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Environmental Restoration Program

SUBSURFACE UTILITY EVALUATION OPERABLE UNIT 2, MAIN HILL OU-2 PHASE I TECHNICAL MEMORANDUM

MOUND PLANT
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EG&G Mound Applied Technologies

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LIST OF ACRONYMS
MOUND PLANT, ER PROGRAM

ADT	American District Telegraph
AEA	Atomic Energy Act
AEC	Atomic Energy Commission
AST	Aboveground Storage Tank
AUST	Active Underground Storage Tank
AUSTP	Active Underground Storage Tank Program
BUSTR	Bureau of Underground Storage Tank Registration
CAD	Computer Aided Drafting
CFR	Code of Federal Regulations
CIP	Cast Iron Pipe
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CMP	Corrugated Metal Pipe
CWA	Clean Water Act
D&D	Decontamination & Decommissioning
DOE	U.S. Department of Energy
DQO	Data Quality Objectives
EG&G MAT	EG&G Mound Applied Technologies
EPA	Environmental Protection Agency
ER	Environmental Restoration (Program)
ERS	Effluent Removal System
FFA	Federal Facility Agreement
gpd	Gallons per Day
gpm	Gallons per Minute
HP	Health Physics
ID	Identifier
NPDES	National Pollutant Discharge Elimination System
NPL	National Priority List
OU	Operable unit
PID	Photo Ionization Detector
psi	Pounds Per Square Inch
PVC	Polyvinyl Chloride
RI/FS	Remedial Investigation/Feasibility Study
RI	Remedial Investigation
SM/PP	Special Metallurgical/Plutonium Processing
TV	Television
USTs	Underground Storage Tank

VCP	Vitrified Clay Pipe
VCR	Video Cassette Recorder
WP	Work Plan

EXECUTIVE SUMMARY

The objectives of the Operable Unit 2 (OU-2) Remedial Investigation/Feasibility Study (RI/FS) are to define the nature and extent of the contamination found on the Main Hill, characterize the risks to human health and the environment posed by exposure to the various affected medium, and to evaluate the potential remedies that could reduce these risks to acceptable levels. Phase I of the OU-2 Remedial Investigation (RI) was initiated in April 1994. Phase I is the reconnaissance investigation and was conducted to collect information and assist in preparing the scope of work for the remaining phases of the investigation. This report provides a discussion of the subsurface utility evaluation portion of the OU-2 Phase I, RI investigation activities.

Storm and Sanitary Sewers

The objectives of this subtask were to produce a map showing the locations of the storm and sanitary sewer lines within OU-2; confirm the locations by field verification and location surveying; evaluate the integrity of the storm and sanitary sewers by a video survey; and produce a map identifying potential areas of leakage from the storm and sanitary sewers.

Storm and sanitary sewer drawings were obtained from Mound Plant's Computer Aided Drafting (CAD) Department. A field reconnaissance was performed on the storm and sanitary sewer manholes to verify their locations, determine the accuracy of the drawings provided by Mound Plant, and identify manholes of questionable integrity. Several manholes were identified during the field reconnaissance that had been removed, relocated, or were of questionable integrity

A location survey was conducted to assist in preparation of the map of the storm and sanitary sewers within OU-2. Surveying activities precisely located the storm and sanitary sewer manholes, storm sewer outfalls, headwalls, and storm drains. The surveyed locations were compared to the drawings provided by Mound Plant to verify their accuracy. Surveyed locations were incorporated into the storm and sanitary sewer drawings to produce a map of the storm and sanitary sewers.

The video survey revealed information regarding the condition of the storm and sanitary sewer lines in OU-2. Out of the 5,916 feet of sanitary sewers and 14,291 feet of storm sewers that were at least eight inches in diameter, 3,410 feet of sanitary and 8,329 feet of storm lines were video surveyed. The video survey documented potential leakage areas from the storm and sanitary sewers. Observations that were documented during the video inspection include offset joints, separated joints, circular cracks, longitudinal

cracks, surface cracks, possible leaky joints, pipe changes, crushed pipes, holes, missing pieces of pipe, holes, unmapped service connections, eroded pipes, bellies, and roots in the pipes.

Locations and types of defects were synthesized to produce a map of potential leakage areas. To identify whether these areas are leaking, additional investigation of the storm and sanitary sewers should be performed. The map of potential leakage areas will be used during RI scoping activities to identify areas for additional investigation. The scope of the additional investigations will be addressed in the OU-2 RI Phase I Reconnaissance Summary Report.

Fire and Domestic Water Lines

The objectives for the fire and domestic water supply lines were to obtain maps showing the locations of pressurized lines, confirm their locations by field verification where possible, evaluate the integrity of the lines, and produce a map identifying the potential areas of leakage from the pressurized lines.

Fire and domestic water supply line drawings were compiled from the CAD Department at Mound Plant. Drawings were reviewed to identify the locations of the fire and domestic water supply lines. Since these systems are underground, verification of their locations by field reconnaissance was not possible.

Pressure line testing was proposed for the fire and domestic water supply lines to determine their integrity and to evaluate if were contributing fluids to the subsurface. Due to several factors, it was decided not to perform this type of testing on the pressurized lines.

Mound personnel reported that the standard leakage rate for Mound Plant's fire water supply system is 4.5 gallons per minute. This leakage rate calculated over a one year period would amount to 2.3 million gallons of water that are lost from the fire water supply lines. In addition, the normal leakage rate occurs over the entire Mound Plant is not limited to just OU-2. The exact amount of water that is contributed to the subsurface within the boundaries of OU-2 is unknown. Additional investigation on the fire lines is necessary to determine the quantity of water that is being contributed to the subsurface within OU-2 and in what areas or locations.

Hazardous Waste Lines

Objectives for the hazardous waste lines investigation were to produce a map of their locations and confirm their locations by field verification. These maps will be used in future RI phases to assist in determining if water has the potential to move laterally along their underground trenches.

Hazardous waste line drawings were compiled from the CAD Department at Mound Plant. Field reconnaissance did not identify any new, relocated, or removed hazardous waste line structures. Exact locations of these lines are being surveyed under OU-6. The hazardous waste lines will be evaluated, in future phases, to determine if water has the potential to move laterally along these lines.

Electric, ADT, and Telephone Lines

Objectives for the electric lines, American District Telegraph (ADT) lines, and telephone lines investigation were to obtain maps of these utilities and confirm their locations by field verification. These maps will be used in future RI phases to assist in determining if water has the potential to move laterally along their underground trenches.

Electric, ADT, and telephone line drawings were compiled from the CAD Department at Mound Plant. The drawings were reviewed to identify the locations of these lines. Field reconnaissance was performed in an attempt to verify the accuracy of the electric, ADT, and telephone line drawings but due to the layout of the three systems, field verification was not possible. The electric, ADT, and telephone lines will be evaluated, in future phases, to determine if water has the potential to move laterally along these lines in the underground trenches.

Utility Trenches

The objectives for the utility trench investigation were to identify utility trenches that could be sources of or transport mechanisms of contamination. Drawing review identified six underground utility trenches located by Buildings OSW, A, P, PS, 26 and R. Site reconnaissance was performed to verify the existence of the six utility trenches identified in the drawing review. Two utility trenches were verified and conformed to the provided drawing. The other four utility trenches could not be verified by field reconnaissance. The utility trenches will be evaluated, in future phases, to determine the affect of these trenches on the subsurface environment.

Surface Drainage

Objectives of this subtask were to obtain a map of the OU-2 surface water drainage and determine the areas of potential infiltration to the groundwater from the surface water drainage system. Surface drainage drawings were compiled from the CAD Department at Mound Plant and a drawing review was conducted to identify the surface drainage structures in OU-2. Field reconnaissance verified the accuracy of the

surface water drainage map provided by Mound Plant. The surface water drainage map was updated to incorporate new and relocated surface water drainage structures.

Field reconnaissance identified 18 potential infiltration areas to the subsurface. Further investigations of the potential areas of infiltration should be conducted to determine if these areas act as a migration route to the subsurface. These additional investigations may require soil sampling, soil vapor analysis, and dye tracing of the surface water to the subsurface. Additional investigations will be addressed in the OU-2 Phase I Reconnaissance Report.

Active Sumps and Tanks

The objectives of this subtask were to evaluate the integrity of the active underground sumps and tanks within OU-2 and assess their potential to affect the subsurface environment. Previous investigations were reviewed to create a database of the OU-2 sumps and tanks. This database contains information regarding the sumps and tanks in OU-2 and includes active and inactive sumps and tanks. This OU-2 sump and tank database was reviewed to identify the active sumps and tanks within OU-2. This review identified 48 active sumps and tanks in OU-2.

Visual inspection was performed where possible on these active sumps and tanks. Visual inspection identified four tanks with visible staining and stressed vegetation. These four tanks are underground storage tanks that contain fuel oil and are located by the P Building. These four tanks are scheduled for removal in the 1994 as part of the Active Underground Storage Tank Program (AUSTP).

The OU-2 sump and tank inspection identified two tanks that were previously reported as being in A Building. Their actual location is outside the South entrance to OSE Building. This investigation also identified two sumps that were not previously documented. One is located outside P Building and collects boiler blow down water. The other is located in the WD Building in room 12. The function of this sump is not known. An additional 13 sumps and tanks and two possible sumps were identified during a drawing review. The number and location of these sumps and tanks are as follows: five sumps in P Building, one sump in A Building, one sump in C, six sumps in SW Building, and two possible sumps in R Building. Mound Plant's AUSTP is responsible for assigning sumps and tanks to the appropriate regulatory and corresponding EG&G Mound Applied Technologies (EG&G MAT) program. The AUSTP should confirm the status of the sumps and tanks that were identified during the OU-2 investigation and assign them to the appropriate program.

To evaluate which, if any, active sumps and tanks warrant additional investigation, a ranking system was developed based on the information that existed for each sump and tank. Each active sump and tank was ranked in 5 different categories based on the U.S. Environmental Protection Agency (EPA) requirements for new underground storage tanks (40 CFR Parts 280 and 281). Ranking categories included the tank material type, tank cathodic protection, spill overflow protection, tank release detection, and piping release detection. In each category, the choices were ranked based on their compliance with EPA requirements.

If a tank met all of the EPA requirements for new underground storage tanks, the total possible score was 30 points. If a tank scored at least 20 points (66%), the integrity of the tank was considered acceptable. Out of the 29 active sumps and tanks ranked, nine were rated as having acceptable integrity. Out of the 20 rated with unacceptable integrity, there are 11 tanks and 9 sumps. To confirm the integrity of the sumps and tanks that were ranked as having questionable integrity, additional investigations, which may include hydrostatic, volumetric, or pressure testing, should be performed.

Inactive Sumps and Tanks

Sumps and tanks that have been removed from service within OU-2 were to be assessed to evaluate whether the closure activities and verification sampling performed meet the Data Quality Objectives (DQOs) established in the OU-2 RI/FS WP. The OU-2 sump and tank database was reviewed to identify the inactive sumps and tanks. This review identified 33 inactive sumps and tanks located within OU-2. From the inactive sumps and tanks, the removed tanks were identified. There were seven sumps and tanks in OU-2 that fall under this category.

When a sump or tank was removed from service, the results of the Decontamination and Decommissioning (D&D) program activities or other Mound Plant programs were to be assessed to determine that the verification sampling performed meets the DQOs. Verification sampling and closure documentation, as reported by Mound Plant personnel, does not exist for the seven removed sumps and tanks within OU-2. Five of these sumps and tanks are assigned to the ER program under OU-2. These five sumps and tanks have been given a level I category under the OU-2 RI/FS. The level I category includes all OU-2 areas that are not sufficiently addressed in any other Operable Unit and require further investigation and sampling. These tank locations are discussed in the OU-2 RI/FS WP and will be addressed in the OU-2 Phase I Reconnaissance Summary Report. Two removed sumps and tanks are currently assigned to the D&D program and will be verified under OU-6.

Twelve sumps and tanks were identified as closed-in-place (filled with gravel or concrete). Fourteen sumps and tanks were identified as not-in-service; these tanks are assigned to the D&D program.

One tank was identified during the Dames & Moore (1994) investigation by means of a drawing review. No information was found indicating whether the tank was removed or if verification sampling was performed. It was proposed that the tank be assigned to the D&D program. Based on the substance stored in the tank and lack of information regarding the tank, it is recommended that this tank be assigned to the Environmental Restoration (ER) program for further investigation. This tank will be addressed in the OU-2 Phase I Reconnaissance Summary Report.

Aboveground Storage Tanks

Objectives of this subtask were to evaluate the integrity of the Aboveground Storage Tanks (ASTs) within OU-2 and assess their potential to affect the subsurface environment. Visual inspection was performed on the ASTs located within OU-2. This inspection was performed to evaluate if the tanks had the potential for a release from these units. Twenty ASTs were identified during the field investigation. The majority of the tanks were process tanks, including seven liquid nitrogen tanks, one argon, and one propane tank. Four Effluent Removal System (ERS) tanks were also identified in the inspection. Two diesel fuel storage tanks and two chemical storage tanks were also identified during the visual inspection. Three potable water tanks were not included in this inspection.

The visual inspection identified two ASTs that warrant additional investigation. The first area is near AST-11, which supplies generator #4 with diesel fuel. Visible staining was observed near this AST. The second area is near AST-17, which had a ruptured bottom. The AST contents could not be identified at the time of the investigation, however, because the area around the AST was roped off and marked caustic. These two ASTs will be addressed in the OU-2 Phase I Reconnaissance Summary Report.

SECTION 1

1. INTRODUCTION

1.1. SITE BACKGROUND

Mound Plant originated as part of the Manhattan Engineer District in 1943; its purpose was to determine the chemical and metallurgical properties of polonium (DOE 1986). The site is approximately 10 miles south-southwest of Dayton and 45 miles north of Cincinnati.

Mound Plant occupies 306 acres within the southern city limits of Miamisburg, Ohio (Figure 1.1). The northern boundary of Mound Plant is approximately 0.13 mile south of Mound Avenue in Miamisburg. Mound Avenue curves south, becomes Mound Road, and runs southward along the western boundary of the plant. Benner Road forms the southern boundary of Mound Plant, and the Conrail Railroad, formerly the Penn-Central, roughly parallels the western boundary at distances of about 50 to 200 ft (MRC 1985). A railroad siding enters the plant from the west and services the lower plant valley.

There are currently more than 100 buildings on the site and total floor space exceeds 925,000 ft^2 (MRC 1985). Most of the buildings are located on the northwest high area known as Main Hill. Usages of the buildings are described in the Mound Site Development Plan (MRC 1985). Buildings on the Main Hill include administrative offices, machine tool and maintenance shops, nuclear and advanced device production and development facilities, a cafeteria, a library, a powerhouse, and other utilities (MRC 1985). The southern part of the property is undeveloped except for an unpaved parking lot.

Early Mound Plant programs investigated the chemical and metallurgical properties of polonium-210 and its applications, particularly the fabrication of neutron and alpha sources for weapon and non-weapon use. Investigations involving uranium, protactinium-231, and plutonium-239 were performed from 1950 to 1963 as part of the national civilian power reactor program. In 1954, separation of the stable isotopes of noble gases began. Development of plutonium-238 heat sources started at Mound Plant in 1961 because of its high specific activity and relatively short half-life (87.74 years). Since that time, heat sources fueled with plutonium-238 have been developed and fabricated.

The first of several programs requiring tritium-handling technology was initiated in 1958. Mound Plant had an extensive capability for handling and studying tritium and tritium compounds for weapons and non-weapons applications. A facility was used for the recovery and purification of tritium from all types of wastes generated at U.S. Department of Energy (DOE) sites which handle tritium. Facilities were also used for the development of tritium-containing materials and processes for weapons applications and possible manufacture (MRC 1985).

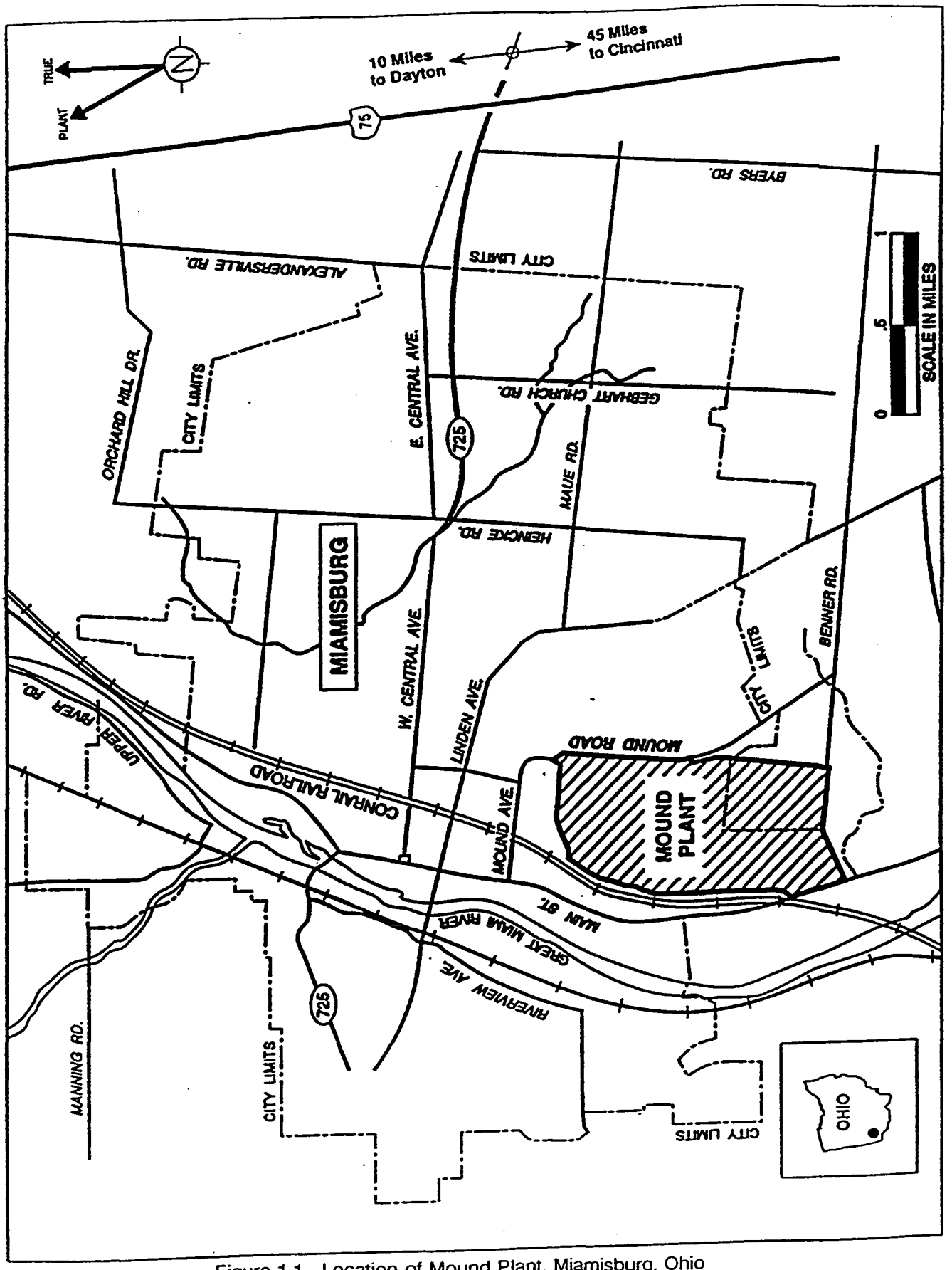


Figure 1.1. Location of Mound Plant, Miamisburg, Ohio

Mound Plant uses a wide variety of chemicals and in the past generated approximately 20,000 gallons of hazardous wastes per year, including organic solvents, waste oils, corrosives, spent plating bath solutions, explosive wastes, and laboratory wastes. Currently, there is no storage of either chemical products or hazardous wastes in underground storage tanks (USTs). USTs at Mound Plant are used for storage of fuel oil, diesel fuel, low-level radiological wastewater, and sanitary/industrial wastewater (NUS 1989).

