳	<b>ت</b> اس	<u>.</u>	<u> </u>	J D	JATE ESSU	2			m	Π					
SAMP. TYPE AND DIAM.	AMP. AD	MPLE RE	SAMPLE BLOWS "N" X CORE RECOVERY	LOSS IN G.P.M	EST	TIME TIN MIN.	ELEV.	DEPTH	GRAPHICS	SAMPLE	DESCRIPTION AND (	LASSIFIC	ATION	NOTES WATER WATER CHARAC	LE RE TE
Ğα	<u>_ ای</u>	8 U		- 0	āc		40.3			╟	0.0 - 5.0 FT. SILTY SAN	D (SM) Cold	r	DRILLI Borehol	e dı
											stratified; fine - mediun poorly consolidated (loc 0.0 - 1.0 FT. Moderate Numerous grass roots at ft.). 1.0 - 5.0 FT. Dark yell 4/2)	n grained; soi se); moist. brown (5 Yl nd organics ( owish brown	t; 2 3/4); 0.0-0.5 (10 YR	5.0 ft. u hollow-r	sing ter
ļ							35.3_	5.			Bottom of borehole at 5.0 f were replaced in the hol	ft. Auger spo e, 9-22-86.	oils	Site che radioact contami hole gan by Eber Corp. No grou	ive nat nma line
														observed	1. 1.
								, ,							
								l							
														1	
														Descript	atic
														samples examina	by
 5S =	SPL	IT SF	POON; ST	= SHEI TCHER;	LBY TL	, 1	ITE			Ц_ С	Lodi Municipal			HOLE NO	

T		ى م	FC	DLOG		RII	10	G	PROJEC	T				JOB NO		HEET NO.	HOLE NO.
L.	SITE							COORDINA	TES			FUSRAP				1 OF 1 FROM HORIZ	361R BEARING
•				.odi Mi			rk		····· E			N 2165; E 3025				rtical	
	₿EGU .9-2			MPLETED			RETR	ENCH	ľ			MAKE AND MODEL OBILE B-33	SIZE 6"	OVERBURDEI		DCK (FT.)	TOTAL DEPTH 5.0
•						BOXE	SAMPL	ESEL. TO	P CASI			ROUND EL. DEPTH,	/EL. GRO	UND WATER	DEP	TH/EL. TOP	
<b>I</b> .	SAMP	LE H	/ NHMEI	R WEIGHT	/FALL	CAS	ING LE	ST IN HOL	E: DI	A./L	EN	39.9 \$ / GTH LOGGED BY:				/	
				N/A				NO	NE		_			D. MCG	RANI	<u> </u>	
r	μ. Η Η	SAMP. ADU. LEN CORE		ա <u>–</u> Հա–	PR	JATER	RE		_	ဗ္ဗ		·					
[	DIAM.	CO.	ш Г Г Г	4 8 1 2 2 8 3 8 3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ω Σ	CESTS		ELEV.	ОЕРТН	Ħ		DESCRIPTION	AND C	CLASSIFIC	CATION		LEVELS,
•	SAMP	LEN	T B	SAMPLE BLOWS "N" X CORE RECOVERY	LOSS IN G. P. M	PRES.	TIME IN MIN.		ö	GRAPHICS	SA					CHARAC	RETURN,
	0 <sup>,4</sup>	ທ <sup>ີ</sup>	<u> </u>			āa	· -	<u>39.9</u>			H	0.0 - 5.0 FT. SIL	TY SAN	<u>р (</u> ям - sc)		Borehold	NG, ETC.
- 									-			0.0 - 5.0 FT. SIL Color stratified soft; poorly co 0.0 - 1.0 FT. J with numerous (10 R 3/4) san	l; fine – n nsolidated Moderate	nedium grain d (loose); mo prown (5 Vl	ied; ist. R 3/4)	5.0 ft. u hollow-s	sing 6" stem augers.