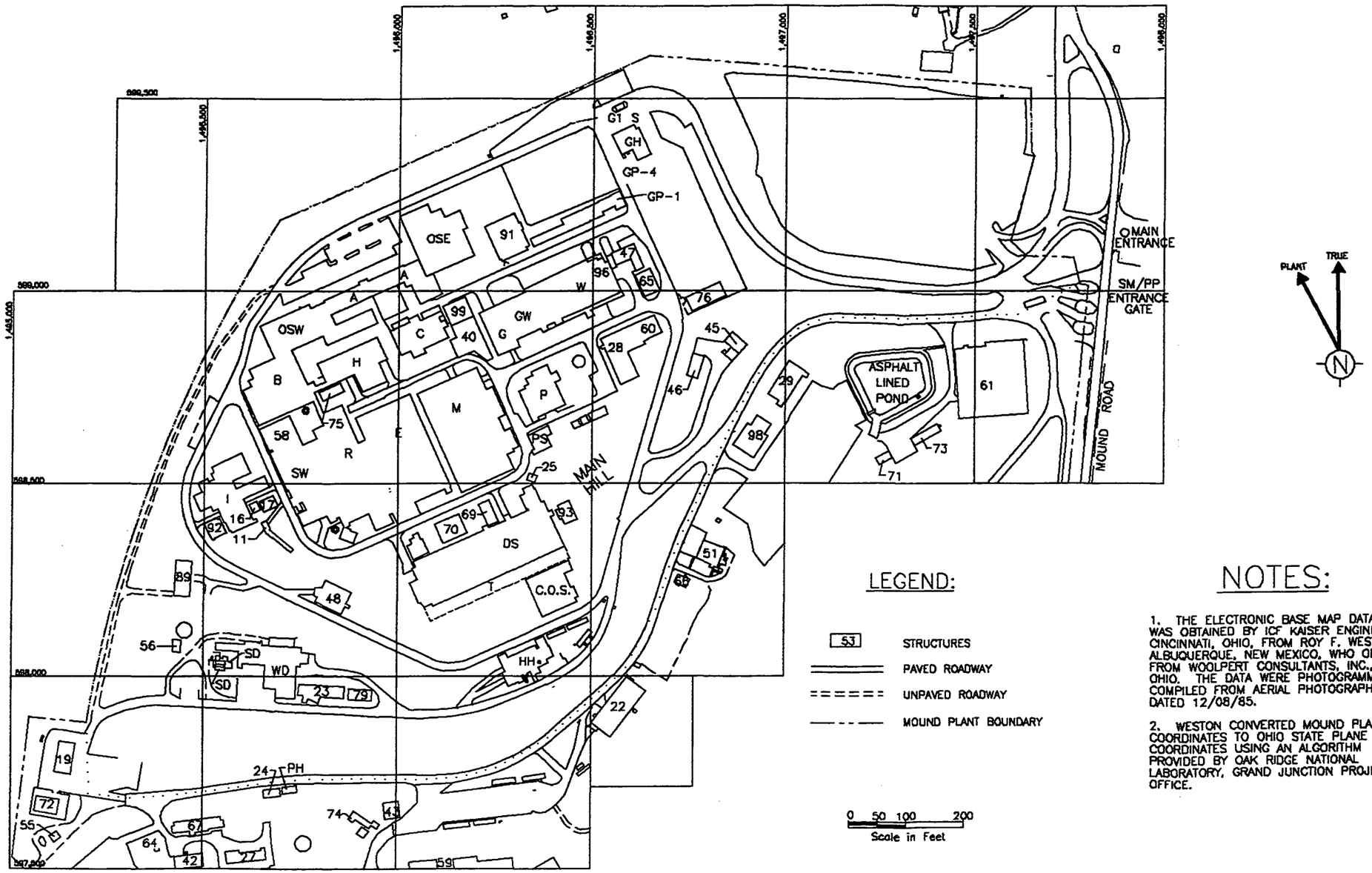
Mound Plant was placed on the CERCLA (Superfund) National Priority List (NPL) in November, 1989. Pursuant to that status, a CERCLA Section 120 Federal Facility Agreement (FFA) was signed between DOE and U.S. Environmental Protection Agency (EPA) (Administrative Docket Number V-W-90-C-075), and became effective October 12, 1990. A Remedial Investigation/Feasibility Study (RI/FS) was initiated at Mound to characterize the nature and extent of risks faced by uncontrolled hazardous waste and for evaluating potential remedial options.

In response to being placed on the NPL, an Environmental Restoration (ER) Program was initiated by DOE at Mound to fulfill its obligations under the FFA. Historically, the ER program at Mound Plant subdivided the site into nine Operable Units. These original nine units were subsequently consolidated into five broad geographic operable units in December 1992 (OU-1, OU-2, OU-5, OU-6 and OU-9). The Main Hill of Mound Plant (Figure 1.2) is Operable Unit 2 (OU-2) and comprises the portion of the site where the majority of the research and manufacturing took place.

1.2. OU-2 RI/FS OBJECTIVES

The objectives of the OU-2 RI/FS are to define the nature and extent of the contamination found on the Main Hill, characterize the risks to human health and the environment posed by exposure to the various affected medium, and to evaluate the potential remedies that could reduce these risks to acceptable levels. Phase I is the reconnaissance investigation and was conducted to collect information and assist in preparing the scope of work for the remaining phases of the investigation. Phase I of the OU-2 Remedial Investigation (RI) was initiated in April 1994. Phase II is a source confirmation investigation and will include surface and subsurface soil sampling and an investigation of monitoring well 0034. Phase III is a nature and extent investigation that will include the installation of groundwater monitoring wells, a groundwater quality investigation, and the characterization of seeps and foundation drains.

This report provides a discussion of the subsurface utility evaluation portion of the OU-2 Phase I, RI activities. The objectives of this subsurface utility evaluation are as follows:



NOTES:

1. THE ELECTRONIC BASE MAP DATA FILE WAS OBTAINED BY ICF KAISER ENGINEERS, CINCINNATI, OHIO, FROM ROY F. WESTON, INC., ALBUQUERQUE, NEW MEXICO, WHO OBTAINED IT FROM WOOLPERT CONSULTANTS, INC., DAYTON, OHIO. THE DATA WERE PHOTOGRAMMETRICALLY COMPILED FROM AERIAL PHOTOGRAPHY DATED 12/08/85.

2. WESTON CONVERTED MOUND PLANT COORDINATES TO OHIO STATE PLANE COORDINATES USING AN ALGORITHM PROVIDED BY OAK RIDGE NATIONAL LABORATORY, GRAND JUNCTION PROJECT OFFICE.

Figure 1.2. Mound Plant, Main Hill Buildings

- produce a map(s) showing the locations of storm and sanitary sewer systems;
- confirm the storm and sanitary sewer locations by field verification and location surveying;
- evaluate the integrity of the storm and sanitary sewers;
- produce a map to identify potentially defective areas of storm and sanitary sewer lines;
- produce a map(s) showing the locations of the pressurized lines;
- confirm the pressurized line locations by field verification and/or location surveying;
- evaluate the integrity of the pressurized lines;
- produce a map identifying the potential areas of leakage from the pressurized lines;
- confirm the locations of the other subsurface utility locations by field verification and/or location surveying;
- produce a map(s) of other subsurface utilities to evaluate, in future phases, if water has the potential to move laterally along their underground trenches;
- produce a map of the OU-2 lined and unlined surface drainage structures, perform a reconnaissance survey on the lined and unlined surface drainage structures to identify areas of potential leakage or infiltration to the subsurface;
- produce a map(s) of the sumps and tanks within OU-2;
- perform a visual inspection of the active underground sumps and tanks and aboveground tanks to evaluate their integrity; and
- evaluate the results of the Decontamination and Decommissioning (D&D) activities on the removed sumps and tanks and assess whether the verification sampling performed meets the Data Quality Objectives (DQOs) established in the OU-2 RI/FS Work Plan (WP).

1.3. ORGANIZATION OF REPORT

This document is the subsurface utility evaluation for the Main Hill, OU-2, at Mound Plant. The following sections are included in the remainder of this document.

- Section 2 includes results of the field reconnaissance and video survey of the storm and sanitary sewer systems, and an evaluation of the structural integrity of the surveyed portions of the sewer lines. Maps of new or modified sewer manholes and lines, and of video survey results are included.
- Section 3 provides results of field reconnaissance of other subsurface utilities within OU-2, including pressurized water lines (fire supply and domestic water), hazardous waste lines, electric lines, ADT lines, telephone lines, and utility trenches.
- Section 4 includes results of field reconnaissance of lines and unlined surface drainage structures in OU-2, and an evaluation of areas identified as being potential infiltration

pathways. Surface drainage features, including potential infiltration areas, are identified on an updated surface drainage map.

- Section 5 includes results of visual inspections of underground sumps and tanks, as well as aboveground tanks, and an evaluation of active sump and tank integrity. This section also includes a database constructed as part of the integrity evaluation, and maps showing inactive and active sump and tank locations, discrepancies with previous investigations (mislocated sumps and tanks, sumps and tanks not previously mapped), and aboveground tank locations.

- Section 6 is the summary of results from this Phase I RI subsurface utility evaluation.

SECTION 2

2. STORM AND SANITARY SEWERS

2.1. OBJECTIVES

The objectives of this subtask were to produce an accurate map showing the locations of the storm and sanitary sewer lines within OU-2; confirm the locations by field verification and location surveying; evaluate the integrity of the storm and sanitary sewers; and produce a map identifying potential areas of leakage from the storm and sanitary sewers. The selected method to evaluate the storm and sanitary sewers lines was video surveying.

2.2. BACKGROUND

The subsurface utilities at Mound Plant were investigated in 1982 and 1988 for structural integrity by cleaning the utilities and performing a video survey. The investigation of subsurface utilities in 1982 was conducted only on the sanitary sewers (EUS 1983). The investigation of subsurface utilities in 1988 was conducted on the storm and sanitary sewer lines.

Repair and replacement of sanitary sewer lines identified in the 1982 structural integrity survey were not initiated until 1988. At that time, it was discovered that some repairs had been made between 1982 and 1988. To determine which areas had been repaired the sewer lines were video surveyed a second time. This video survey included both the storm and sanitary sewer systems. Additional videos were taken after the repairs were made to verify the integrity of the repairs. Figure 2.1 shows the sewer lines within the OU-2 boundary that were repaired or replaced in 1988.

The lines that were found to be in poor condition (e.g. crushed pipe, cracked pipe, pieces of pipe missing, etc.) were either replaced or Insitu-formed™. When lines are Insitu-formed™ they are internally lined with a resin like substance that hardens after a few hours. This essentially is a pipe within a pipe without joints and a smooth surface that improves flow characteristics.

2.3. SUMMARY OF ACTIVITIES

2.3.1. Collection of Existing Maps and Drawings

Storm and sanitary sewer drawings were obtained from Mound Plant's Computer Aided Drafting (CAD) Department in an electronic format. These drawings were the basis for the storm and sanitary sewer evaluation.

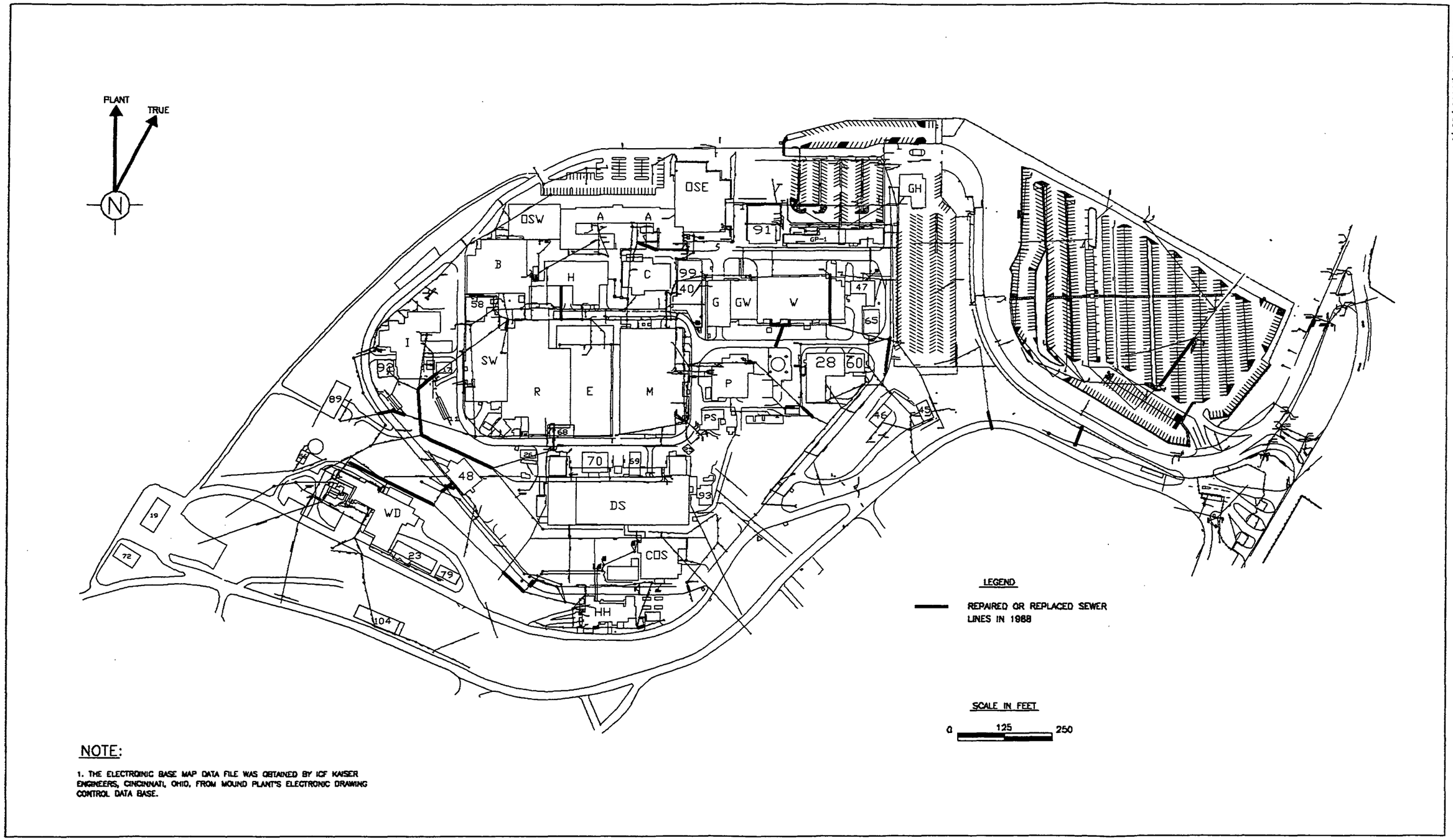


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Figure 2.1. Storm and Sanitary Lines Repaired Based on the 1988 Video Survey

2.3.2. Field Reconnaissance

A field reconnaissance was performed on the storm and sanitary sewer manholes to verify their locations and to determine the accuracy of the drawings provided by Mound Plant.

The storm and sanitary drawings provided by Mound Plant for the Main Hill were divided into 11 blocks. These 11 blocks simplified the field reconnaissance process for locating and identifying the storm and sanitary sewers. This block system is presented in Figure 2.2. Deviations, including new manholes that were not on the drawings, manholes that were not located, and manholes that were in different locations, were recorded on the set of drawings and in the field reconnaissance log book.

Every manhole on the utility drawing was assigned a unique identifier (ID). New and relocated manholes were recorded on the storm and sanitary drawings and assigned an ID. The ID was written on the utility structure with a semi-permanent marker. A summary of the utility structure identifier system is further described in Table II.1.

A portable Organic Vapor Analyzer (HNu Photo-Ionization Detector (PID) Model 101) was used to screen each manhole before the cover was removed. When possible, the these locations were screened by inserting a probe through holes in the manhole cover and recording the reading in the field reconnaissance log book. When the manhole cover did not have any holes, the screening was performed by opening the cover enough to insert the probe beneath the cover. The manhole covers were removed using pry bars and manhole hooks. Open utilities such as storm drains and storm sewer outfalls were also screened.

After the manhole cover was removed, the following items were noted: type of construction, condition, flow, number of inflow and outflow pipes, and pipe size. When observed, poor conditions and deviations from the Mound Plant drawings were noted in the field book.

Some manholes were not inspected because the covers were welded or bolted shut, while others had immovable objects covering them. Also, access to some Mound Plant areas was restricted; investigation of those manholes located within restricted areas was not performed. These areas included inside buildings, construction areas, and D&D areas. Attempts will be made to address these manholes during future work.

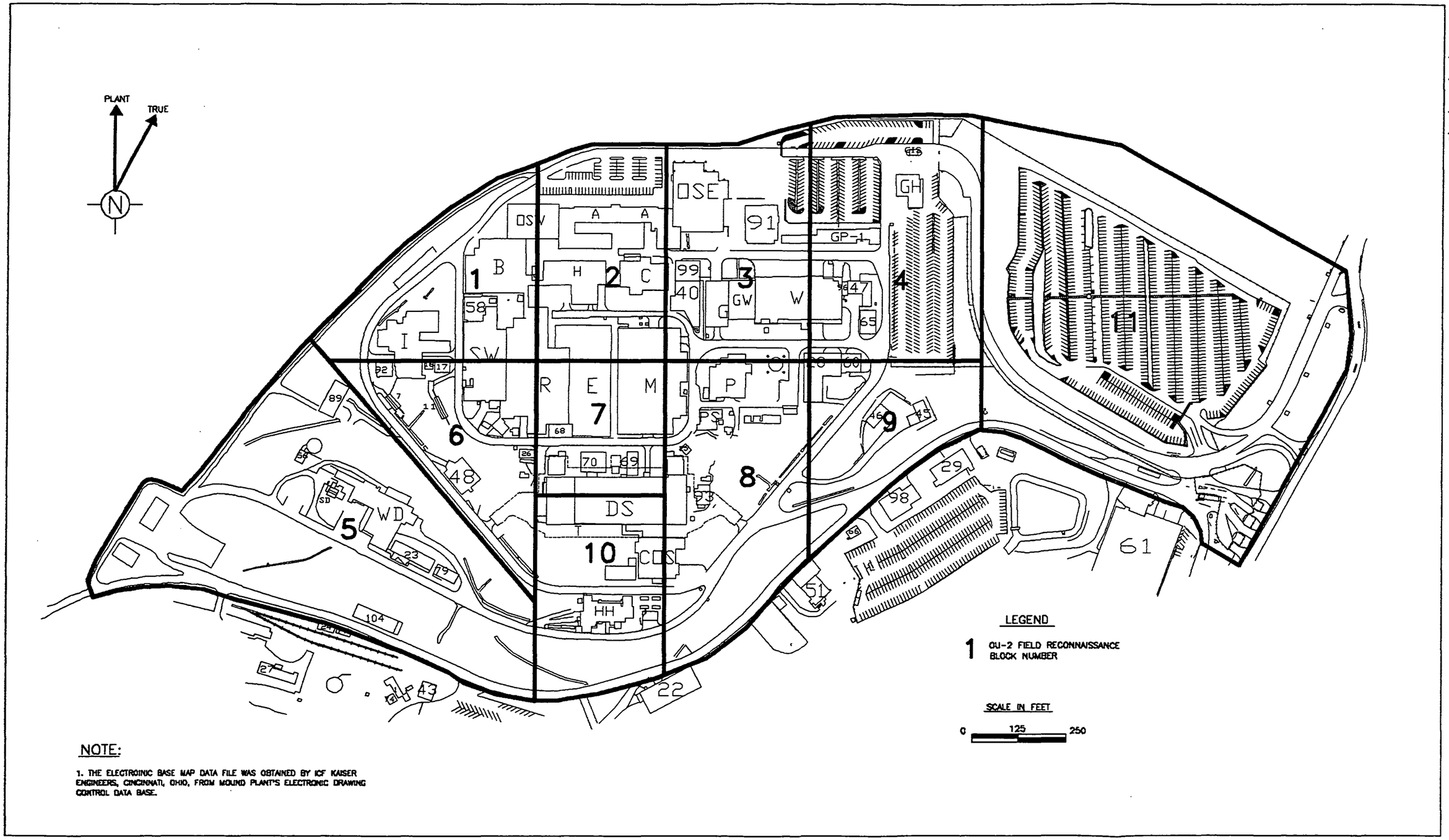

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Figure 2.2. OU-2 Field Blocks

Table II.1. Utility Structure Identification System

AAAAA-BB-CCC = Generic Sample Number for the OU-2 Subsurface Utility Investigation

AAAAA = The type of utility structure.

LSD	= Lined Surface Drainage
USD	= Unlined Surface Drainage
MHSAN	= Sanitary Manhole
MHSS	= Storm Sewer Manhole
SSO	= Storm Sewer Outfall
HW	= Storm Sewer Headwall (inlet)
SD	= Storm Drain
MHHW	= Hazardous Waste Manhole

BB = The field block location identifier (1 through 11). OU-2 was divided into eleven blocks for field identification of the utility structures.

CCC = The utility structure number per field block (i.e. 001, 002, 003, 101, 203, etc.).

Examples:

LSD-03-002	=	The 2nd lined surface drainage in field block 3
USD-11-010	=	The 10th unlined surface drainage in filed block 11.
MHSAN-01-015	=	The 15th sanitary manhole in block 1.
MHSS-05-024	=	The 24th storm sewer manhole in block 5.
SS0-06-011	=	The 11th storm sewer outfall in block 6.
HW-08-034	=	The 34th head wall in block 8.
SD-09-022	=	The 22nd storm sewer storm drain in block 9.
MHSS-07-101	=	A storm sewer manhole in block 7 not located during the field reconnaissance. Assigned an ID in the 100 series to avoid duplication between field crew and the original IDs assigned during the field reconnaissance.

2.3.3. Utility Integrity Evaluation

Storm and sanitary sewer lines, eight inches in diameter or larger were cleaned and video taped in order to begin to evaluate the integrity of these lines.

2.3.3.1. Cleaning

The intent of cleaning the storm and sanitary sewer lines was to remove foreign materials and restore the lines to a minimum of 95% of the original carrying capacity. Since the success of the video survey was dependant on the cleanliness of the lines, this phase was essential.

These lines were cleaned using a vactor/rodder (vactor) truck. The vactor truck has cleaning capabilities of 80 gallons per minute at 2,200 pounds per square inch with interchangeable attachments for cleaning different size lines. It is equipped with a two stage fan that can vacuum at 4000 cubic feet of air pressure per minute, through an eight inch suction line.

Each manhole was screened for organic vapors using a PID, and by Mound Plant Health Physics (HP) personnel for radioactive sources prior to cleaning. A water hose with nozzle head was placed in the sewer line facing in the upstream direction. Water forced out the back of the nozzle head propelled the entire assembly up the sewer, and also flushing debris from the line.

Debris flushed from the line was collected in the next downstream manhole or catch basin and removed with a vacuum hose. Debris removed was temporarily held in a 600 gallon tank on the vactor truck. Water from the tank was drained via a six inch hose directly into the sanitary sewer system for treatment on site. A sample of the debris in the tank was taken by Mound Plant's HP department and was counted for radioactive isotopes. Upon approval from HP, the debris was disposed of at the soil spoils area.

2.3.3.2. Video Inspection

The video inspection was conducted using an ARIES inspection system. This system consists of an ARIES color video camera, and lighting, mounted on a platform with adjustable rubber tracks. The unit was connected to the surface by a power and video cable. Traverse length was monitored using an electronic counter attached to the cable reel, and was recorded on the video tape.

Each video segment was identified on the tape by the beginning and ending manhole IDs of that segment. The date, time, general area, and whether the line was video taped in an upstream or downstream direction were also recorded on the tape. The reference starting and exit points for all lines

was the center of the entrance and exit manhole. As the camera advanced, it was stopped at all pipe joints, connections, and other unusual conditions for accurate observation.
When conditions prevented forward movement of the camera, the camera was withdrawn after documenting the distance. The camera was then setup from the other manhole and the line was video surveyed from the opposite direction to visually inspect as much line as possible.

Documentation of the video inspection includes logs and video tape recordings. Logs were kept to record the location of problem areas. Video inspection logs include manhole IDs, footage, tape number, beginning and ending tape count, a drawing of the sewer lines video surveyed, pipe conditions, sewer connections, and other discernible features. Video playback is at the same speed that it was recorded.

2.3.4. Manhole and Drain Survey

Manholes and surface drains were surveyed to assist in preparing a map of the storm and sanitary sewers within OU-2. Surveying activities located the storm and sanitary sewer manholes, storm sewer outfalls, headwalls, and storm drains. Vertical and horizontal control was to the nearest ± 0.01 feet and ± 0.1 feet, respectively. Horizontal locations were prepared using the Ohio State Plane and Mound Plant's coordinate system. Surveyed locations were compared to drawings provided by Mound Plant to verify their accuracy.

2.4. RESULTS

2.4.1. Field Reconnaissance

Results of the field reconnaissance and manhole inspection for the storm and sanitary sewer systems are presented in Tables II.2 and II.3, respectively. Storm and sanitary manholes that are documented in these tables are shown in Figures 2.3. and 2.4., respectively.

2.4.2. Video Inspection

Of the 5,916 feet of sanitary sewers, and the 14,291 feet of storm sewers that were at least eight inches in diameter, 3,410 feet of sanitary and 8,329 feet of storm sewer lines were video surveyed. The remainder of the lines were not taped because of broken or crushed pipes, horizontal and vertical bends, service connections, and restricted manhole access. Storm and sanitary sewer lines that were inspected are presented on Figures 2.5 and 2.6, respectively. The inspection logs are presented in Appendix A.

Table II.2. Field Reconnaissance Results - Storm Sewers

ID	Description	HNu Reading
MHSS-01-016	No access, inside SW Building, not inspected	NA
SD-01-010	Not inspected	NA
MHSS-01-015	New manhole	0
MHSS-01-017	No access, inside SW Building, not inspected	NA
MHSS-02-003	No access, not inspected	NA
MHSS-02-011	No access, inside E Building, not inspected	NA
MHSS-02-012	Slight erosion under pipe	0.8
SSO-02-101	Location changed, map updated	0
SD-03-015	Storm drain bottom integrity questionable	0
SD-03-014	Water seeping through storm drain wall	0
MHSS-03-025	Location changed, map updated	0
MHSS-03-027	Location changed, map updated	0
SD-04-600	New storm drain	0
SD-04-006	Side of pipe washed away in storm drain	0
SD-04-011	Bottom of storm drain eroded	0
SD-04-012	Storm drain integrity bad	0
SD-04-014	Welded shut, not inspected	NA
SD-04-015	Welded shut, not inspected	NA
SD-04-016	Wrong pipe size specified	0
SD-05-002	Storm drain eroded around pipe	0
SD-05-022	New storm drain	0
SD-05-023	New storm drain	0
SD-05-021	Removed storm drain	NA
SSO-05-102	Removed storm drain	NA
SD-05-020	Storm drain bottom integrity questionable	0
MHSS-06-006	New manhole	0
SD-06-004	Storm drain sides caved in	0
SD-06-007	Subsidence of storm drain	0
SSO-06-101	Location changed, map updated	0
SD-06-010	Storm drain in bad condition, broken sides and bottom	0
MHSS-07-002	New manhole	0
MHSS-07-007	New manhole	0
MHSS-07-001	New manhole	0
MHSS-07-101	Removed manhole	NA
SD-08-004	Storm drain in bad condition	0
SD-08-009	Storm drain bottom eroded	0
MHSS-08-010	Not located during field reconaissance, located during video survey, manhole paved over	NA
HW-08-200	New headwall	0
HW-08-100	Removed headwall	NA
SD-08-016	Storm drain bottom eroded	0
SD-08-018	Storm drain bottom eroded	0
SSO-08-104	Line to storm sewer outfall is not mapped	0
SD-09-012	New storm drain	0
SD-09-004	Gap under inlet pipe	0
SSO-09-100	Location changed, map updated	0
MHSS-10-104	New manhole	0
SD-11-008	New storm drain	0
MHSS-11-026	Manhole bottom condition bad	0
SD-11-027	Seepage into storm drain through wall	0
SSO-11-108	New storm sewer outfall, line is not mapped	0
SSO-11-107	New storm sewer outfall, line is not mapped	0
SD-11-100	Location changed, map updated	0
MHSS-11-012	New manhole	0
MHSS-11-013	New manhole	0
MHSS-11-015	New manhole	0

HNu Readings in parts per million

NA - No Access, Data Not Available

FIELD-RE.WK3/DATA E

Table II.3. Field Reconnaissance Results - Sanitary Sewers

ID	Description	HNu Reading
MHSAN-01-005	No access, inside SW Building, not inspected	NA
MHSAN-02-001	Manhole not inspected	NA
MHSAN-02-003	Not located during field reconnaissance, identified during video survey, manhole covered	NA
MHSAN-02-010	Erosion under pipe in manhole	0
MHSAN-02-011	Not located during field reconnaissance, identified during video survey, manhole covered	NA
MHSAN-02-012	Sewage lift station made of metal, condition unknown	0
MHSAN-02-013	Sewage lift station made of metal, condition unknown	0
MHSAN-03-013	Standing water on bottom, could not determine condition	0
MHSAN-03-015	Under guard shack, could not inspect	NA
MHSAN-04-002	Gap under pipe in manhole	0
MHSAN-04-003	Removed manhole	0
MHSAN-05-002	Elevated HNu reading	8.0
MHSAN-05-004	VCP tile pipes cracked and separted in manhole.	0.2
MHSAN-05-006	Brick manhole with visible cracks, bottom channel cracked	0
MHSAN-05-007	Elevate Hnu	3.4
MHSAN-05-101	New manhole	0
MHSAN-05-102	New manhole	0
MHSAN-06-001	New manhole, one pipe had smoke rolling out of it.	10.2
MHSAN-06-004	New manhole, bottom integrity questionable	0.2
MHSAN-07-001	Inlet identified as lab waste line from R Building	0.2
MHSAN-08-001	No access, inside substation, not inspected	NA
MHSAN-08-003	Gap around line in manhole	0
MHSAN-08-010	No access, inside M Building, not inspected	NA
MHSAN-09-002	Cast iron pipe questionable	0
MHSAN-09-005	5.0 ppm HNu reading in manhole	5.0
MHSAN-09-007	New manhole	0
MHSAN-09-009	New manhole	0
MHSAN-09-010	New manhole	0
MHSAN-09-011	New manhole	0
MHSAN-09-012	New manhole	0
MHSAN-09-013	Removed manhole	NA
MHSAN-10-001	Brick construction, grouted over, bad condition	NA

HNu Readings in parts per million
NA - No Access, Data Not Available
FIELD-RE.WK3/DATA E

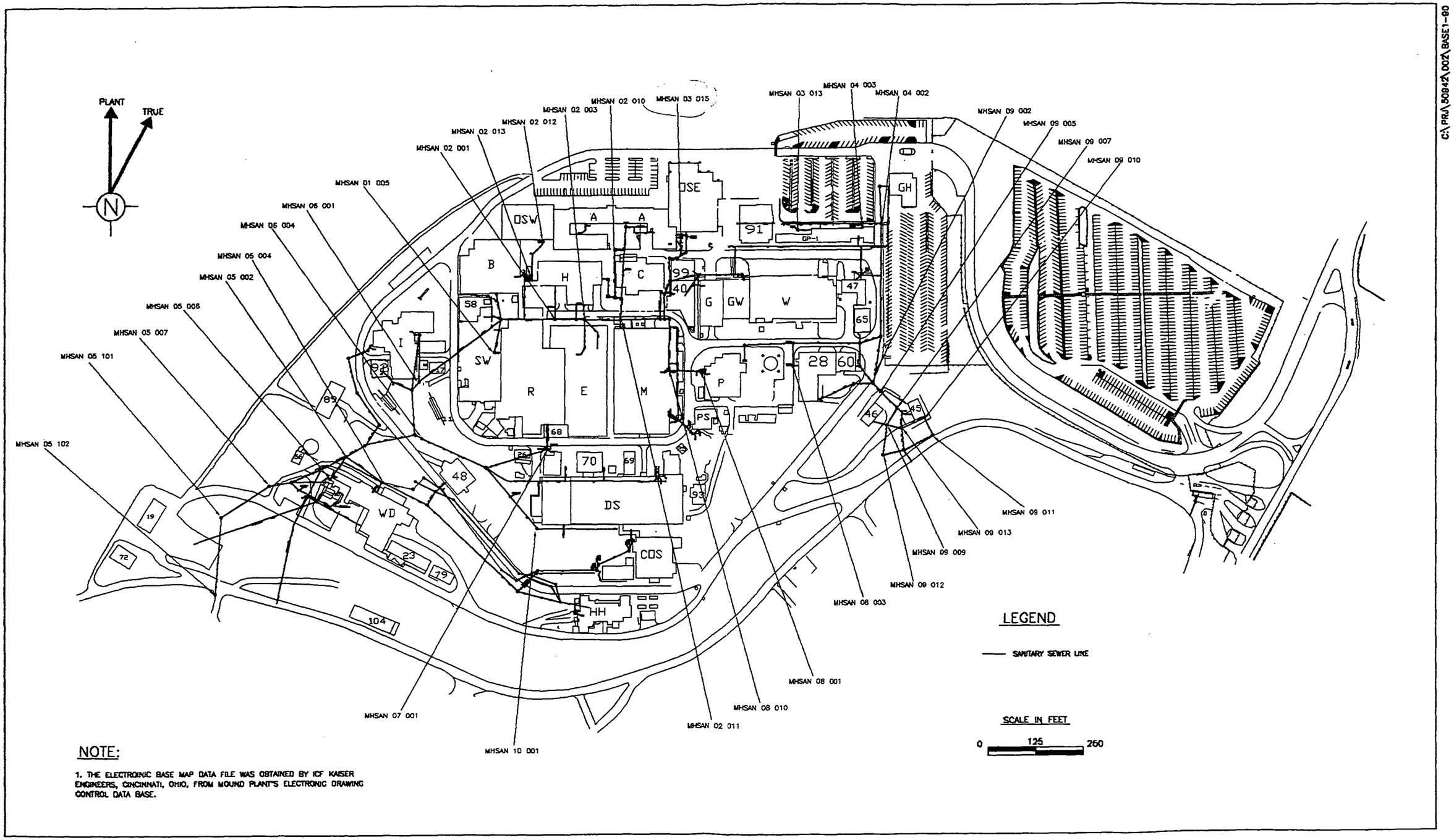

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Figure 2-3. New, Relocated, Removed, or Questionable Integrity Storm Sewer Structures

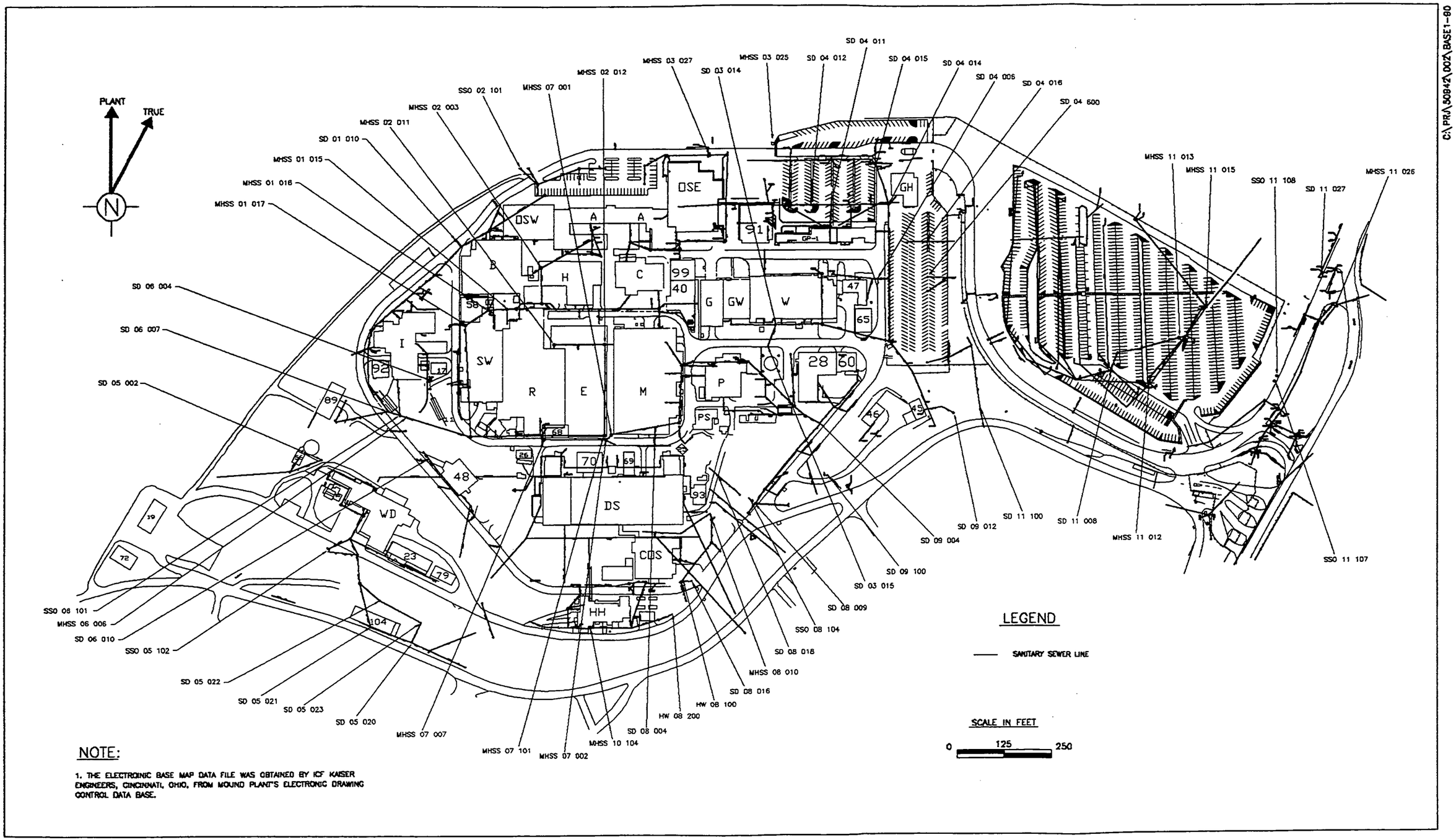

Figure 2.4. New, Relocated, Removed, or Questionable Integrity Sanitary Sewer Manholes

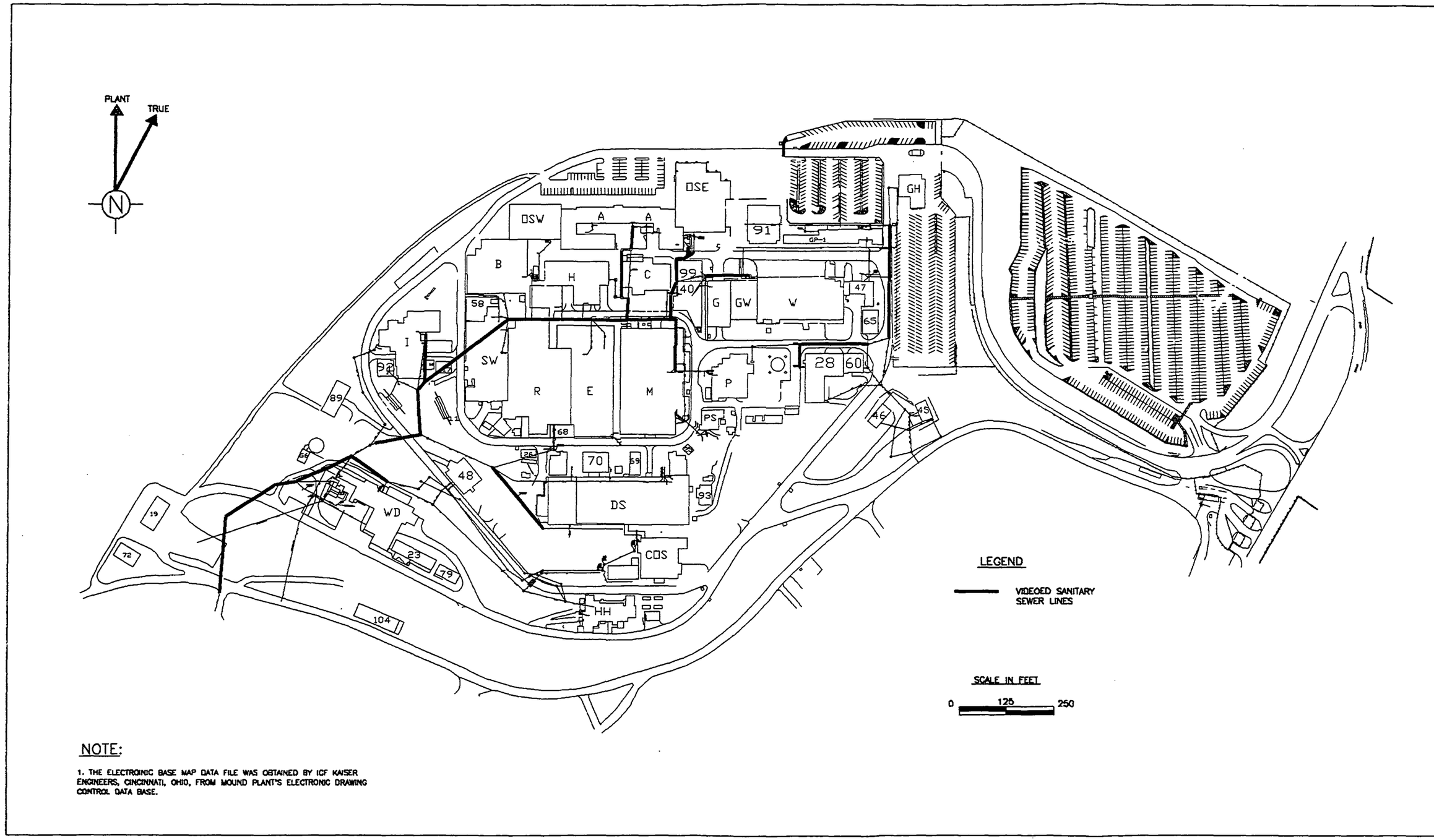

Figure 2.6. OU-2 Sanitary Sewer Lines Video Surveyed

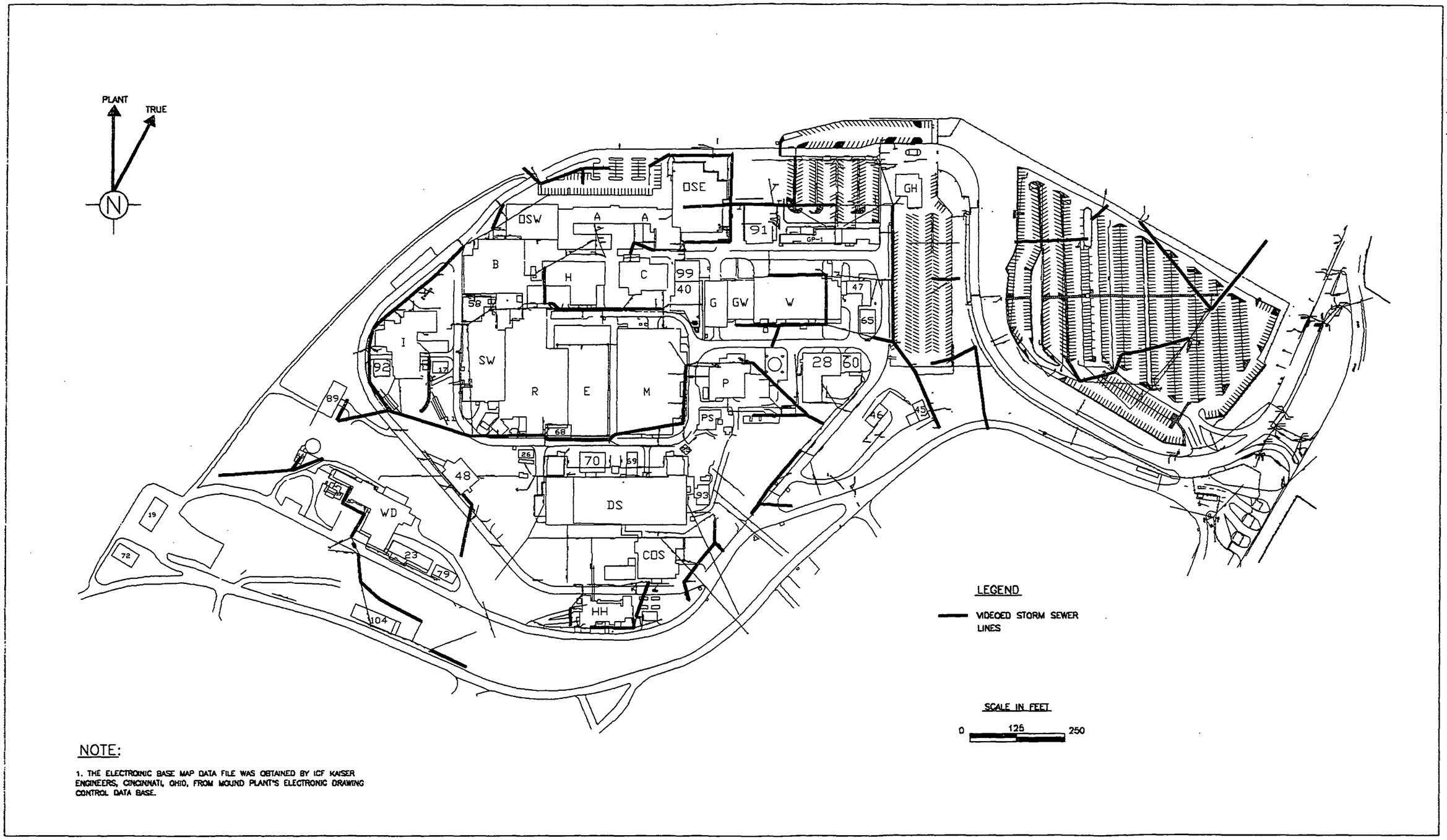

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Figure 2.5. OU-2 Storm Sewer Lines Video Surveyed

Observations of the video inspection are presented on Plates B.1 and B.2 (storm sewers) and Plate B.3 (sanitary sewers). The following conditions were observed during the video inspection and are described below.