[									-			with numerous (10 R 3/4) san	pieces of dstone; N	dark reddis Jumerous gra	h brown as roots		
									-			1.0 - 2.5 FT	Dark r	eddish brow	n:		
i		1						\$4.9_	5_			occasional root 2.5 - 3.5 FT. 1 clayey (SC). 3.5 - 5.0 FT. 1	Pale gree	n (5 G 7/2);		Site che	
1												$\begin{array}{c c} 3.5 - 5.0 \text{ FT.} \\ 4/2 \end{array}$	Dark Yell	lowish Browr	n (10 YF	li contami	nation and
												Bottom of boreho were replaced i	le at 5.0 f	ft. Auger sp	oils	Corp.	nma-logged line-TMA,
												were replaced i	n the hol	le, 9-22-86.		No grou observed	nd water i.
`~																	
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( <sup>-</sup>																	
l i																	
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<u> </u>									•								
f l																	ation of soil
<b>€</b> _ /																samples examina	by visual tion.
[																	
$\mathbf{l}_{i}$																	
r				YOON; ST				ITE						Davle		HOLE NO	
<b>{</b>	U = 1	DENN	SON	; P = PI	ICHER;	0 = 0	THER	<b></b>	M	12		-Lodi Munic	lipal	rark	`	3	61R

						<u>DU</u>			PROJE	CT		JOB NO. S	HEET NO.	HOLE NO.
	SITE		EC	DLOG		KIL		COORDINA	TES			FUSRAP 14501-138	1 OF 1 FROM HORI	363R
	1		S-1	odi Mu	unicip	al Pa	rk		123			1	ertical	
	BEG			MPLETED			DETD	ENCH					OCK (FT.)	TOTAL DEPTH
_				-22-80 r (FT./X				ENCH	P CASI			ROUND EL. DEPTH/EL. GROUND WATER DEF	TH/EL. TO	5.0 P OF ROCK
			/	R WEIGHT	/EALL	6.00		ET IN HOL	E. DI	<u></u>		39.2 37.		/
	SAA	LE N		N/A	/ FACE		ANG LE	NON		<u>.</u> ./L	. 6. 7	D. MCGRAN	Ξ	
	Π. Π	ວ່ມ			PR	JATER	RE			Ŋ	Ĺ			
	SAMP . TYP	SAMP. ADU. LEN CORE	Ш В В В В В В В В В В В В В В В В В В В	SAMPLE BLOWS "N" X CORE RECOVERY		EST:		ELEV.	DEPTH	GRAPHICS	SANPLE	DESCRIPTION AND CLASSIFICATION		LEVELS,
		EN N	<u>т</u> В В	Sol ×ã Sol ×ã	LOSS IN G. P. M	PRESS.	TIME MIN.		D	BRAF	SAI		CHARA	RETURN,
	SA SA	<u>%</u>	<u>щ</u> о				P 2	39.2				0.0 - 5.0 FT. SILTY SAND (SM) Color	Boreho	ING, ETC.
									•			stratified; fine - medium grained; soft; poorly consolidated (loose); dry - moist. 0.0 - 1.0 FT. Dark yellowish brown (10 YF	5.0 ft. hollow	using 6" -stem augers.
									•			4/21: numerous pieces of mixed lithologies	1	
												(FILL); numerous grass roots and organics 1.0 - 2.5 FT. Mottled moderate brown (5 YR 3/4) and dark reddish brown (10 R		
								84.2_	5_			3/4); lew roots, moist. 2.5 - 4.5 FT. Dark yellowish brown. 4.5 - 5.0 FT. Dark reddish brown.	Site ch	ecked for
										ļ			radioad contan	tive nination and
												Bottom of borehole at 5.0 ft. Auger spoils were replaced in the hole, 9-22-86.	by Ebe Corp.	mma-logged rline-TMA,
													No gro observe	und water ed.