- Offset Joint - Offset joints are caused by settlement of either end of the pipe resulting from poor bedding or backfilling during construction. A normal joint appears as an open circle on the TV monitor; offset joint exposes an end of one of the pipe segments.

- Separated Joints - Separated joints occur where two pipes are not butted together properly. Separated joints may be offset.

- Circular Crack - Circular cracks follow the inside circumference of the pipe, are the result of differential settlement, and may precede shear breaks in the pipe.

- Longitudinal Crack - Longitudinal cracks follow the length of the pipe, and may be the result of excessive backfill pressure.

- Surface Cracks - Surface cracks are an inter-woven series of circular and longitudinal cracks and are usually the result of poor pipe construction.

- Possible Leaky Joints - A possible leaky joint may be characterized by scale and mud deposits around a joint. Leaky joints usually occur in conjunction with offset and separated joints.

- Pipe Change - A pipe change occurs when one type of pipe is connected with another type of pipe.

- Crushed Pipe - A crushed pipe occurs when there is excessive pressure on the pipe, which causes the top portion of pipe to collapse.

- Hole in Pipe - Holes occur in the sewer pipes at various locations.

- Missing Piece of Pipe - A missing piece of pipe is a large hole in the line. This occurs when an entire piece of the pipe has broken away from the line.

- Unmapped Service Connections - The video survey identified unmapped service connections and verified the mapped service connections.

- Eroded Pipes - Eroded pipes are noted by the lack of a bottom channel section of pipe. Eroded pipes may be the result of high velocity water flowing through the pipe, an abrasive suspended load in the water, or a corrosive liquid load.

- Belly - A belly is caused by poor compaction of the bedding material and by unstable soil conditions, which results in the settling of the pipe, creating a sag in the line. A belly traps both solids and water in the sag and may cause blockages. Offset and separated joints are common at the beginning and end of a belly. A belly also interferes with video inspection because the camera is usually under water in the sag which inhibits the viewing of the line.

- Roots in Pipe - Roots occur in the sewer lines through cracks, holes and separated and offset joints in the pipe.

2.4.3. Location Survey

The storm and sanitary sewers were located utilizing a vertical and horizontal location survey. The drawings provided by Mound were compared to the survey data and drawings. Surveyed locations were incorporated into the drawings attached in Appendix B to produce an accurate map of the storm and sanitary sewers. The surveying data is presented in Appendix C. Some of the storm and sanitary manholes were not surveyed because of they were located in buildings or restricted areas.

2.5. CONCLUSIONS

The field reconnaissance identified storm and sanitary sewer structures that were new, removed, or not consistent with the drawings provided by Mound Plant. Several storm and sanitary sewer structures had questionable integrity and may have the potential for leakage. The manholes that had questionable integrity may require additional investigation. Locations of the storm and sanitary sewer structures were horizontally and vertically surveyed. Maps were produced from the field reconnaissance and location survey data.

The storm and sanitary sewers were video inspected and a visual record produced. The questionable integrity areas of the storm and sanitary sewers identified during the video survey inspection may have the potential for leakage. Maps showing the locations and types of defects were developed (Appendix B). To identify whether these areas are leaking, additional investigations of the storm and sanitary sewers should be performed. The map of potential leakage areas will be used during RI scoping activities to identify areas for additional investigation. The scope of the additional investigations will be addressed in the OU-2 RI Phase I Reconnaissance Summary Report.

SECTION 3

3. OTHER SUBSURFACE UTILITIES

3.1. OBJECTIVES

This section addresses other subsurface utilities, including pressurized line (fire and domestic water supply), hazardous waste lines, electric, ADT, telephone, and utility trenches. The objectives for the fire and domestic water supply lines are to produce maps showing the locations of the pressurized lines, confirm their locations by field verification, evaluate the integrity of the lines, and produce a map identifying the potential areas of leakage from the pressurized lines.

The objectives for the hazardous waste lines, electric lines, ADT lines, telephone lines, and utility trenches are to produce accurate maps of these utilities and confirm their locations by field verification. These maps wills be used in future RI phases to assist in determining if water has the potential to move laterally along their underground trenches, as well as guiding collection of surface and subsurface samples.

3.2. FIRE AND DOMESTIC WATER LINES

3.2.1. Background

Mound Plant's domestic and fire supply water comes from three wells at the southwest corner of the Mound Plant. Water is treated and pumped to three large surface tanks. Two large water towers, one on the Main Hill by P Building and one on the SM/PP Hill, provide the potable water on-site. These two water tanks hold 100,000 and 250,000 gallons, respectively. These water towers deliver 50% of their capacity for domestic and process uses and the other 50% is retained for fire protection. Additional fire protection is provided by a 350,000-gallon tank located by Building 56. The domestic water supply and fire water supply lines are separate systems, with separate supply lines. Process water used at Mound Plant comes from the domestic water lines. All water supply piping is underground to protect it from freezing. (DOE 1991a)

3.2.2. Collection of Existing Drawings

Fire and domestic water supply line drawings were compiled from the CAD Department at Mound Plant, and were provided in an electronic format. These drawings were used as the base maps for the fire and domestic water supply evaluation. The drawings were reviewed to identify the locations of the fire and domestic water supply lines.

3.2.3. Field Implementation

No field reconnaissance was performed on the fire and domestic water supply lines. Since these systems are underground, verification of their locations by a field reconnaissance was not possible.

Subcontractors were contacted concerning pressure line testing on the fire and domestic water lines at Mound Plant. The subcontractors reported that to accurately locate leaks would require isolating the lines every twenty feet. This would require digging access holes to the fire and domestic water lines, breaking the lines at both ends, performing the test, sealing the breaks in the line, and backfilling the access hole, and repaving the access areas. Due to the high cost, time required, and the damage that would be caused to the pressurized lines, it was decided not to perform this type of testing on the pressurized lines.

3.2.4. Results

Because the lines are buried, the accuracy of the fire and domestic water supply line maps could not be determined by the visual inspection. The drawings provided by Mound Plant are presented in Figure 3.1. and 3.2., respectively.

Mound personnel were interviewed to obtain additional information about the fire water supply system. They reported that Building 56 houses a "jockey" pump which pumps fire supply water from the 350,000 gallon water storage tank to the fire water supply lines. The fire water lines are pressurized at 115 pounds per square inch (psi). When the pressure in the fire water supply lines drops below 75 psi the jockey pump starts to repressurize the fire water supply lines (Heights 1994).

Mound Plant determines a leakage rate from the fire water supply lines by how long the jockey pump runs when the pressure drops below 75 psi. The duration of "pump on" and "pump off" times are noted. A ratio between these two times is determined and then multiplied by the pump's capacity (Bremer 1994). This calculation is shown below:

$$\frac{\text{Run time}}{\text{Cycle time}} \times \text{Pump Capacity} = \text{Leakage rate}$$

For example:

$$\frac{\text{1.5 minutes}}{\text{10 minutes}} \times \text{30 gpm} = \text{4.5 gpm}$$

It was reported that the standard leakage rate for Mound Plant's fire water supply system is 4.5 gallons per minute (gpm). This leakage rate calculated over a one year period would amount to 2.3 million

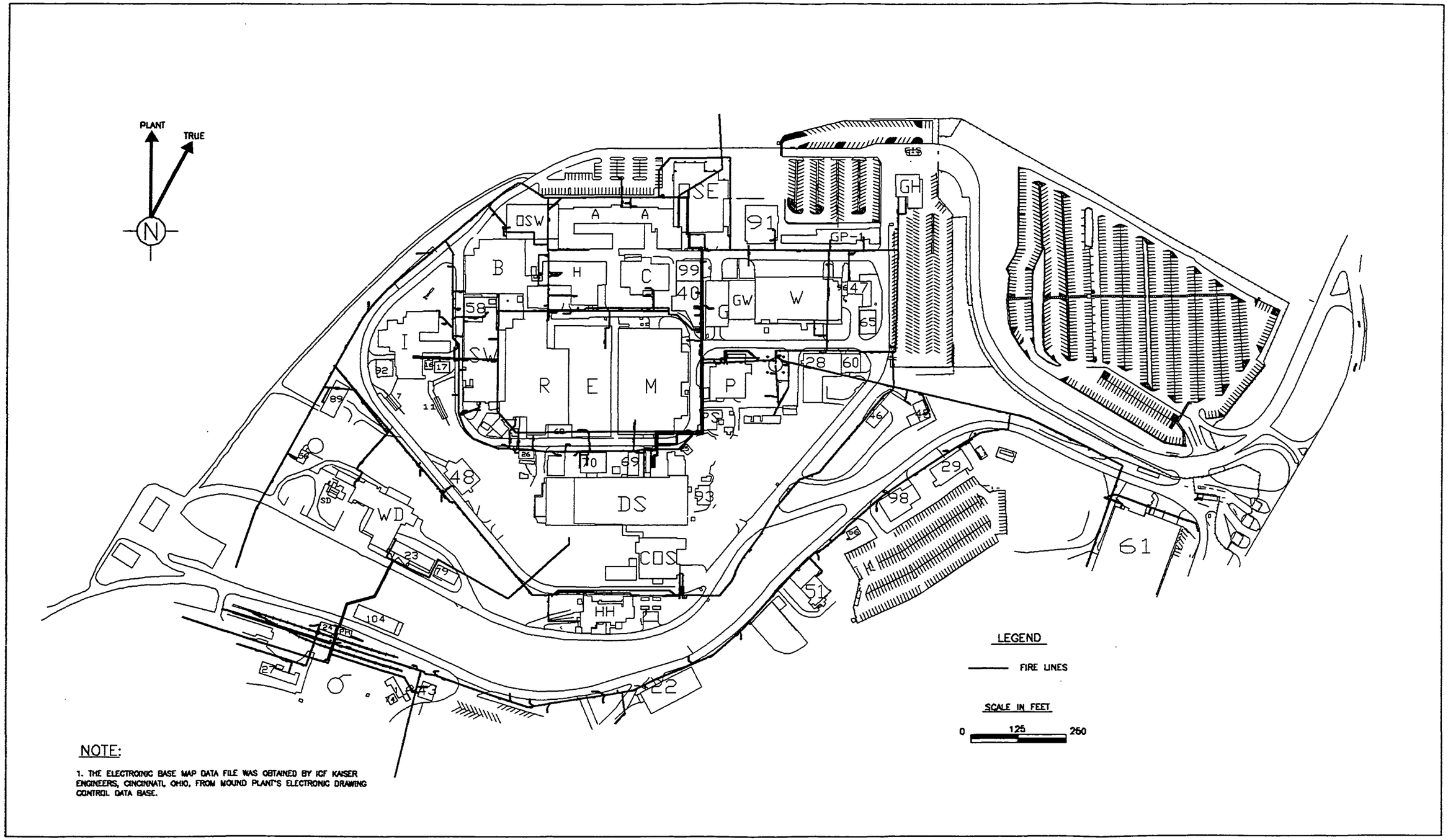

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Figure 3.1. OU-2 Fire Water Supply Lines

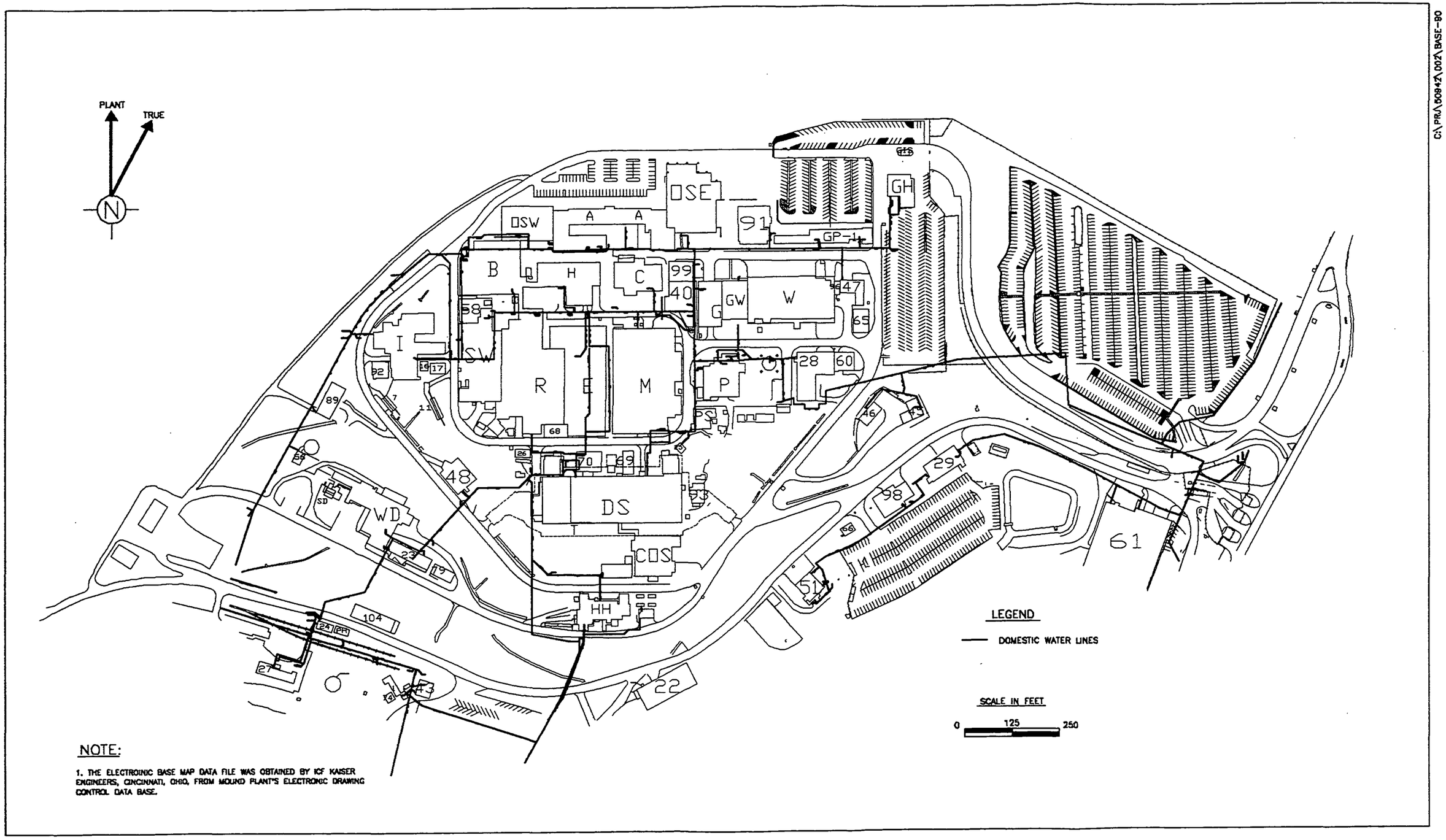

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Figure 3.2. OU-2 Domestic Water Supply Lines

gallons of water that are lost from the fire water supply lines. When this rate is calculated to be higher than 4.5 gpm it indicates additional leakage, and may indicate that there is a break in the fire water supply lines somewhere at Mound Plant.

Fire water lines were originally constructed of cast iron pipe (CIP), but the majority of the lines have been replaced with trancite (an asbestos cement pipe that is characterized by its brittleness). The trancite fire water supply loop for T Building and COS Building was abandoned and replaced with ductile iron pipe. Bedding and backfill materials for the fire water supply lines are pea gravel. It was previously reported that the majority of the leaks are the result of improper backfill methods (Bremer 1994).

Line breaks occurred at several locations within OU-2 in 1994. On April 18, a domestic water line broke underneath SW Building. Also during the summer of 1994 repair work began to seal the basement walls on A Building. When the excavation along the north face of the building was initiated, a leaking fire water line was exposed. The line was shut off and repaired. When this repair was completed the flow rate at a near by seep slowed indicating that the leaking fire line had been contributing directly to the groundwater within OU-2 (DOE 1994). Another area where leakage from a fire line was confirmed was along the south side of HH Building. The line, which runs under sections of the HH Building floor, is currently shut off and by-passed with a flexible fire hose at the ground surface along the south side of the building.

No documentation on the weekly jockey pump tests is kept. As a result, an accurate estimate of the amount of water that is released yearly cannot be determined. In addition, the normal leakage rate occurs over the entire Mound Plant. The amount of water that is contributed to the subsurface within the boundaries of OU-2 is unknown.

3.3. HAZARDOUS WASTE LINES

3.3.1. Background

Some liquid radioactive wastes at Mound Plant were originally transmitted from research and process areas on the Main Hill to the WD Building and the WD Building Annex through underground waste lines. These lines were divided into two systems; one to carry alpha wastewater and the other to carry beta wastewater, primarily tritium contaminated wastewater. These lines are constructed of either CIP, polyvinyl chloride (PVC), or VCP. When it became apparent that these underground lines were susceptible to breaks and leaks, the wastes were transmitted through other means. Above-ground double encased lines are now used along with a tanker truck to move radioactively contaminated liquid wastes to the WD Building and WD Building Annex; however, certain underground lines have not been completely

abandoned. The WD Building continues to process liquids from some underground lines; these liquids are suspected of coming from infiltration of the groundwater and possibly small quantities of uncontaminated process aqueous wastes from cross connections (DOE 1992a).

3.3.2. Collection of Existing Drawings

Hazardous waste line drawings were compiled from the CAD Department at Mound Plant, and were provided in an electronic format. These drawings were used as the base maps for the hazardous waste line evaluation. The drawings were reviewed to identify the locations of the hazardous waste lines.

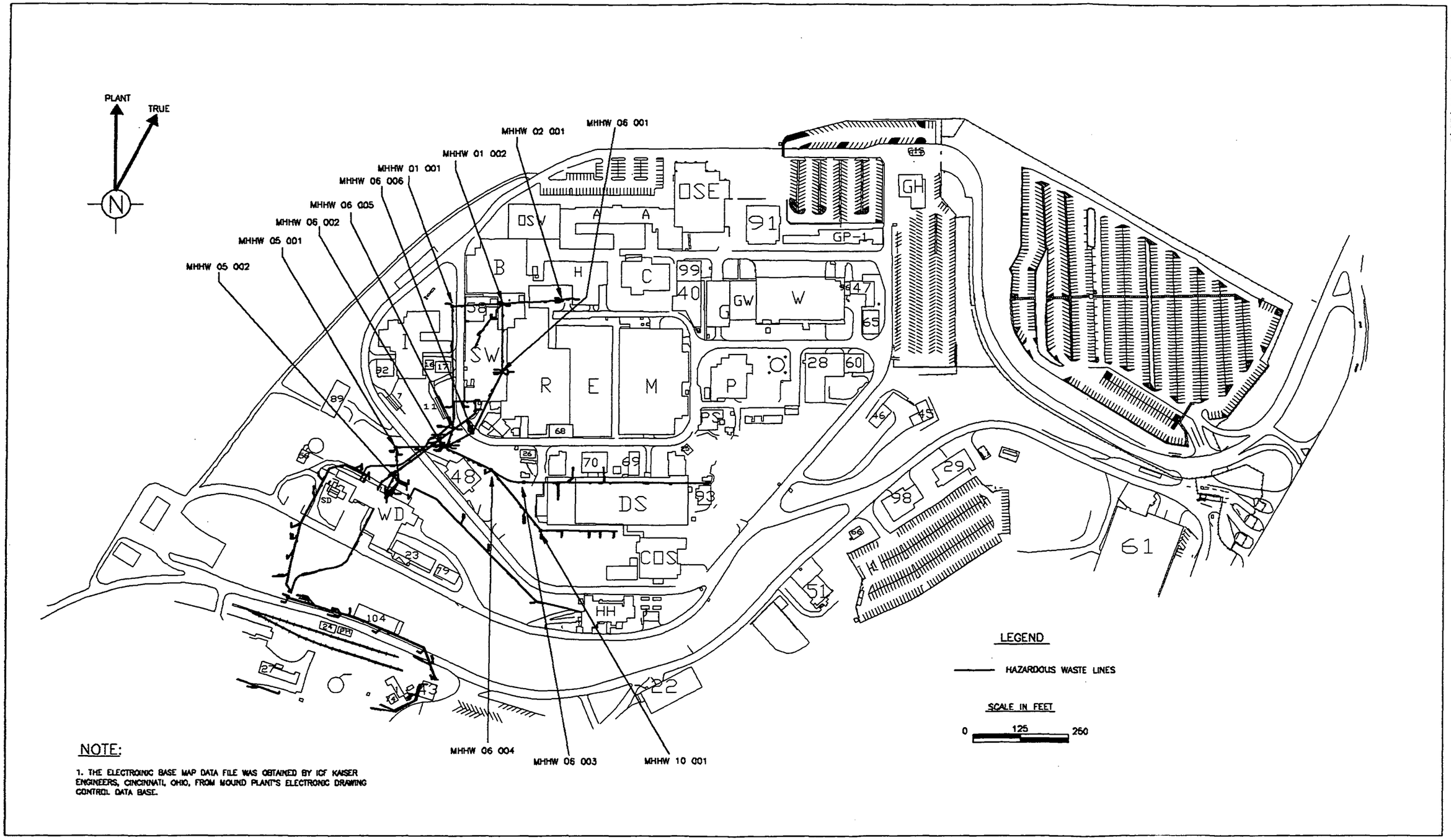
3.3.3. Field Implementation

A field reconnaissance was performed on the hazardous waste lines to verify the locations of the manholes and determine the accuracy of the drawings provided by Mound Plant. The locations of the hazardous waste manholes found in the field were compared with those on the drawings.

The hazardous waste manholes on the utility drawing were assigned a unique identifier (MHHW-BB-CCC) as described in Section 2.3.2. New and relocated manholes were documented on the utility drawing and were assigned an identifier. After assigning each manhole an identifier, and prior to opening any manhole, a portable Organic Vapor Analyzer (HNu PID Model 101) was used to screen each manhole. When possible, utilities were screened by inserting a probe through the manhole cover and recording the reading. When the manhole cover did not have any holes, the screening was performed by opening the cover enough to insert the probe beneath the cover. Additionally, the hazardous waste manholes were screened for radioactive sources by Mound Health Physics Personnel after opening each manhole cover.

After the cover was removed the number of pipes entering and exiting the manhole was compared to the utility drawings and any differences were documented. The estimated size of each pipe and the pipe type were compared to the utility drawings. Any deviations were noted on the drawings and in the field logbook.

Access to some Mound Plant areas was restricted. No investigation was performed on manholes located in restricted areas, including inside buildings, construction areas, and D&D areas.



NOTE:

1. THE ELECTRONIC BASE MAP DATA FILE WAS OBTAINED BY ICF KAISER ENGINEERS, CINCINNATI, OHIO, FROM MOUND PLANT'S ELECTRONIC DRAWING CONTROL DATA BASE.

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Figure 3.3. Hazardous Waste Lines

3.3.4. Results

The field reconnaissance did not identify new, relocated, or removed hazardous waste line structures. Locations of hazardous waste line manholes are presented in Figure 3.3. Locations of these lines are being surveyed under OU-6.

3.4. ELECTRIC, ADT AND TELEPHONE LINES

3.4.1. Collection of Existing Drawings

Electric, ADT, and telephone line drawings were compiled from the CAD Department at Mound Plant and provided in an electronic format. These drawings were used as the base maps for the electric, ADT, and telephone line evaluation. The drawings were reviewed to identify the locations of these lines.

3.4.2. Field Implementation

Field reconnaissance was performed in an attempt to verify the accuracy of the electric, ADT, and telephone line drawings. The field reconnaissance located the telephone and electric line manholes. Each manhole was screened using a portable Organic Vapor Analyzer (HNu PID Model 101). When possible, manholes were screened by inserting a probe through holes in the cover. When the manhole cover did not have any holes, the screening was performed by opening the cover enough to insert the probe beneath the cover. After the covers were removed the number of lines entering and exiting a manhole was noted.

3.4.3. Results

An attempt was made verify the accuracy of the phone, electric, and ADT utility drawings; due to the layout of the three systems, field verification was not possible. The three systems are not divided into separate and distinct underground utilities. Generally, the telephone and electric lines have separate and unique manholes; however, at various locations, telephone lines were observed in "electric" manholes, and vice versa. At most, but not all locations, the ADT lines ran in sequence with the electrical lines. Drawings provided by Mound Plant for electric, ADT, and telephone lines are presented in Figure 3.4, 3.5 and 3.6, respectively.

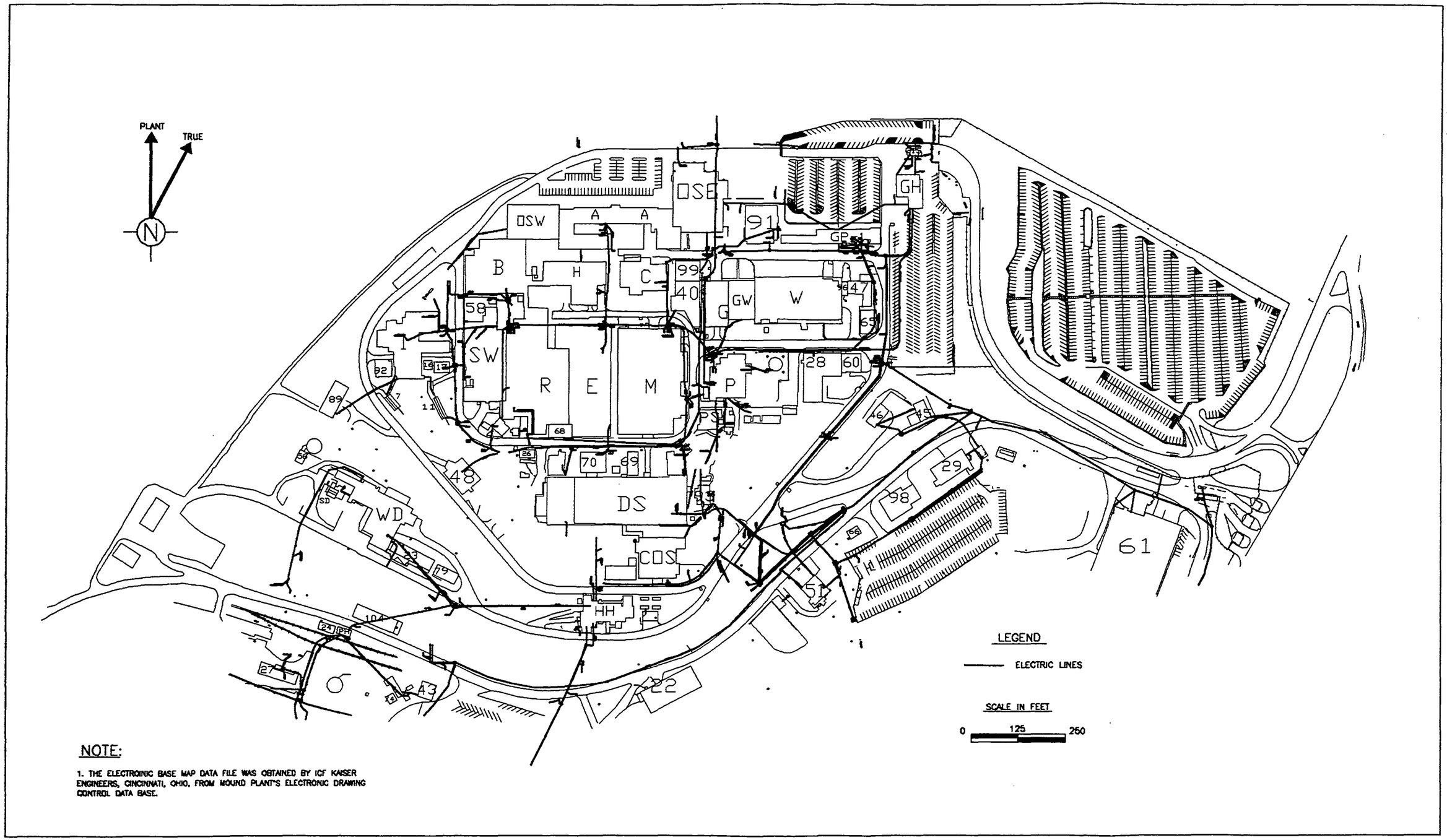

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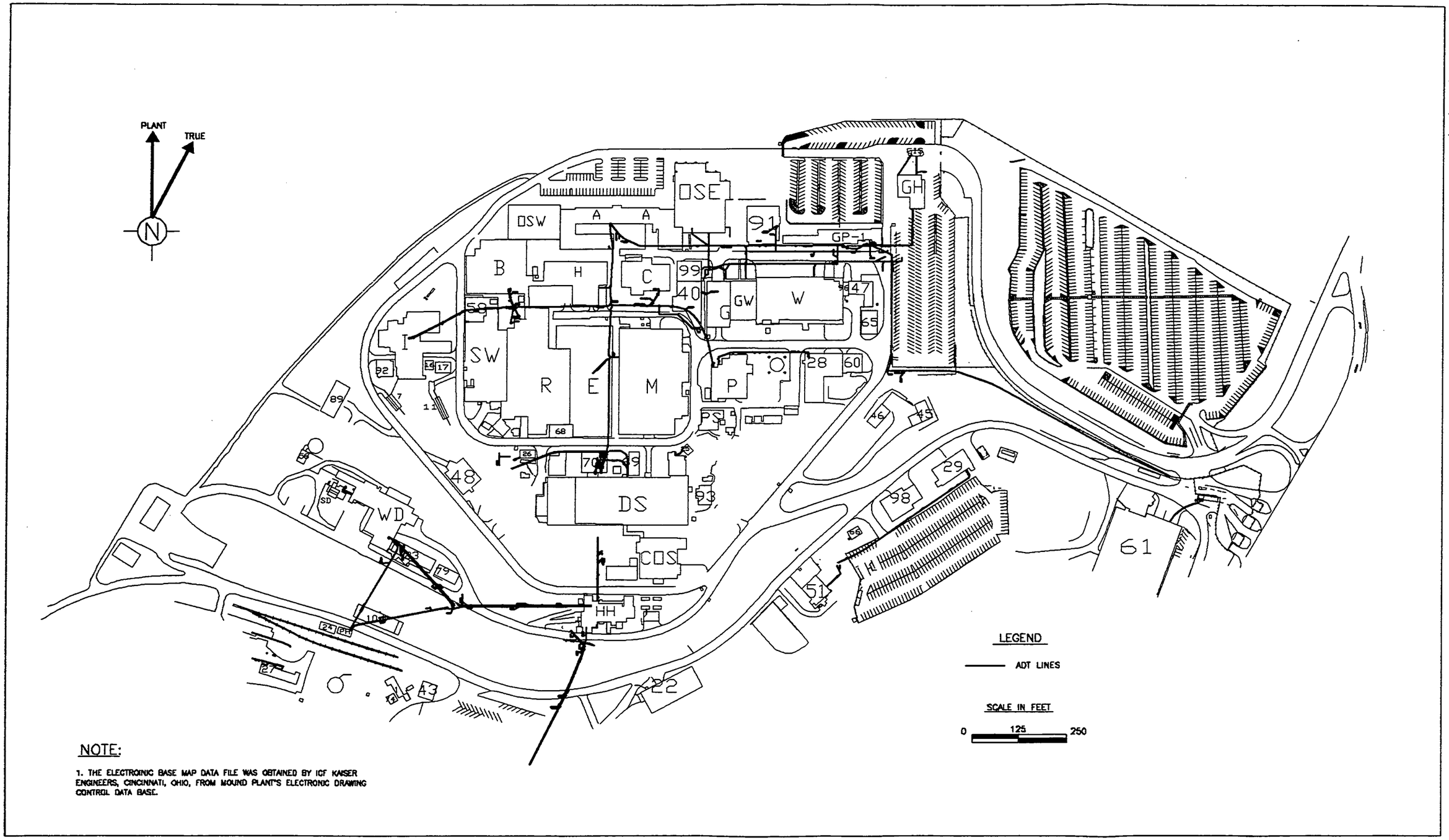
Figure 3.4. OU-2 Electric Lines



NOTE:

1. THE ELECTRONIC BASE MAP DATA FILE WAS OBTAINED BY ICF KAISER ENGINEERS, CINCINNATI, OHIO, FROM MOUND PLANT'S ELECTRONIC DRAWING CONTROL DATA BASE.

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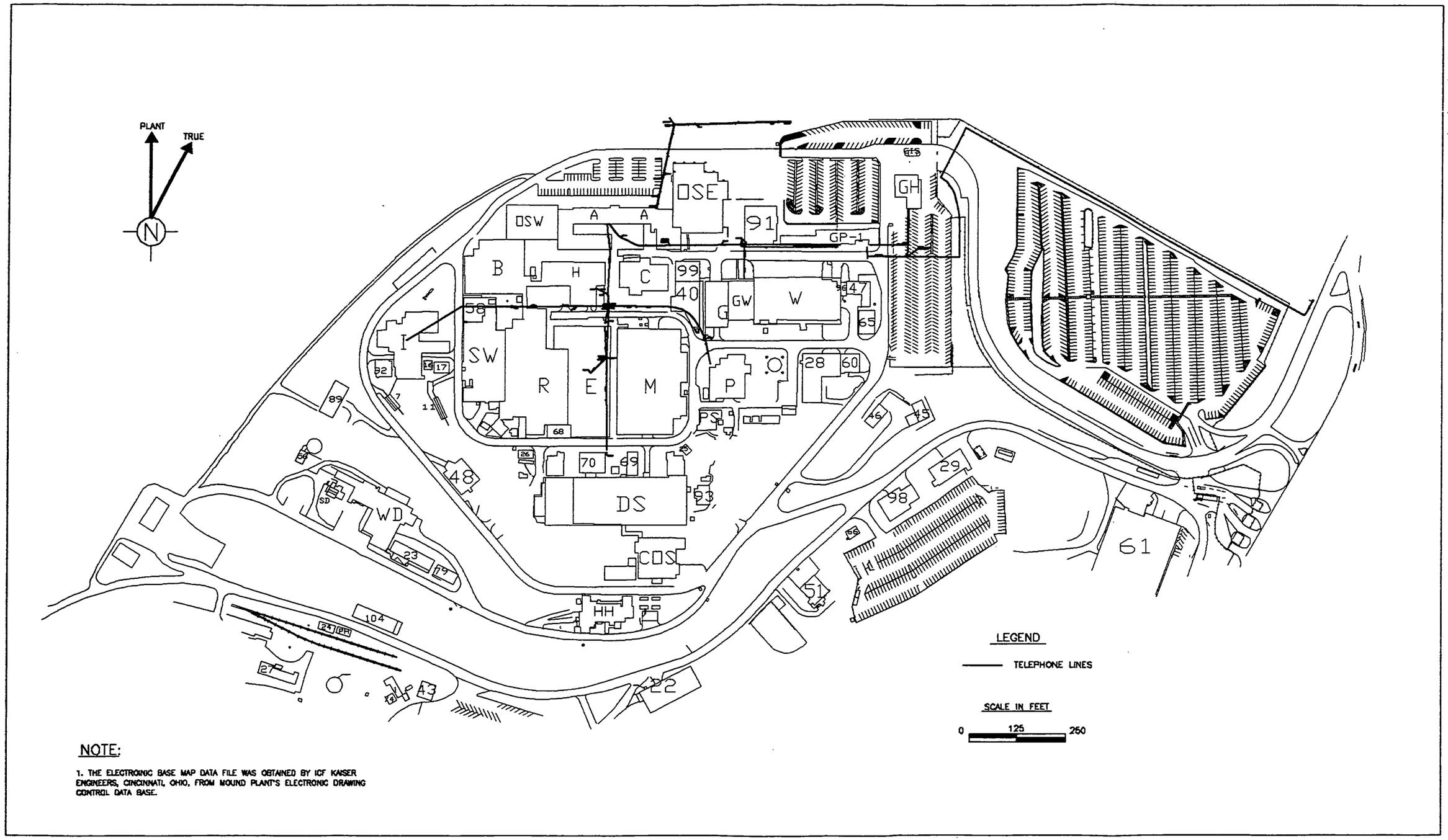
Figure 3.5. OU-2 ADT lines



NOTE:

1. THE ELECTRONIC BASE MAP DATA FILE WAS OBTAINED BY ICF KAISER ENGINEERS, CINCINNATI, OHIO, FROM MOUND PLANT'S ELECTRONIC DRAWING CONTROL DATA BASE.

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Figure 3.6. OU-2 Telephone Lines

3.5. UTILITY TRENCHES

3.5.1. Collection of Existing Drawings

Utility trench drawings were obtained from the CAD Department at Mound Plant in an electronic format. These drawings were used as the base maps for the utility trench evaluation. Drawings were reviewed to identify the utility trench locations.

3.5.2. Field Implementation

Site reconnaissance was performed to verify the locations of the utility trenches identified in the drawing review. Trenches were to be verified by identifying the beginning and ending points of the trench by visual inspection. Trenches that were field identified were not inspected internally.

3.5.3. Results

Drawing review identified six underground utility trenches located by Buildings OSW, A, P, PS, 26 and R. These six trenches are identified in Figure 3.7. Available information on the six utility trenches is presented in Table III.1.

Site reconnaissance verified the locations of two utility trenches (1 and 2). Utility trench 1 connects the south side of OSW to the west side of OSW. Utility trench 2 has a walkway on top of the trench that is covered by concrete slabs with water stops between the slabs. This utility trench connects A Building with M Building, and has several laterals that connect to C, H, and M Buildings. The other four utility trenches could not be verified by field reconnaissance. This is due to lack of access to buildings where the trenches begin or end. Trenches that were field identified were reported to contain pressurized lines and water lines. The other trenches were reported to transport air and contain electric lines.

3.6. CONCLUSIONS

3.6.1. Fire and Domestic Water Supply Lines

The accuracy of the fire and domestic water supply lines could not be determined by field reconnaissance. Pressure testing was not conducted on the fire and domestic water supply lines because qualified subcontractors reported that the lines would have to be broken at twenty foot intervals to accurately locate leaks. Due to high cost, time required, and damage that would be caused to the lines, this testing was not conducted.

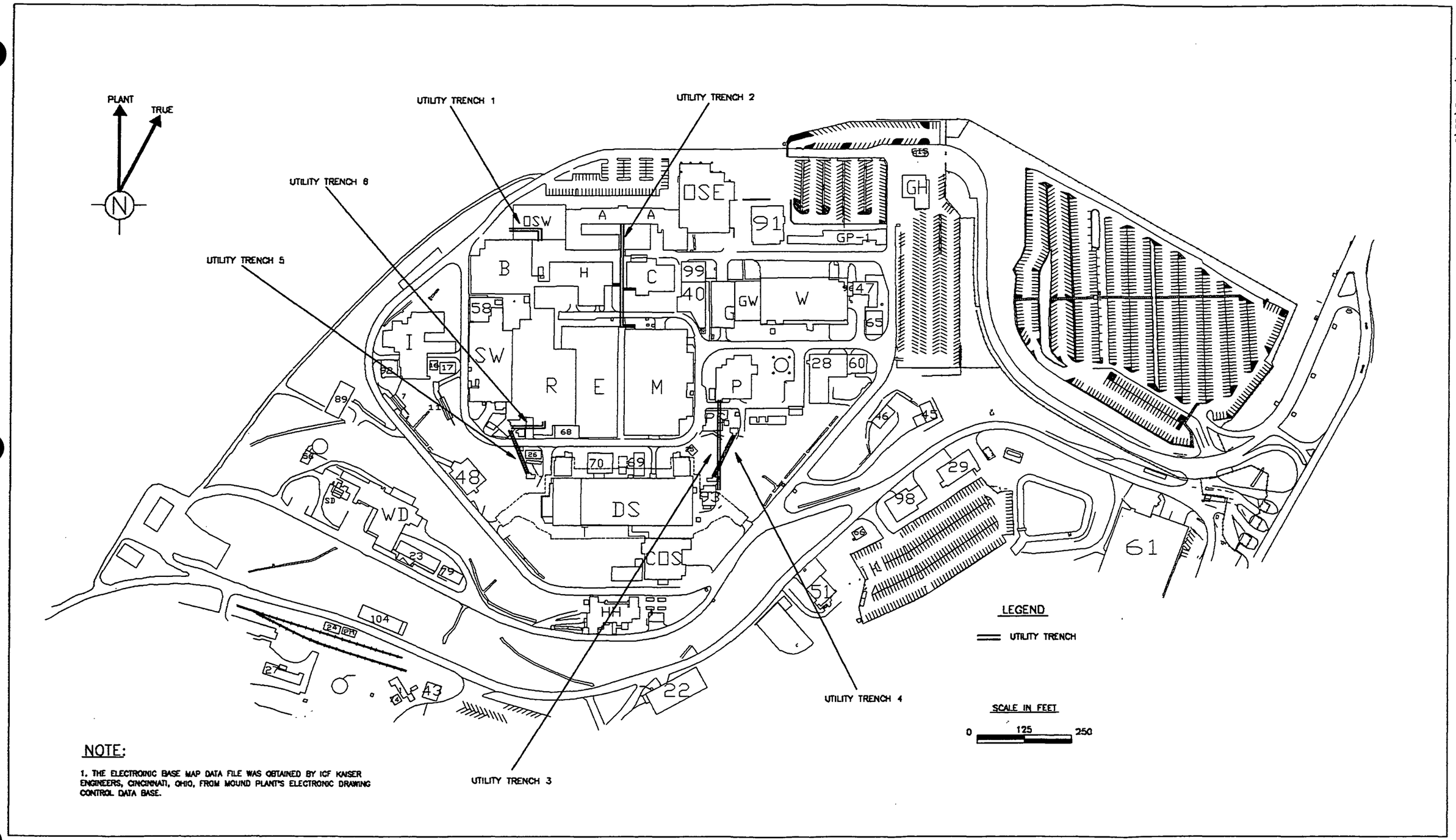

Figure 3.7. OU-2 Utility Trench Locations

Table III.1. Utility Trench Information

No	Begin	End	Size	Purpose	Inspected	Contains
1	South side OSW	West side OSW	--	Pipe trench under floor in OSW	Yes	4" CIP Domestic Water
2	A Bldg.	M Bldg. laterals to: C Bldg. H Bldg.	5 ft Dia	Pipe trench	Yes	4" Brine Supply 4" Brine Return 2" Compressed Air 3" Condensate Line 6" Steam Line
3	P Bldg.	T Bldg	--	Electric	No	16, 4" Dia. conduit
4	Blower Unit by PS	Shed by Bldg 93	5 ft Dia	Air Tunnel	No	NA
5	Blower Unit by R Bldg.	Shed West of DS Bldg. South of Bldg. 26	6 ft Dia	Air Tunnel	No	NA
6	Blower Unit by R Bldg.	R Bldg.	5 ft Dia	Air Duct	No	NA

NA = Not Applicable
-- = No Information Available
Dia = Diameter
Bldg. = Building
CIP = Cast Iron Pipe

Mound Plant personnel reported that the fire water supply lines leak at a normal rate of approximately 4.5 gpm over the entire Mound Plant. This amounts to 6,480 gallons per day (gpd) or 2.3 million gallons per year. The water leakage rate within the geographical boundaries of OU-2 is unknown. Several fire water supply lines have broken in 1994, resulting in higher leakage rates. Additional investigation of the fire lines is necessary to estimate the quantity of water that is being lost through leakage.