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	1													
	1													
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													classifi	otion and cation of soil
														s by visual
$\sim$	1													
										1				
				POON; ST				ITE			ц С	Ladi Munisinal Daula	HOLE N	
	D =	DENN	ISON	; P = PI	TCHER;	0 = 0	ITHER		M	13		-Lodi Municipal Park	·	363R

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	0	FC	LOG		RIII	10	G	PROJE	CT					JOB N		ET NO.	HOLE NO.
SITE		EU			1\1LI		COORDIN	TES			FUSR	Aľ		1450	1-138 1 ANGLE F	OF 1 ROM HORIZ	BEARING
			odi Mu			rk	<u> </u>		,		2000; E			<u> </u>		tical	
 BEGU			MPLETED			DTTD	ENCH				KE AND NO BILE B-		SIZE 6"	OVERBURDE		K (FT.)	TOTAL DEPTH
			-22-80 ( (FT./%				ESEL. TO	P CAS			UND EL.	DEPTH	EL. GRO	JND WATER		H/EL. TOP	the second s
		_/									39.1	F.	5/34.6 9			/	<del></del>
SAMP	LE H		R₩EIGHT N/A	FALL	CAS	ING LE	FT IN HO		IA./L	ENG	TH LOGGED	51:		D. MCG	RANE		
J.	<u>یار ا</u>	_			ATE	2			ß								
SAMP. TYPE AND DIAM.	LEN COR	AMPLE REC	SAMPLE BLOUS "N" X CORE RECOVERY	COSS NN M. H. G. P. M.	TESTS	TIME NIN. MIN.	ELEV.	DEPTH	GRAPHICS	SAMPLE	DESCRI	PTION	I AND C	LASSIFI	CATION	WATER	ON: LEVELS, RETURN, CTER OF ING, ETC.
	<u><u></u></u>						39.1	5.			Color s soft; po saturat 0.0 - 2. 4/2); n: (0.0-0.1, 2.0 - 5. clayey green (i) organic 5.0 - 10	tratifiec orly con- ed at 4. 0 FT. 1 umerou: 5 ft.). 0 FT. 1 (SC). 00 5 G 7/2 5. 0.0 FT.	l; fine - n nsolidated 5 FT. dej Dark yell s grass ro Moderate ccasional ) silt lens Dark yell	1D (SM-SC medium graii 1 (loose); mo ots and org: brown (5 Y thin 0.5 in. e; numerous owish brown ft. Auger a e, 9-22-86.	ned; oist - a (10 YR anics 'R 3/4); pale s n.	Borehol 10.0 ft. hollow-s Site che radioact contami hole gan by Eber Corp. Ground observe 9-22-86	tion and aby visual
ss :	= SPL	IT S	POON; SI	r = She	LBY TI	/	SITE	 *		c 	Lodi N	Auni	cinal	Dark		HOLE NO	364R
0 =	DENN	ISON	; P = P	HCHER;	U = 1	JINEK		J\	113	_	-24	-14111	cihai		· · ·	<u></u>	

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										PROJE	СТ				LIOP NO	ieur	ET NO		
	GEOLOGIC DRILL LOG												FUSRAP		JOB NO. SHEET NO. HOLE NO. 14501-138 1 OF 1 365R				
SI			<u> </u>						COORDIN	ATES					ANGLE FROM HORIZBEARING				
	_	_				unicip		<u>irk</u>			γ		N 1945; E 3030	Vert					
•	GUN					DRIL		סדינס	ENICIT						RBURDEN	ROCK	(FT.)	TOTAL DEPTH	
_	9-22-86 9-22-86 MORETRE CORE RECOVERY (FT./%) CORE BOXES SAMPLES												OBILE B-33	6" EL. GROUND L	10.0	DEPTH	/EL. TOP		
	43.1 ¥												/ / / /	VI RUCK					
SA	MPL	EH	AMME	RW	EIGHT	/FALL	CAS	SING LE	FT IN HO	LE: D	IA./	LE	NGTH LOGGED BY:				/		
				<u>N/</u> .	<u>A</u>				NO	NE				<u> </u>	MCGRA	NE			
a E		Normalize     Normalize     Water PRESSURE TESTS     Normalize       Normalize     PRESSURE TESTS     Normalize     Normalize       Normalize     Tests     Normalize     Normalize       Normalize     Normalize     Normalize     Normalize																	
IdX1		ĬÖ		<u>ו</u> קייני גומי			TEST		ELEV.	E	GRAPHICS	S DMD	DESCRIPTION	AND CLAS	SIFICAT	ION	NOTES	ON: LEVELS,	
Ľ		iz		Ĩ		ω Σ.	I MH	TIME MIN.		DEPTH	<u> </u>	MC.					WATER	RETURN,	
ghia		LEN	ΞŪ		3 ~œ	COSS LOSS P. M	PRES.	부부분	43.1	-	18	n,						NG, ETC.	
F		-		+	·	<u> </u>			43.1			t	0.0 - 10.0 FT. SIL' stratified; fine -	TY SAND (S	M) Color	······	Borehole	e drilled 0 -	
											1		poorly consolida	medium grai ated (loose); c	ined; soft; iry - moist.		10.0 ft. 1 hollow-s	using 6" Item augers.	
		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.																	
										5.	-   :						Site chee	cked for	
		6.0 - 6.5 FT. Darl 6/6) 6.5 - 8.0 FT. Darl									-[]		6.0 - 6.5 FT. D	ark yellowish	orange (10	YR	radioactive		
1										-	• •		hole gan	nma-logged line-TMA,					
											-	l	80-85FT D	lark reddieb b	rown (10 B		Corp. No groui		
	,										-		3/4). 8.5 - 10.0 FT. N brown and mode	Mottled dark	observed	I.			
									\$3.1_	10	12	4	brown and mode	erate brown.			4		
													Bottom of borehole were replaced in	at 10.0 ft. A	Auger spoils 22-86.				
4																			
				1															
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ſ																:	samples		
1																	examinat	tion.	
											·								
ss	 = 1	SPL I	TS	I POON	; ST	= SHEI	.BY TU	BE; SI	ITE		<u> </u>	1					HOLE NO.		
						TCHER;				N	IIS	S	-Lodi Munici	ipal Par	k v			65R	
													A-25						

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<b>L</b>	SIT		SC-1	Lodi M	unicin	al Da		COORDINATES ANG								LE FROM HORIZBEARING Vertical		
T	BEG			OMPLETED						DRIL		AKE AND MODEL	SIZE	OVERBURDE		ROCK		TOTAL DEPTH
Ł				2-8-8				ational	D. 010			linuteman	3"	7.0				7.0
_~	LOK	: REC	UVER /	1 (11.//		: BUXE	S SAMPL	ESEL. TO	P CAS	ING	GRC	NUND EL. DEPTH ¥ /	/EL. GROU	ND WATER	DE	EPTH/E	L. TOP	OF ROCK
	SAM			R WEIGHT		CAS				IA./L	LENG	TH LOGGED BY:			. !		/	
<b>L</b> '				<u>./18 in</u>		JATER		Noi	ne	1	<del></del>			Richard	Migu	ies		
[	SAMP. TYPE AND DIAM.	SAMP. ADU. LEN CORE	SAMPLE REC. CORE REC.	SAMPLE BLOWS "N" X CORE RECOVERY	PR SSOJ	ESSU	RE	ELEV.	DEPTH	GRAPHICS		DESCRIPTIO				א אל ע ר	JATER CHARAC	ON: LEVELS, RETURN, TER OF NG, ETC.