3.6.2. Hazardous Waste Lines

Field reconnaissance did not identify any new, relocated, or removed hazardous waste line structures. The hazardous waste lines will be evaluated, in future phases, to determine if liquids have the potential to migrate in the underground trenches associated with these lines.

3.6.3. Electric, ADT, and Telephone Lines

An attempt was made to verify the accuracy of the phone, electric, and ADT utility drawings; due to the layout of the three systems, field verification was not possible. The electric, ADT, and telephone lines will be evaluated, in future phases, to determine if liquids have the potential to migrate in the underground trenches associated with these lines.

3.6.4. Utility Trenches

Six underground utility trenches were identified during the drawing review. They are located by Buildings OSW, A, P, PS, 26 and R. Site reconnaissance verified the locations of two utility trenches. The other four utility trenches could not be verified by field reconnaissance. Utility trenches will be evaluated, in future phases, to determine the affect of these trenches on the migration of fluids in the subsurface.

SECTION 4

4. SURFACE DRAINAGE

4.1. OBJECTIVES

The objectives of this subtask were to produce an accurate map of the OU-2 surface water drainage and determine the areas of potential infiltration to the groundwater from the surface water drainage system. These areas will be investigated in future RI phases to evaluate if infiltration is a migration route to the subsurface.

4.2. BACKGROUND

Mound Plant can be divided into five watersheds as presented in Figure 4.1. The approximate areas for these watersheds are shown below.

Subwatershed	Area (Acres)
1	99
2	33
3	142
4	18
5	14
Total	306

OU-2 falls geographically within Subwatersheds 1,4, and 5 (Figure 4.1). Subwatershed 5 largely collects water from the parking lot and roads along the Main Hill entrance. The water from Subwatershed 5 is routed to the north. The central portion of the Main Hill primarily falls within Subwatershed 4. Subwatershed 4 drains to the west where most of the water is routed to National Pollutant Discharge Elimination System (NPDES) Outfall 001. Some runoff from Subwatershed 4 is believed to flow down the northwest side of Main Hill along a steep hillside where it ponds at the base of the hill. Subwatershed 1 drains the southern and eastern portion of Main Hill. (DOE 1991b)

Within subwatershed 1, the drainage patterns have been modified by plant development, although the plant drainage ditch approximately follows its original course as it flows between Main Hill and Special Metallurgical/Plutonium Processing (SM/PP) Hill. Overland flow from the hill slopes is collected by roads or locally lined open ditches and culverts. Continued development at Mound Plant has increased the storm water runoff in subwatershed 1, following a typical sequence that occurs when vegetated lands have been converted to industrial use. Impervious pavements and roof areas replaced grasslands that had allowed infiltration of rainfall. The additional runoff has overloaded the capacity of the original storm system and created minor flooding in several areas (MRC 1985).

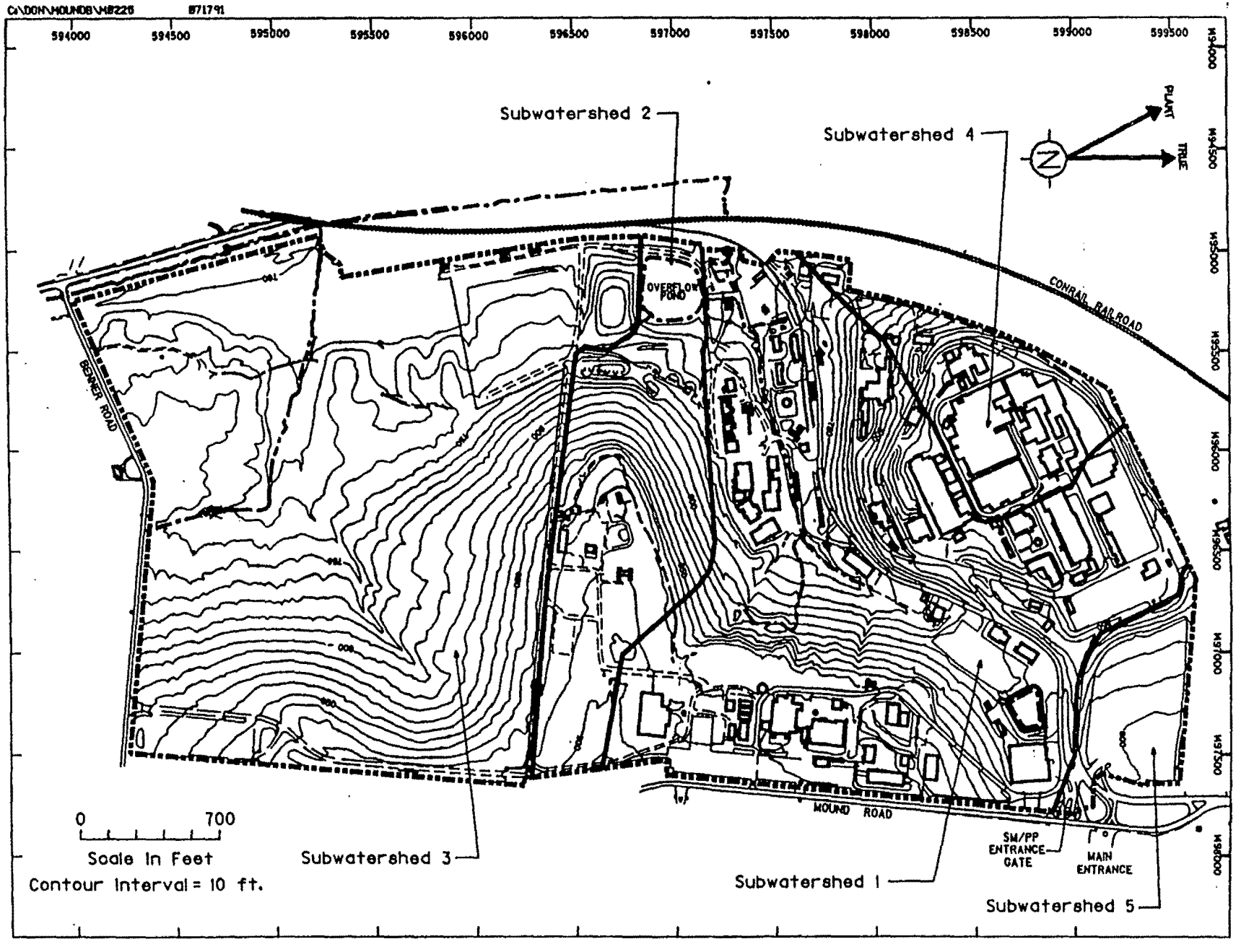

Figure 4.1 Mound Plant Subwatersheds

4.3. SUMMARY OF ACTIVITIES

Surface drainage reconnaissance survey consisted of a map and drawing review, and several site investigations. These activities are further discussed in the following sections.

4.3.1. Review of Existing of Drawings

Surface drainage drawings were compiled from the CAD Department at Mound Plant and provided in electronic format for the surface drainage and topography. The drawings provided were used as the base maps for the surface drainage investigation. A drawing review was conducted to identify the surface drainage structures in OU-2. The field reconnaissance would confirm the accuracy of the drawing.

4.3.2. Field Implementation

The reconnaissance survey was performed on all lined and unlined surface drainage structures to determine areas of potential infiltration to the subsurface. An objective of the field reconnaissance was to identify the drainage structures that allowed water to pond. To determine this, the field reconnaissance was performed during a wet period to identify the drainage areas that allowed water to pond and then again during a dry period to determine which ponded areas remained. This determined which drainage areas had the potential to allow water to infiltrate to the subsurface.

The surface drainage field reconnaissance was conducted at Mound Plant on April, 26, 27, 28, June 1, and July 26, 1994. During these periods, daily precipitation amounts were recorded from the Mound Plant rain gauge located on the Main Hill. The gauge is automatic and records precipitation readings (in inches) at midnight for the previous 24 hours.

Days that the surface drainage structures were inspected and their associated precipitation are presented below. Mound Plant precipitation data is attached in Appendix D.

Date	Field Reconnaissance	Rainfall (inches)
April 25, 1994	No	0
April 26, 1994	Yes	0
April 27, 1994	Yes	0.11
April 28, 1994	Yes	0.43
May 31, 1994	No	0
June 1, 1994	Yes	0
July 25, 1994	No	0
July 26, 1994	Yes	0

In addition, drainage areas that remained saturated were identified by visual inspection (e.g., cattail growth) during the field reconnaissance. Also identified were drainage areas that had buildup of sediment. Excess sediment was interpreted to have resulted from ponding and possible infiltration to the subsurface leaving the sediment in the drainage area.

Field reconnaissance verified the accuracy of the surface water drainage drawing provided by Mound Plant. During the field reconnaissance the drawings were compared with the drainage structures located in the field. Each lined and unlined surface drainage structure was assigned a unique ID (LSD or USD - BB-CCC). The field crew identified and mapped all surface water drainage structures that were not on the drawing, corrected errors on the drawing, and verified the surface drainage structures on the drawing.

As part of the Main Hill Seep Investigation, a reconnaissance was performed on the hillsides for unidentified outfalls. No new outfalls were identified during this investigation.

4.4. RESULTS

4.4.1. Review of Existing Drawings

Drawing review located all man made and natural drainage pathways in OU-2. This was accomplished by locating all mapped drainage structures, storm sewer outfalls and associated drainage pathways, natural draws in the topographic contours, storm sewer headwalls, retention/detention ponds, and areas that did not have drainage structures. These areas became the basis for the field reconnaissance of the lined and unlined surface drainage structures.

4.4.2. Field Implementation

Field reconnaissance verified the accuracy of the surface water drainage map provided by Mound Plant. The surface water drainage map was updated to incorporate new and relocated surface water drainage structures. Storm sewer outfalls and head walls were surveyed during horizontal and vertical location surveying activities. These surveyed locations were utilized in producing an updated surface water drainage map. This updated map is presented in Appendix E.

Field reconnaissance identified 18 potential infiltration areas to the subsurface. These areas are discussed in Table IV.1. and identified on the surface water drainage map in Appendix E.

Table IV.1. Potential Areas of Infiltration and Leakage

No.	Drainage ID	Date Inspected	Description
1	USD-08-024	April 27, 1994	Sediment and debris collecting
2	USD-08-025	April 27, 1994	Small sinkhole in unlined surface drainage
3	USD-09-022	April 27, 11994	Standing water
4	USD-09-028	April 27, 1994	Standing water
5	USD-08-024	April 27, 1994	Standing water
6	USD-08-024	April 27, 1994	Saturated soil in surface drainage
7	LSD-05-017	April 26, 1994	Sediment and debris collecting
8	USD-08-024	April 27, 1994	Standing water
9	USD-05-027	April 28, 1994	Standing water
10	LSD-05-026	April 28, 1994	Standing water
11	LSD-10-100	July 26, 1994	Sediment and debris collecting
12	LSD-05-016	April 26, 1994	Cracked and broken concrete in lined surface drainage
13	USD-11-021	April 27, 1994	Standing water, drain is plugged
14	LSD-06-004	July 26, 1994	Cracked and broken concrete in lined surface drainage
15	LSD-05-100	July 26, 1994	Hole under inlet, water runs under lined surface drainage
16	LSD-10-013	April 26, 1994	Standing water and cattails in surface drainage
17	USD-08-025	April 27, 1994	Cracked and broken concrete in lined surface drainage
18	LSD-11-019	April 27, 1994	Sediment and debris collecting

4.5. CONCLUSIONS

Further investigations of the potential areas of infiltration should be conducted to determine if these areas act as a migration route to the subsurface. Additional investigations may require soil sampling, soil vapor analysis, and dye tracing of the surface water to the subsurface. The additional investigations will be addressed in the OU-2 Phase I Reconnaissance Summary Report.

SECTION 5

5. SUMPS AND TANKS

5.1. OBJECTIVE

The objectives of this subtask were to evaluate the integrity of the active underground sumps and tanks and aboveground tanks within OU-2 and assess their potential to contribute to the subsurface. In addition, the sumps and tanks that have been removed from service within OU-2 were to be assessed to evaluate whether the closure activities and verification sampling performed meet the DQOs established in the OU-2 RI/FS WP.

5.2. BACKGROUND

Three investigations have previously been performed in association with Mound Plant's USTs. The first investigation's results were presented in the " Mound Plant Underground Storage Tank Management Plan and Preliminary Cost Estimate" (NUS 1989). This report documents 54 USTs at Mound Plant.

The ER program initiated an evaluation of Mound Plant's USTs as potential release sites under OU-8. This report utilized the report mentioned above, as well as "Project Specifications for Underground Tank Program" (EG&G 1990a), "Response to Review Comments on the Mound Application to Ship Waste to the Nevada Test Site, Issue 12" (EG&G 1990b), and "Limited Field Investigation Work Plan, Mound Plant, Miscellaneous Sites, Operable Unit 3" (DOE 1991b). The purpose of this inventory was to list and describe the known USTs at Mound Plant and categorize each tank based on usage and primary governing regulations. This OU-8 inventory resulted in the identification of 52 additional USTs for a total of 106 USTs at Mound Plant. This investigation identified 29 active radionuclide bearing wastewater tanks and 36 active tanks that contain petroleum products, sanitary wastewater, or metal plating rinse water. In addition, 27 inactive tanks and 14 former tank sites were documented. The results of this investigation were presented in the document, "Mound Plant Underground Storage Tank Program Plan and Regulatory Review" (DOE 1992c).

The third investigation presented in the document, "Active Underground Storage Tank Plan" (Dames & Moore 1994) defined the environmental regulatory program that is applicable for each tank and assigned each Active Underground Storage Tank (AUST) to either the ER program, the D&D program, or the Active Underground Storage Tank Program (AUSTP). This investigation identified an additional 16 AUSTs which brought the number of sumps and tanks at Mound Plant to 122.

5.3. ACTIVE SUMPS AND TANKS

5.3.1. Summary of Activities

5.3.1.1. Review of Existing Information

Previous investigations were reviewed to create a database of the OU-2 sumps and tanks. These sumps and tanks were the basis for the OU-2 sump and tank investigation. After the OU-2 database was compiled, the active sumps and tanks within the geographical boundaries of OU-2 were identified.

5.3.1.2. Field Implementation

Where possible a visual inspection was performed on the active sumps and tanks within OU-2. This visual inspection verified the Dames & Moore (1994) findings and added additional inspection criteria. Dames & Moore documented the tank material, cathodic protection, tank inlet and outlet, spill overflow protection, piping material, substance stored, tank site description, tank and piping release detection methods, purpose, and the history of spills. The OU-2 investigation included tank condition, secondary containment condition, migration pathways, visible signs of release, and field rated each tank for either a high, medium, or low possibility of release. This visual inspection was performed on June 14, June 15, and July 7, 1994.

5.3.1.3. Sump and Tank Evaluation

In order to evaluate which, if any, active sumps and tanks warrant additional investigation, a ranking system was developed based on the information that existed for each sump and tank. Each active sump and tank was ranked in 5 different categories based on EPA requirements for new underground storage tanks (40 CFR Parts 280 and 281). The ranking categories included the tank material type, tank cathodic protection, spill overflow protection, tank release detection, and piping release detection. In each category, the choices were ranked based on their compliance with EPA requirements.

5.3.2. Results

5.3.2.1. Review of Existing Information

The OU-2 sump and tank database is attached in Appendix F. This database was reviewed to identify the active sumps and tanks within OU-2. This review identified 48 active sumps and tanks in OU-2. Two buildings hold the majority of the 48 active sumps and tanks. WD Building has 18 and T Building has 14 active sumps and tanks. The remaining 16 active sumps and tanks are located in nine OU-2 buildings

M, G, SD, 41, 58, 56, HH, and R). Information concerning the active sumps and tanks located in OU-2 is presented Table V.1. Locations of the active sumps and tanks within OU-2 are shown in Figure 5.1.

Tanks subject to Ohio's Bureau of Underground Storage Tank Regulations (BUSTR) require annual tank tightness tests. There is only one tank (117) that is subject to BUSTR requirements within OU-2. This tank passed a tank tightness test in April, 1994 was was removed in 1995. Four additional OU-2 tanks are treated as BUSTR tanks and receive annual tank tightness tests which they have passed. These tanks are 113, 114, 115, and 116 and were located at the P Building. (Cloud 1994) The tanks were removed in 1995.

The OU-8 investigation determined that the T Building USTs are not considered to be potential release sources (DOE 1992c) because the sumps and tanks in T Building were formed in the concrete floor when the building was constructed. The floor and walls were constructed of 10 foot thick reinforced concrete which reduces the possibility of a release.

The remainder of the active tanks in OU-2 are subject to the Atomic Energy Act (AEA) and the Clean Water Act (CWA). The AEA is the primary regulatory jurisdiction for 26 active sumps and tanks while the CWA is the primary regulatory jurisdiction for 22 sumps and tanks in OU-2 (Table V.1).

5.3.2.2. Field Inspection

The majority of the OU-2 sumps and tanks could not be visually inspected. Sumps were built into the floors of buildings and usually contained water which interfered with the inspection. Some sumps had unremovable lids or permanent piping that interfered with the removal of the lids. Tanks were usually underground and could not be visually inspected.

Visual inspection did identify four tanks with associated staining and stressed vegetation. These four tanks (113, 114, 115, and 116) located near P Building are underground storage tanks that contain fuel oil. They are treated as BUSTR tanks and receive annual tank tightness tests which they have passed. These four tanks were removed in 1995.

During field activities, a discrepancy with the previous investigations was discovered along with additional sumps and tanks that were not identified in the previous investigations. The general location of these sumps and tanks is presented in Figure 5.2. Discrepancies and the previously unidentified sumps and tanks are discussed below.