L :	33	1.0	0.8									0.0-1.3 ft. SILTY Moderate brow	CLAYEY	SAND (SC	). Peto			
	SS		0.6	I				-			2	medium-grain	ea with pe	DDIes (to 1	incn).	- 117	Borehole 0.0-7.0 fi	drilled t. using 3"
T	SS SS	1.0	1.0 1.0					-		- -		1.3-1.9 ft. CLAY Moderate redd medium-grain (5R2/2) (at 1. fragments (at	EY SAND	(SC). (10R4/6); f	ine-to	╷╢╸		m augers.
<b>4</b> , '	SS		0.7							-		(5R2/2) (at 1.	9 ft.); Brui 1.6 ft.).	nswick sand	stone		Site chec adioacti	
T	SS	1.0	1.0						5_			1.9-2.5 ft. <u>SILTY</u> brownish gray					nole gam by Eberli	ma-logged ine-TMA,
1	SS	1.0	0.6					1	·			brownish gray medium-grain sandstone.	(5YR6/1) ed with cla	; very fine-t sts of Brun	to swick	Ē	Corporat	ion.
												2.5-5.7 ft. ASPH (N1), 2.5-3.3 ft., brock 4.8 ft., brick fr 5.7-6.3 ft. CLAY 6.3-6.5 ft. SILT ( (5YR6/1). 6.5-7.0 ft. SAND (10YR6/2); me (5YR5/6); fine Bottom of hole at 12-8-87.	(CL). Dar. (CL). Dar. (ML). Brow (S). Pale y ottled with to mediu	k (5YR2/1) k gray (N3) wnish gray vellowish brown m-grained.	). own n	f	vas hand rom side	the interval
																DdH9141D	lrilled at 2985 to 0 ft. Hogged ex hat 3.5-	1207 was N1977, a depth of ole was not cept to note 7.0 ft was y spoil. No
				·					•							C. Bi	)escriptid lassificat amples t xaminat	ion of soil y visual
				P = PI				TE	М	19	5-	Lodi Munic	inal D	ark		H	DLE NO.	07A
			,			. – V					_	-26	ihai L		1		12	VIA

Bits     Downerse     Part Program     Part Program     Part Program     Part Program       Bits     Description     Description     Description     Description     Description       Bits     Description     Descri	Γ	GEOLOGIC DRILL LOG															
MISS-Lodi     Multiple     Park     N 1970; E 2437     Verical        12-8-87     Dechtel National     PILL MAC AND ROCL     S12     PUERBADDN     ROCK (F1) [TOTAL     S0.0       12-8-87     Dechtel National     Multeman     3     9.0     S0.0     S0.0       140 UBS-/18 inches     None     Fill     None     Fill     None     None       140 UBS-/18 inches     None     MURTER     None     Notes     Notes     Notes       140 UBS-/18 inches     None     MURTER     None     Notes     Notes     Notes       140 UBS-/18 inches     None     MURTER     None     Notes     Notes     Notes       151 01 00     Statistic     Statistic     Statistic     Notes     Notes     Notes       151 01 00     Statistic     Statistic     Statistic     Notes     Statistic     Notes       151 01 10     Statistic     Statistic     Statistic     Statistic     Statistic     Statistic       151 01 10     Statistic     Statistic     Statistic     Statistic     Statistic     Statistic       161 10     Statistic     Statistic     Statistic     Statistic     Statistic     Statistic       161 10     Statistic     Stati	PUSKAI 14501-															1211	
EEOUM       COMPLETED PAILLER       PAILL RACE AND WORL       SIZE       PORTUGE       ACC (FT.)       TOTAL 0       9.0         CORE       ECOVERY (FT.AL)       CORE BOXESSAMULES[L]. TOP CASIME GROUND EL.       PEPTIALL CORLUM MATES       PEPTIALL CORLUM MATES       PEPTIALL TOP OF ROCE         140       Ibs. /18       Inchard       None       Richard Migues       MOTES       NOTES         140       Ibs. /18       Inchard       None       Richard Migues       MOTES       NOTES	1	. –		5S-1	Lodi M	unicin	al Pa	irk	COORDINA	ATES		N 1070+ F 2437		A		BEARING	