Table V.1. OU-2 Active Sump and Tank Information

ID	Bldg.	Room	Reference	Capacity (gallons)	Mound Program	Primary Regulatory Jurisdiction	Spill Jurisdiction	Date Installed	Purpose
3	WD	Deck	a,b	30,000	AUSTP	AEA	AEA	1947	alpha influent storage
4	WD	Deck	a,b	30,000	AUSTP	AEA	AEA	1947	alpha influent storage
5	WD	Deck	a,b	30,000	AUSTP	AEA	AEA	1947	alpha influent storage
6	WD	Deck	a,b	30,000	AUSTP	AEA	AEA	1947	alpha influent storage
7	WD	Dock 2	a,b	30,000	AUSTP	CWA	AEA	1947	alpha effluent storage
8	WD	Dock 2	a,b	30,000	AUSTP	CWA	AEA	1947	alpha effluent storage
9	WD	Dock 2	a,b	30,000	AUSTP	CWA	AEA	1947	alpha effluent storage
10	WD	Dock 2	a,b	30,000	AUSTP	CWA	AEA	1947	alpha effluent storage
11	WD	Annex	a,b	600	AUSTP	AEA	AEA	1966	hot sump
12	WD	Rm 1/Basement	a,b	600	AUSTP	AEA	AEA	1947	alpha wastewater sump
13	WD	Annex	a,b	3,750	AUSTP	AEA	AEA	1966	beta influent storage
14	WD	Annex	a,b	3,750	AUSTP	AEA	AEA	1966	beta influent storage
15	WD	Annex	a,b	3,750	AUSTP	AEA	AEA	1966	alpha influent storage
16	WD	Annex	a,b	3,750	AUSTP	AEA	AEA	1966	alpha influent storage
17	WD	Rm 01/sub-basement	a,b	500	AUSTP	CWA	AEA	1947	alpha wastewater sump
18	WD	Rm 8	a,b	450	AUSTP	CWA	AEA	1947	alpha wastewater sump
19	R	Rm 128	a,b	500	AUSTP	AEA	AEA	1981	alpha wastewater tank
20	SW	Rm SW 8	a,b	200	AUSTP	AEA	AEA	1950	beta wastewater tank
21	SW	Rm SW 125	a,b	100	AUSTP	AEA	AEA	1965	beta wastewater tank
22	SW	Rm SW 143	a,b	100	AUSTP	AEA	AEA	1965	beta wastewater tank
24	HH	outside Rm H-21	a,b	200	AUSTP	AEA	AEA	1974	beta wastewater sump
28	A	Rm A-10	a,b	400	AUSTP	AEA	AEA	1968	medical decon shower tank
29	A	Rm A-10	a,b	400	AUSTP	AEA	AEA	1968	medical decon shower tank
113	P	--	a,b	25,000	AUSTP	AEA	CWA	1947	fuel oil tank (tank 1)
114	P	--	a,b	25,000	AUSTP	AEA	CWA	1947	fuel oil tank (tank 2)
115	P	--	a,b	25,000	AUSTP	AEA	CWA	1965	fuel oil tank (tank 3)
116	P	--	a,b	25,000	AUSTP	AEA	CWA	1965	fuel oil tank (tank 4)
117	R	R/S/T Bldg Stack	a,b	5,000	AUSTP	BUSTR	BUSTR	1971	diesel fuel storage
119	M	Rm M-108	a,b	250	AUSTP	CWA	AEA	1980	metal plating rinse tank
120	R	Corridor 2	a,b	500	AUSTP	CWA	AEA	--	sanitary waste tank
124	T	Rm T-1	a,b	350	AUSTP	CWA	AEA	1947	cooling water sump
125	T	Corridor 2	a,b	350	AUSTP	CWA	AEA	1947	sanitary waste sump
126	T	Rm T-11 F	a,b	350	AUSTP	CWA	AEA	1947	sanitary waste sump
127	T	Rm T-15 A	a,b	350	AUSTP	CWA	AEA	1947	sanitary waste sump
128	T	Stair 3	a,b	350	AUSTP	CWA	AEA	1947	cooling water sump
129	T	Rm T-76	a,b	350	AUSTP	CWA	AEA	1947	condensate sump
130	T	Corridor 8	a,b	350	AUSTP	CWA	AEA	1947	sanitary waste sump
131	T	Rm T-76B	a,b	350	AUSTP	CWA	AEA	1947	sanitary waste sump
132	T	Rm T-90	a,b	350	AUSTP	CWA	AEA	1947	cooling system condensate sump
133	T	Rm T-99	a,b	350	AUSTP	CWA	AEA	1947	sanitary waste sump
134	WD	Rm 01	a,b	400	AUSTP	CWA	AEA	1947	sanitary waste sump
135	WD	Annex Rm-9	a,b	400	AUSTP	CWA	AEA	1967	sanitary waste sump
258	62	--	b	350	AUSTP	AEA	AEA	1973	hot waste sump
268	H	Breezway	b	350	AUSTP	CWA	AEA	1947	condensate sump
269	T	Rm T-90	b	350	AUSTP	CWA	AEA	1947	condensate sump
271	T	Rm T-1	b	10,000	AUSTP	AEA	AEA	1947	hot side fire water tanks
272	T	Rm T-20	b	200	AUSTP	AEA	AEA	1947	fire water sump
273	T	Rm T-37	b	200	AUSTP	AEA	AEA	1947	fire water sump

REFERENCES:
a) DOE, 1992c. "Mound Plant Underground Storage Tank Program Plan and Regulatory Status Review"
b) Dames & Moore, 1994. "Active Underground storage Tank Plan", May 16, 1994

NOTES:
NA = Not Applicable
-- = Information not available

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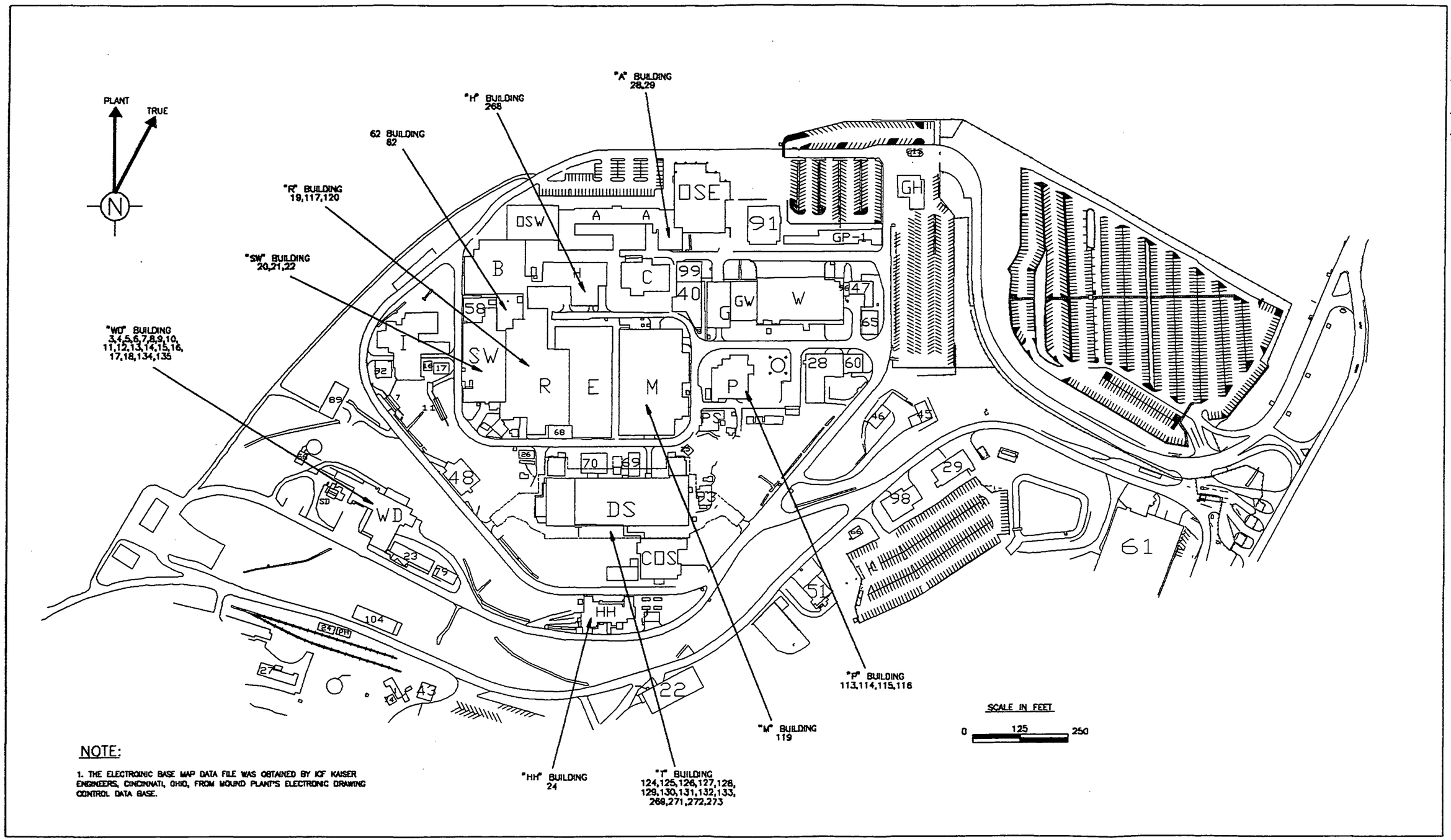


Figure 5.1. OU-2 Active Sump and Tank Locations

- P Building - A new tank was discovered adjacent to the P Building during visual inspection. This tank collects and then directs boiler blow down water to the sanitary sewer system. This tank was assigned the ID 280. A drawing showing the location of this sump in P Building is presented on Figure G.1 in Appendix G.

- A Building - Previous investigations identified Tanks 28 and 29 being located inside A Building. These tanks are located outside the south entrance to OSE. Also, three additional sumps were located in the basement of A Building. They have been assigned the IDs 281, 282, and 283. These sumps were visually inspected during field activities. A drawing showing the location of these sumps in A building is presented on Figure G.2 in Appendix G.

- WD Building - A new sump was located at the WD Building in room 12 during the visual inspection. This new sump was assigned the ID 284. No drawing is available showing the location of this sump.

During drawing review, additional sumps and tanks were identified. These sumps and tanks were not identified in previous investigations. A discussion on these sumps and tanks follows:

- P Building - Five sumps were identified inside the P Building. These sumps were not assigned an ID because they were not visually inspected. A drawing showing the location of the six additional sumps is presented in Figure G.1 in Appendix G.

- A Building - One sump was identified during drawing review. An ID was not assigned because the sump was not visually inspected. A drawing showing the locations of this sump is presented on Figure G.2 in Appendix G.

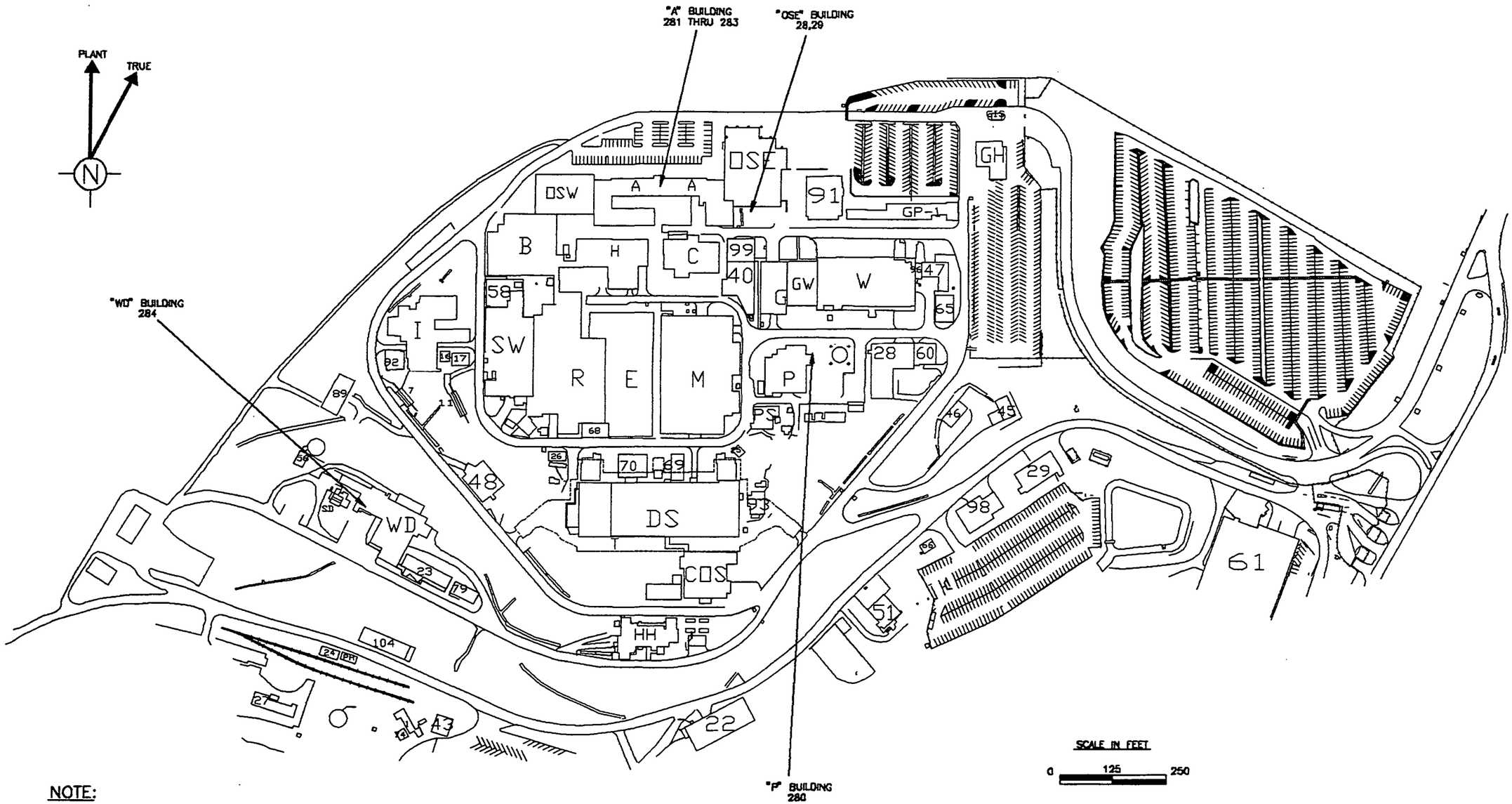
- R Building - During drawing review, two concrete pipes set into the bedrock in R Building were identified. These concrete pipes are 21 and 20 inches in diameter and extend below the floor approximately ten feet. The purpose of these pipes is unknown, but they may have acted as sumps. IDs were not assigned because the pipes were not visually inspected and they could not be determined to be sumps. A drawing showing the locations of these concrete pipes is presented on Figure G.3 in Appendix G.

- C Building - A sump was identified in C Building during drawing review. An ID was not assigned because this sump was not visually inspected. A drawing showing the location of this sumps is presented on Figure G.4 in Appendix G.

- SW Building - Six sumps were identified in SW Building during drawing review. These six sumps do not correspond to the five sumps already identified in the tank database (Appendix F) because the locations and room numbers do not match. These six sumps were all part of the original structure. These sumps were not visually inspected and therefore were not assigned IDs. A drawing showing the location of the six sumps is presented on Figure G.5 in Appendix G.

5.3.2.3. Sump and Tank Evaluation

To evaluate which, if any, active sumps and tanks warrant additional investigation, a ranking system was developed. Tanks that received tank tightness testing under BUSTR were eliminated from the ranking system as well as the sumps and tanks in T Building, and any new sump or tank that was discovered



NOTE:

1. THE ELECTRONIC BASE MAP DATA FILE WAS OBTAINED BY ICF KAISER ENGINEERS, CINCINNATI, OHIO, FROM MOUND PLANT'S ELECTRONIC DRAWING CONTROL DATA BASE.

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Figure 5.2. Discrepancy Tank Locations and Undocumented Field Identified Sumps and Tanks

during the OU-2 field investigation. T Building tanks were not ranked because they have been eliminated as potential release sources. Tanks and sumps that were discovered during the OU-2 field investigation were eliminated because the information on these sumps and tanks was incomplete. In all, 29 active sumps and tanks were included in the ranking system. The categorical choices can be seen in Table V.2, along with the score each sump or tank received in each category.

Each category was then given a weighting factor based on its estimated importance to the integrity of the sump or tank. The estimate importance of each category was determined based on available sump and tank information. These weighting factors were:

Tank material	5 (most important)
Tank release detection system	4
Piping release detection system	3
Cathodic protection system	2
Spill/Overflow protection system	1

Each sump and tank was scored in these five categories. If the sump/tank met EPA criteria, it was assigned a category score of 2. If no, it was assigned a score of 1. This score was then multiplied by the weighting factor to calculate an overall score for each category. Table V.3 lists a summary of sump and tank scores.

For each tank, the category scores were summed to determine the total points each sump or tank received. The total possible score was 30 (sum of the highest category rank times the appropriate category weighting factor). If a tank met all of the EPA requirements for new underground storage tanks, the total possible score was 30 points. If a tank scored at least 20 points (66 %), the integrity of the tank was considered acceptable. If the tank scored 20 points, the tank had to be either constructed of EPA required material for new tanks or had a tank release detection system. These two categories weighted the highest out of the five categories. Of the 29 sumps and tanks ranked, 9 were rated as having acceptable integrity. These tanks are 3, 4, 5, 6, 20, 21, 22, 28, and 29.

Table V.2. OU-2 Sump and Tank Ranking System

ID	Bldg.	Room	Tank Material	R	Tank Cathodic Protection System	R	Spill/Overfill Protection System	R	Tank Release Detection System	R	Piping Release Detection System	R
3	WD	Deck	steel lined concrete	1	epoxy lining	2	high level alarm	2	secondary containment w/ interstitial monitoring	2	none	1
4	WD	Deck	steel lined concrete	1	epoxy lining	2	high level alarm	2	secondary containment w/ interstitial monitoring	2	none	1
5	WD	Deck	steel lined concrete	1	PVC lined	2	high level alarm	2	secondary containment w/ interstitial monitoring	2	none	1
6	WD	Deck	concrete	1	epoxy lining	2	high level alarm	2	secondary containment w/ interstitial monitoring	2	none	1
7	WD	Dock 2	concrete	1	epoxy lining	2	datalogger from level indicator	2	none	1	none	1
8	WD	Dock 2	concrete	1	epoxy lining	2	datalogger from level indicator	2	none	1	none	1
9	WD	Dock 2	concrete	1	epoxy lining	2	datalogger from level indicator	2	none	1	none	1
10	WD	Dock 2	concrete	1	epoxy lining	2	datalogger from level indicator	2	none	1	none	1
11	WD	Annex	steel lined concrete	1	PVC lining	2	on/off ball float switch	2	none	1	none	1
12	WD	Rm 1/Basement	steel lined concrete	1	none	1	on/off ball float switch	2	none	1	none	1
13	WD	Annex	steel lined concrete	1	none	1	none	1	none	1	none	1
14	WD	Annex	steel lined concrete	1	none	1	none	1	none	1	none	1
15	WD	Annex	steel lined concrete	1	none	1	none	1	none	1	none	1
16	WD	Annex	steel lined concrete	1	none	1	none	1	none	1	none	1
17	WD	Rm 01/sub-basement	steel lined concrete	1	none	1	on/off ball float switch	2	none	1	none	1
18	WD	Rm 8	concrete	1	vitrified clay	2	ball float switch	2	none	1	none	1
19	R	Rm 128	double fiberglass set in concrete	1	none	1	high level alarm/auto shut off	2	none	1	none	1
20	SW	Rm SW 8	s/s lined steel	1	none	1	high level alarm/ball float on/off	2	secondary containment w/ interstitial monitoring	2	none	1
21	SW	Rm SW 125	s/s lined steel	1	none	1	high level alarm/ball float on/off	2	secondary containment w/ interstitial monitoring	2	none	1
22	SW	Rm SW 143	s/s lined steel	1	none	1	high level alarm/ball float on/off	2	secondary containment w/ interstitial monitoring	2	none	1
24	HH	outside Rm H-21	steel lined concrete	1	none	1	none	1	none	1	none	1
28	A	Rm A-10	PVC lined steel	2	none	1	high level alarm	2	none	1	none	1
29	A	Rm A-10	PVC lined steel	2	none	1	high level alarm	2	none	1	none	1
119	M	Rm M-108	concrete	1	epoxy	2	none	1	none	1	none	1
120	R	Corridor 2	stainless steel	1	none	1	high level alarm ball float switch	2	none	1	none	1
134	WD	Rm 01	steel lined concrete	1	none	1	on/off float level switch	2	none	1	none	1
135	WD	Annex Rm-9	concrete	1	none	1	on/off float level switch	2	none	1	none	1
258	62	--	concrete	1	none	1	on/off level float switch	2	none	1	none	1
268	H	Breezeway	steel lined concrete	1	none	1	on/off float switch	2	none	1	none	1

LEGEND: NA = Not Applicable
-- = Information not available
R = Rank
PVC = poly vinyl chloride

Tank Material 1.)	R	Tank Cathodic Protection System	R	Spill/Overfill Protection System	R	Tank Release Detection System	R	Piping Release Dete	R
Weight = 5		Weight = 2		Weight = 1		Weight = 4		Weight = 3	
Meets EPA Standards	2	Yes	2	Yes	2	Yes	2	Yes	2
Does not meet EPA standards/Unk	1	No/Unknown	1	No/Unknown	1	No/Unknown	1	No/Unknown	1

NOTES: 1.) EPA standards per 40 CFR Parts 280 and 281.

TABLE V–3
ACTIVE SUMPS AND TANKS RANKING

ID	Tank Material	Cathodic Protection System	Overflow Protection System	Release Detection System	Release Detection System	Total Score 1.)	Percentage 2.)
Weight =	5	2	1	4	3	NA	NA
3	5	4	2	8	3	22	73.33%
4	5	4	2	8	3	22	73.33%
5	5	4	2	8	3	22	73.33%
6	5	4	2	8	3	22	73.33%
7	5	4	2	4	3	18	60.00%
8	5	4	2	4	3	18	60.00%
9	5	4	2	4	3	18	60.00%
10	5	4	2	4	3	18	60.00%
11	5	4	2	4	3	18	60.00%
12	5	2	2	4	3	16	53.33%
13	5	2	1	4	3	15	50.00%
14	5	2	1	4	3	15	50.00%
15	5	2	1	4	3	15	50.00%
16	5	2	1	4	3	15	50.00%
17	5	2	2	4	3	16	53.33%
18	5	4	2	4	3	18	60.00%
19	5	2	2	4	3	16	53.33%
20	5	2	2	8	3	20	66.67%
21	5	2	2	8	3	20	66.67%
22	5	2	2	8	3	20	66.67%
24	5	2	1	4	3	15	50.00%
28	10	2	2	4	3	21	70.00%
29	10	2	2	4	3	21	70.00%
119	5	4	1	4	3	17	56.67%
120	5	2	2	4	3	16	53.33%
134	5	2	2	4	3	16	53.33%
135	5	2	2	4	3	16	53.33%
258	5	2	2	4	3	16	53.33%
268	5	2	2	4	3	16	53.33%
AVG	5.34	2.76	1.79	4.97	3.00	17.86	59.54%

LEGEND: NA = Not Applicable.
AVG = Average.

NOTES: 1.) The total score is the sum of each category times the weight factor assigned to each category. The total possible score is 30.
2.) The percentage is calculated by the total score/total possible points.

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5.4. INACTIVE SUMPS AND TANKS

5.4.1. Summary of Activities

5.4.1.1. Review of Existing Information

The OU-2 sump and tank database (Appendix F) was reviewed to identify inactive sumps and tanks. From the inactive sumps and tanks, removed, closed-in-place, and not-in-service sump and tanks were identified. Removed sumps and tanks were the basis for the verification sampling evaluation.

5.4.1.2. Evaluation of Removed Sumps and Tanks

For sumps or tanks removed from service, the results of the D&D activities or other Mound Plant programs were to be assessed to determine if verification sampling performed meets the DQOs established in the RI or the standards specified in the USEPA guidance document "Methods for Evaluating Attainment of Cleanup Standards, Volume 1, Soils and Solid Media. 1989". Additional investigation could be warranted if the verification sampling is found not to conform to the these criteria.