CORE RECOVERY (FT.7.0)     CORE RECOVERY (FT.7.0)     CORE RECOVERY (FT.7.0)     Depth/EL. TOP OF ROCK       SAMUE NAMER METORT/ALL     CORE RECOVERY (FT.7.0)     Dest/16/EL. TOP OF ROCK     P       140 Ibs./18 Inches     Inches     None     Richard Migues       25 Bid Core ROCK     None     Richard Migues       26 Gid Rid View RETORT/ALL     Core ROCK     Richard Migues       26 Gid Rid View RETORT/ALL     Core ROCK     None     NOTES DOI:       26 Gid Rid View RETORT/ALL     Core ROCK     Richard Migues       26 Gid Rid View RETORT/ALL     Core ROCK     None     NOTES DOI:       26 Gid Rid View RETORT/ALL     Core ROCK     Richard Migues     NOTES DOI:       26 Gid Rid View RICK     Core ROCK     Richard Migues     NOTES DOI:       26 Gid Rid View RICK     Core ROCK     Core ROCK     NOTES DOI:       27 ST 10 10     Core ROCK     Core ROCK     Core ROCK       28 10 10     Core ROCK     Core ROCK     Core ROCK       28 10 10     St 10 10     Core ROCK     Core ROCK     Core ROCK       28 10 10     Core ROCK     Core ROCK     Core ROCK     Core ROCK       28 10 10     Core ROCK     Core ROCK     Core ROCK     Core ROCK       28 10 10     Core ROCK     Core ROCK     Core ROCK     Core ROCK </td <td>8</td> <td colspan="10">BEGUN COMPLETED DRILLER</td> <td></td> <td></td> <td></td> <td>TOTAL DEPTI</td>	8	BEGUN COMPLETED DRILLER													TOTAL DEPTI		
AMPLE NAME METOR/FALL       p       g																	9.0
SAMPLE HAWER LEGET/FALL       CASING LEFT IN HOLE 101A./LENGTH       LOGGED BY:       Richard Migues         140 IbS./18 Inches       None       Richard Migues         140 IbS./18 Inches       MATES       None         150 ISS       ISS IO       ISS IO       ISS IO         150 ISS       ISS IO       ISS IO       ISS IO       ISS IO         151 IO       ISS IO       ISS IO       ISS IO       ISS IO       ISS IO         161 IO       ISS IO														/EL. TOP	OF ROCK		
By Side 10       By Side 10 <td>s,</td> <td>MP</td> <td>LE H</td> <td>IAMME</td> <td>R WEIGHT</td> <td>T/FALL</td> <td>CAS</td> <td></td> <td>FT IN HO</td> <td>E: D</td> <td>IA./L</td> <td>ENGTH LOGGED BY:</td> <td></td> <td></td> <td></td> <td>/</td> <td></td>	s,	MP	LE H	IAMME	R WEIGHT	T/FALL	CAS		FT IN HO	E: D	IA./L	ENGTH LOGGED BY:				/	
100       1	_		140	Ibs	<u>./18 in</u>	ches		<del></del>	No	ne			1	Richard M	igues		
10       10       0.6.7         85       1.0       0.7         15       1.0       1.0         15       1.0       1.0         15       1.0       1.0         15       1.0       1.0         15       1.0       1.0         15       1.0       1.0         15       1.0       1.0         15       1.0       1.0         15       1.0       1.0         15       1.0       1.0         16       1.0       1.0         17       1.0       1.0         18       1.0       1.0         18       1.0       1.0         18       1.0       1.0         18       1.0       1.0         18       1.0       1.0         18       1.0       1.0         18       1.0       1.0         18       1.0       1.0         18       1.0       1.0         19       10       1.0         10       1.0       1.0         10       1.0       1.0         10       1.0       1.0	Д Ш Ш	Σ	길뿐			PR	ESSU	RE		_	ဗ္ဂ						
10       10       0.6.7         85       1.0       0.7         15       1.0       1.0         15       1.0       1.0         15       1.0       1.0         15       1.0       1.0         15       1.0       1.0         15       1.0       1.0         15       1.0       1.0         15       1.0       1.0         15       1.0       1.0         15       1.0       1.0         16       1.0       1.0         17       1.0       1.0         18       1.0       1.0         18       1.0       1.0         18       1.0       1.0         18       1.0       1.0         18       1.0       1.0         18       1.0       1.0         18       1.0       1.0         18       1.0       1.0         18       1.0       1.0         19       10       1.0         10       1.0       1.0         10       1.0       1.0         10       1.0       1.0	i	DIA	<u>a</u> l <u>o</u>		1000				ELEV.	H	HIG	DESCRIPTION	AND CL	ASSIFICA	TION		
10       10       0.6.7         85       1.0       0.7         15       1.0       1.0         15       1.0       1.0         15       1.0       1.0         15       1.0       1.0         15       1.0       1.0         15       1.0       1.0         15       1.0       1.0         15       1.0       1.0         15       1.0       1.0         15       1.0       1.0         16       1.0       1.0         17       1.0       1.0         18       1.0       1.0         18       1.0       1.0         18       1.0       1.0         18       1.0       1.0         18       1.0       1.0         18       1.0       1.0         18       1.0       1.0         18       1.0       1.0         18       1.0       1.0         19       10       1.0         10       1.0       1.0         10       1.0       1.0         10       1.0       1.0	٩ ۲	9	ΞĽ	Ц Ц Ц Ц Ц		STL	S.I.S	E LL		Ü	RAF					WATER	RETURN,
10       10       0.6.7         85       1.0       0.7         15       1.0       1.0         15       1.0       1.0         15       1.0       1.0         15       1.0       1.0         15       1.0       1.0         15       1.0       1.0         15       1.0       1.0         15       1.0       1.0         15       1.0       1.0         15       1.0       1.0         16       1.0       1.0         17       1.0       1.0         18       1.0       1.0         18       1.0       1.0         18       1.0       1.0         18       1.0       1.0         18       1.0       1.0         18       1.0       1.0         18       1.0       1.0         18       1.0       1.0         18       1.0       1.0         19       10       1.0         10       1.0       1.0         10       1.0       1.0         10       1.0       1.0	80	<u>s</u>	<u>G</u>			J o	<u> </u>	<b>Ε</b> Σ			Ø						
15       1.0       1.0         16       1.0       1.0         17       1.0       1.0         18       1.0       1.0         19       1.0       1.0         10       1.0       1.0         10       1.0       1.0         10       1.0       1.0	Ľ	<u> </u>	1.0	0.0		ļ						0.0-2.4 ft. <u>SAND</u> (10YR5/	S). Moder: (4); fine-to	ate yellowish medium-gra	ined.		
85       1.0       1.0         85       1.0       1.0         85       1.0       1.0         85       1.0       1.0         85       1.0       1.0         85       1.0       1.0         85       1.0       1.0         85       1.0       1.0         85       1.0       1.0         85       1.0       1.0         85       1.0       1.0         1.0       1.0       1.0         1.0       1.0       1.0         1.0       1.0       1.0         1.0       1.0       1.0         1.0       1.0       1.0         1.0       1.0       1.0         1.0       1.0       1.0         1.0       1.0       1.0         1.0       1.0       1.0         1.0       1.0       1.0         1.0       1.0       1.0         1.0       1.0       1.0         1.0       1.0       1.0         1.0       1.0       1.0         1.0       1.0       1.0         1.0       1.0       1.0											-	19-24 ft - com		a		0.0-9.0 f	t. using 3"
85       1.0       1.0         55       1.0       1.0         55       1.0       1.0         55       1.0       1.0         55       1.0       1.0         55       1.0       1.0         55       1.0       1.0         55       1.0       1.0         55       1.0       1.0         55       1.0       1.0         55       1.0       1.0         58       1.0       1.0         58       1.0       1.0         58       1.0       1.0         58       1.0       1.0         58       1.0       1.0         58       1.0       1.0         58       1.0       1.0         58       1.0       1.0         58       1.0       1.0         58       1.0       1.0         58       1.0       1.0         58       1.0       1.0         58       1.0       1.0         59       1.0       1.0         50       1.0       1.0         50       1.1       1.0				1					1 11			- 2.4-3.0 ft. SILTY S	SANDY C	LAY	[		•
SS       1.0       1.0         SS       2.0       1.0	s	s	1.0	1.0		{			-	.		(CL-ML). Dusk	y yellowis	h brown		radioacti contamii	ive nation and
SS       1.0       1.0	S	s	1.0	1.0						5_		3.0-3.3 ft. SAND (1	S). Modern	ate yellowish		by Eberl	line-TMA
SS       1.0       1.0	S	s	1.0	1.0							1				ined.	Corpora	tion.
SS       1.0       1.0       4.0-9.0 ft. SAND (5). Pale yellowish observed; burned;									Z	z		Brownish gray (	(5YR6/2);	fine-to			
SS = SPLI1 SPOON; SI = SHELBY TUBE;     SITE     SITE     Note: The first same stand close of samples by visual examination.	S	s	1.0	1.0					4			-		ellowish	J	8.0 ft. gr observed	ound water l.
SS = SPLIT SPOON; ST = SHELBY TUBE;       \$17E       \$17E       Hole Point States       Hole Point												dark yellowish o	2); fine-to brange.	medium-gra	ined;		
SS = SPLIT SPOON; ST = SHELBY TUBE; SITE HOLE NO.												1 8.2-8.4 ft. scatt	tered well i	rounded smal	1	was hand	d collected
Bottom of hole at 9.0 ft. Hole grouted,         12-8-87.         Bottom of hole at 9.0 ft. Hole grouted,         12-8-87.         Bottom of hole at 9.0 ft. Hole grouted,         Description and classification of ao sample by visual examination.         SS = SPLIT SPOON; ST = SHELBY TUBE;         SITE         HOLE NO.												8.4-9.0 ft., dark	yellowish	orange		taken in	the interval
Image: Signal and Signal an													· · · · · · · · · · · · · · · · · · ·	• • • • • •		0.0-0.5 1	
SS = SPLIT SPOON; ST = SHELBY TUBE; SITE HOLE NO.												Bottom of hole at 9 12-8-87.	9.0 ft. Hol	e grouted,			
SS = SPLIT SPOON; ST = SHELBY TUBE; SITE HOLE NO.																	
SS = SPLIT SPOON; ST = SHELBY TUBE; SITE HOLE NO.																	
SS = SPLIT SPOON; ST = SHELBY TUBE; SITE HOLE NO.																	
SS = SPLIT SPOON; ST = SHELBY TUBE; SITE HOLE NO.									_								
SS = SPLIT SPOON; ST = SHELBY TUBE; SITE HOLE NO.																:	
SS = SPLIT SPOON; ST = SHELBY TUBE; SITE HOLE NO.																	
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SS = SPLIT SPOON; ST = SHELBY TUBE; SITE HOLE NO.																	
SS = SPLIT SPOON; ST = SHELBY TUBE; SITE HOLE NO.															-	_	
SS = SPLIT SPOON; ST = SHELBY TUBE; SITE HOLE NO.																classificat	tion of soil
	4									i							
	ss		SPL I	IT SP	DON; ST	= SHEL	BY TU	BE; SI	TE.					<u> </u>			
D = DENNISON; P = PITCHER; O = OTHER MISS-Lodi Municipal Park 1211									<u>من من الوال مارا الم</u>	M	ISS	-Lodi Munici	ipal Pa	ark	١		

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