5.4.2. Results

5.4.2.1. Review of Existing Information

This review identified 33 inactive sumps and tanks located within OU-2. Information concerning the OU-2 inactive sumps and tanks is presented in Table V.4. Locations of the inactive sumps and tanks located within OU-2 are shown in Figure 5.3.

Removed sumps and tanks have been physically removed by means of excavation or demolition. There were seven sumps and tanks (202, 203, 204, 208, 209, 222, and 223) in OU-2 that fall under this category. Five removed tank locations (202, 203, 204, 222, and 223) are assigned to the ER program under the OU-2 RI/FS. Two sump and tank locations are assigned to the D&D program.

Closed-in-place sumps and tanks have undergone preliminary closure activities such as filling the interior of the sump or tank with concrete or gravel. These activities are intended to serve as an interim measure to allow reuse of an area or to reduce the potential for a release. Sumps and tanks that have had interim measures are not considered closed until final action has been taken that is consistent with the

Table V.4. OU-2 IOnactive Sumps and Tank Information

ID	Bldg.	Room	Reference	Mound Program	Primary Regulatory Jurisdiction	Spill Jurisdiction	Status	Date Installed	History of Spills	Substance Last/Currently Stored	Date Last Used	Notes
2	H	Rm H-133	a,b	D&D	AEA	AEA	Inactive	1947	No	Rad. ww	1991	
23	SW	Rm SW 137	a,b	D&D	AEA	AEA	Inactive	1950	No	Rad. ww	--	
202	G	--	a,b	ER	FFA	FFA	Removed	1947	Yes	Gasoline	1964	removed 1988
203	G	--	a,b	ER	FFA	FFA	Removed	1964	Yes	Gasoline	1964	removed 1988
204	G	--	a,b	ER	FFA	FFA	Removed	1975	Yes	Gasoline	1988	removed 1988
205	Old SD	--	a,b	D&D	AEA	AEA	Inactive	1947	Yes	Sanitary ww	1975	
206	Old SD	--	a,b	D&D	AEA	AEA	Inactive	1947	Yes	Sanitary ww	1975	
207	Old SD	--	a,b	D&D	AEA	AEA	Inactive	1947	Yes	Sanitary ww	1975	
208	41	--	a,b	D&D	AEA	AEA	Removed	1968	Yes	Rad. ww	1988	removed 1988
209	41	--	a,b	D&D	AEA	AEA	Removed	1968	Yes	Rad. ww	1988	removed 1988
214	WD	Annex	a,b	D&D	AEA	AEA	Inactive	1968	No	Rad. ww	1975	to be removed?
215	WD	Annex	a,b	D&D	AEA	AEA	Inactive	1968	No	Rad. water	1975	to be removed?
216	WD	Annex	a,b	D&D	AEA	AEA	Inactive	1968	No	Rad. water	1975	to be removed?
222	58	--	a,b	ER	FFA	FFA	Removed	1973	No	Diesel	12/16/89	replaced 1990?
223	56	--	a,b	ER	FFA	FFA	Removed	1972	No	Diesel	12/16/89	replaced 1990?
225	M	Rm M-38	a,b	ER	FFA	FFA	Inactive	1969	No	Industrial ww	1984	to be removed?
226	SW	Rm SW-10	a,b	D&D	AEA	AEA	Inactive	1967	No	Rad. water	--	
227	T	Rm T-23	a,b	D&D	AEA	AEA	Closed in place	1947	No	Rad. water	1975	Closure not complete
228	T	Rm T-3	a,b	D&D	AEA	AEA	Closed in place	1947	No	ww	1984	Closure not complete
229	T	Rm T-40	a,b	D&D	AEA	AEA	Closed in place	1947	No	Rad. ww	1983	Closure not complete
230	T	Rm T-41	a,b	D&D	AEA	AEA	Closed in place	1947	No	Rad. ww	1983	Closure not complete
231	T	Rm T-50	a,b	D&D	AEA	AEA	Closed in place	1947	No	Rad. ww	1970-1975	Closure not complete
232	T	Rm T-50	a,b	D&D	AEA	AEA	Closed in place	1947	No	Rad. ww	1970-1975	Closure not complete
233	T	Corridor 8	a,b	D&D	AEA	AEA	Closed in place	1947	No	Rad. ww	1982	Closure not complete
234	T	Corridor 7	a,b	D&D	AEA	AEA	Closed in place	1947	No	Rad. ww	1982	Closure not complete
235	T	Rm T-63	a,b	D&D	AEA	AEA	Closed in place	1947	No	Rad. ww	1982	Closure not complete
236	HH	Rm HH-15	a,b	D&D	AEA	AEA	Inactive	1967	No	Rad. water	1975	
237	HH	Rm HH-6	a,b	D&D	AEA	AEA	Closed in place	1947	No	Rad. water	1961	Filled with concrete
250	T	Rm T-44	b	D&D	AEA	AEA	Closed in place	1947	No	ww	1984	Filled with concrete
251	T	Rm 16-B	b	D&D	AEA	AEA	Closed in place	1947	No	ww	1984	Filled with concrete
255	R	Rm R-111	b	D&D	AEA	AEA	Inactive	1967	No	Deionized water	--	
262	G	--	b	D&D	AEA	AEA	Inactive	1947	--	Used oil	--	No paper work
266	R	Rm R-111	b	D&D	AEA	AEA	Inactive	1967	No	Deionized water	--	

REFERENCES:
a) DOE, 1992c. "Mound Plant Underground Storage Tank Program Plan and Regulatory Status Review"
b) Dames & Moore, 1994. " Active Underground storage Tank Plan", May 16, 1994 (Dames & Moore)

NOTES:
NA = Not Applicable
-- = Information not available
ww = wastewater

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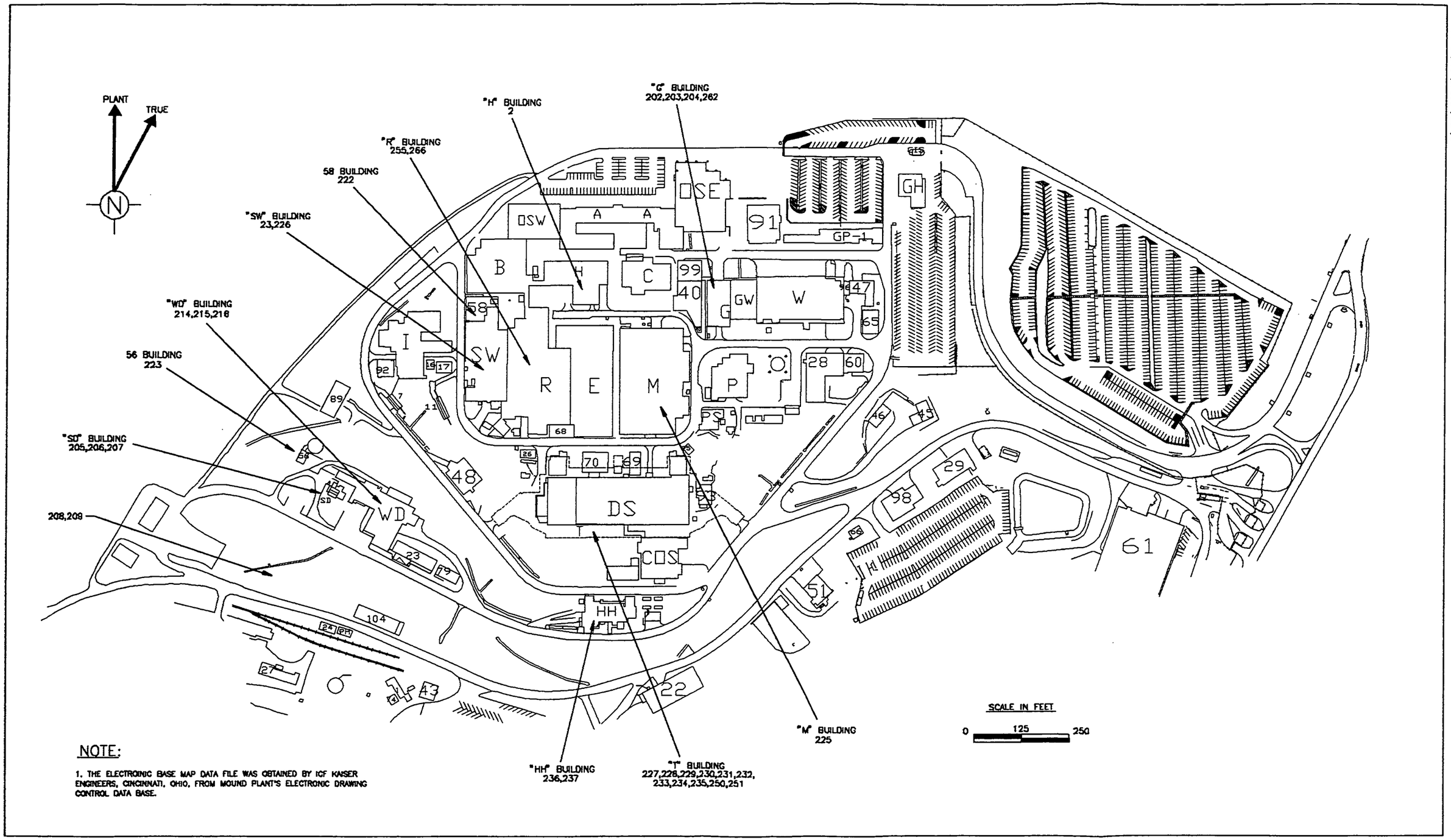

Figure 5.3. OU-2 Inactive Sumps and Tanks Locations

appropriate regulatory program. Currently there are 12 closed-in-place tanks (227, 228, 229, 230, 231, 232, 233, 234, 235, 237, 250, and 251) within OU-2. All of these tanks are assigned to the D&D Program.

Not-in-service (inactive) sumps and tanks are present on-site, but are not currently in use and there are no plans for their use. There are 14 sumps and tanks (2, 23, 205, 206, 207, 214, 215, 216, 225, 226, 236, 255, 262, and 266) that fall into this category. All are assigned to the D&D program.

Some not-in-service and closed-in-place sumps and tanks are part of the physical structure of a building still in use. These sumps and tanks will not be removed until the building in which they are present is permanently decommissioned.

One tank (262) was identified during the Dames & Moore (1994) investigation by means of a drawing review. This tank was used to store waste oil from G Building. The tank was installed when G Building was constructed and appears to be located under GW Building. No information was found indicating if the tank was removed or if verification sampling was performed. The Dames & Moore report proposed that tank 262 be assigned to the D&D program.

5.4.2.2. Evaluation of Removed Sumps and Tanks

Personnel at Mound Plant were contacted for verification sampling results or closure reports on the seven removed sumps and tanks (202, 203, 204, 208, 209, 222, and 223). The manager of the AUSTP reported that there are no sampling results except for those reported in the document "Active Underground Storage Tank Program Plan" (Dames & Moore 1994). This document was reviewed under the OU-2 sump and tank investigation and there are no sampling results presented in this document, but does contain general information on the removal of the sumps and tanks.

Two removed tanks (208, 209) are currently assigned to the D&D program and will be verified under OU-6. The objective of activities conducted under OU-6, is to verify D&D activities. The 12 closed-in-place and 14 not-in-service sumps and tanks are all assigned to the D&D program. Once final D&D activities are completed on these sumps and tanks, the D&D activities will be verified under the ER program by OU-6.

5.5. ABOVE GROUND STORAGE TANKS

5.5.1. Field Implementation

Visual inspection was performed on aboveground storage tanks (ASTs) located within OU-2. This inspection was performed to evaluate if the tanks had the potential for a release. Potable water tanks

were not included in this inspection. This inspection was performed on August 25, 1994 and was consistent with the visual inspection performed on the active sumps and tanks discussed in Section 5.3.1.2.

5.5.2. Results

Twenty ASTs were identified during the field investigation. Locations of these ASTs are presented in Figure 5.4. Information obtained during visual inspection is presented Table V.5. The majority of the tanks were process gas tanks, including seven liquid nitrogen tanks, one argon, and one propane tank. Four effluent removal system (ERS) tanks were identified. ERS tanks store water containing tritium. Two diesel fuel storage tanks and two chemical storage tanks were also identified during visual inspection. The potable water tanks were not included in this inspection.

Visual inspection identified two areas of concern associated with ASTs. The first area is near AST-11, which supplies generator #4 with diesel fuel. Generator #4 is housed in a metal shed on a concrete pad to the east of PS Building. There is visible staining on the pad outside the shed. It appears that the staining originates from inside the shed.

The second area is near AST-17. The bottom of the tank appeared to have separated from the sides of the tank, resulting in the AST releasing its contents to secondary containment. A yellowish liquid was visible in the secondary containment. There was also a small amount of staining near the drain valve of the secondary containment. The AST contents could not be identified at the time of the investigation, however, as the area around the AST was roped off and marked "caustic".

5.6. CONCLUSIONS

5.6.1. Active Sumps and Tanks

Based on the findings of the visual inspection, and categorical ranking, additional testing is warranted on several of the active sumps and tanks. Additional testing may include hydrostatic, volumetric, or pressure testing to confirm the integrity of the sumps and tanks that were ranked questionable. The questionable sumps were 11, 12, 17, 18, 24, 134, 135, 258, and 268. Questionable tanks include 7, 8, 9, 10, 13, 14, 15, 16, 19, 119, and 120.

The OU-2 sump and tank inspection identified two tanks (28 and 29) that were previously reported as being in A building. Their actual location is outside the south entrance to OSE Building. This investigation also identified two sumps (280, 281) that were not previously documented. Sump 280 is

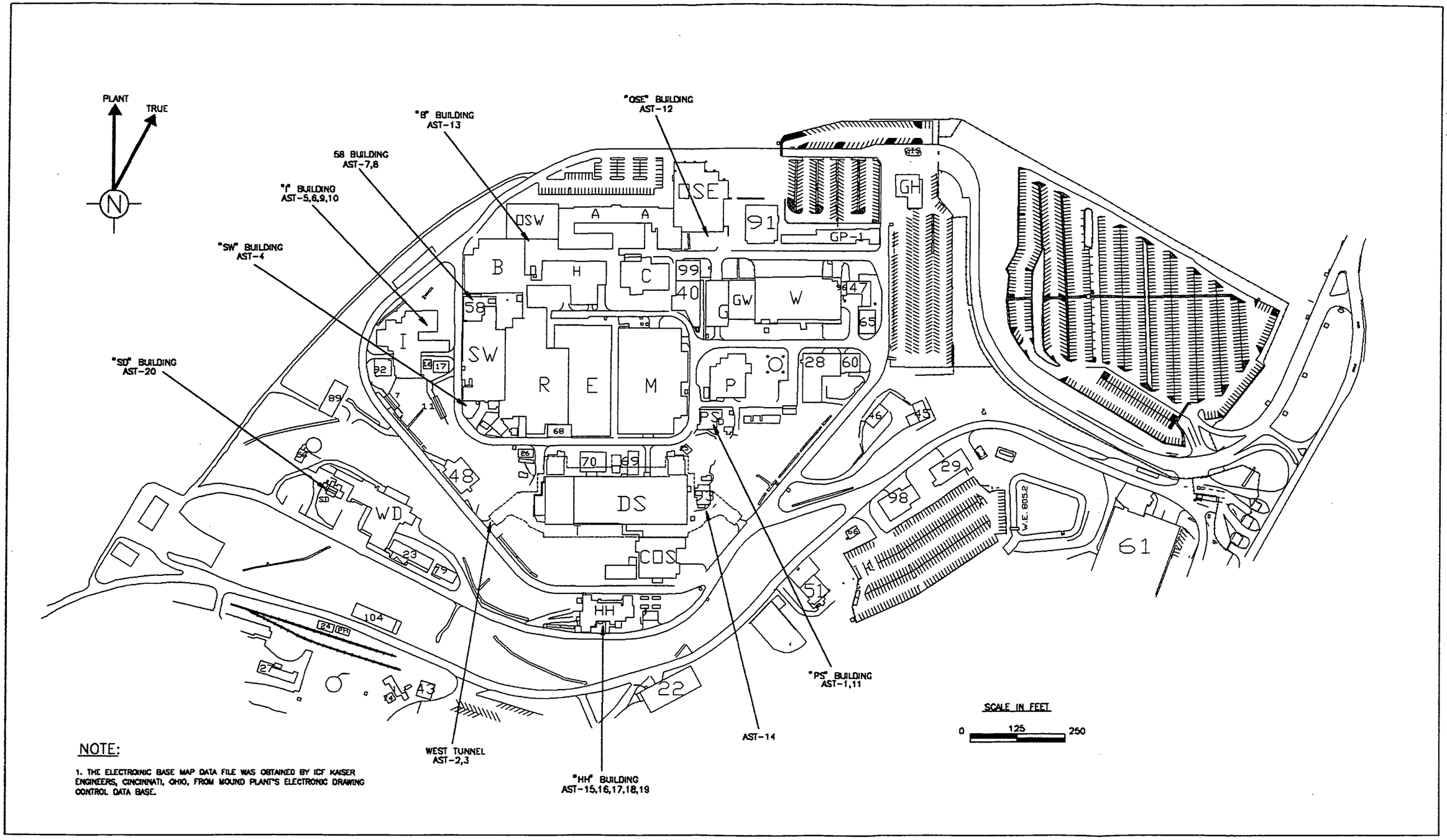

Figure 5.4. OU-2 Aboveground Storage Tank Locations

Table V.5. Above Ground Storage Tank Information

ID	Bldg.	Substance Stored	Capacity (gallons)	Tank Material	Tank Condition	Tank Site Description	Visible Staining	Secondary Containment	Secondary Containment Condition	Status	Notes
AST-1	PS/25	Liquid Argon		Steel	Good	Outdoor	No	No	NA	In service	Contents under pressure
AST-2	West Tunnel	Effluent Removal System	25000	Steel	Good	Outdoor	No	No	NA	In service	Used for tritium removal in water
AST-3	West Tunnel	Effluent Removal System	25000	Steel	Good	Outdoor	No	No	NA	In service	Used for tritium removal in water
AST-4	SW	Effluent Removal System	10000	Steel	Good	Outdoor	No	No	NA	--	Used for tritium removal in water
AST-5	I	Liquid Nitrogen	6500	Steel	Good	Outdoor	No	No	NA	In service	
AST-6	I	Liquid Nitrogen	6500	Steel	Good	Outdoor	No	No	NA	--	Marked "asphyxiant", under pressure, 245 psi
AST-7	58	Effluent Removal System	--	Steel	Good	Outdoor	No	No	NA	--	Used for tritium removal in water
AST-8	SW & B	Diesel fuel	1000	Steel	Good	Outdoor	No	Yes	Light rust	In service	For generator at Bldg. 58
AST-9	I	--	500	Steel	Light Rust	Outdoor	No	No	NA	--	Appear to be liquid nitrogen, but had no markings
AST-10	I	--	500	Steel	Light Rust	Outdoor	No	No	NA	--	Appear to be liquid nitrogen, but had no markings
AST-11	I	Diesel Fuel	250	Steel	Good	Outdoor	Yes	No	NA	In service	For generator #4
AST-12	OSE	Liquid Nitrogen	500	Steel	Good	Outdoor	No	No	NA	In service	Under 250 psi pressure
AST-13	B	Liquid Nitorgen	--	Steel	Good	Outdoor	No	No	NA	In service	
AST-14	COS	Liquid Nitrogen	--	Steel	Good	Outdoor	No	No	NA	In service	
AST-15	HH	Liquid Nitrogen	--	Steel	Good	Outdoor	No	No	NA	In service	
AST-16	HH	Liquid Nitrogen	--	Steel	Good	Outdoor	No	No	NA	--	
AST-17	HH	Chemical Storage	1000	Steel	Holes/Rust/Cracks	Outdoor	Yes	Yes	Good	Inactive	Ruptured bottom, soil staining outside containment
AST-18	HH	Chemical Storage	1000	Steel w/ fiberglass coating	Rust	Outdoor	No	Yes	Good	Inactive	
AST-19	HH	--	10000	Fiberglass	Good	Outdoor	No	No	NA	Inactive	
AST-20	SD	Propane	500	--	Good	Outdoor	No	No	NA	In service	

REFERENCES: OU-2 Abovegound Storage Tank Field Investigation.

NOTES: NA = Not Applicable
-- = Information not available

AST.WK1/DATA-E
50942-002-00

located outside P Building and collects boiler blow down water, which is then pumped to the sanitary sewer system. Sump 281 is located in the WD Building in room 12. The function of this sump is not known.

An additional 13 sumps and tanks and two possible sumps were identified during drawing review. These sumps and tanks were not visually inspected and therefore not given IDs. The number and location of these sumps and tanks are as follows: five sumps in P Building, one sump in A Building, one sump in C, and six sumps in SW building. Two possible sumps were identified in R Building.

Mound Plant's AUSTP is responsible for assigning sumps and tanks to the appropriate regulatory and corresponding EG&G MAT program. The AUSTP should confirm the status of the sumps and tanks that were identified during the OU-2 investigation and assign them to the appropriate program.

5.6.2. Inactive Sumps and Tanks

Verification sampling and closure documentation, as reported by Mound Plant personnel, does not exist for the seven removed sumps and tanks (202, 203, 204, 208, 209, 222, and 223) within OU-2. Five of these tanks (202, 203, 204, 222, and 223) are assigned to the ER program under OU-2. These five sumps and tanks have been given a level I category under the OU-2 RI/FS. The level I category includes all OU-2 areas that are not sufficiently addressed in any other Operable Unit and require further investigation and sampling. These tank locations are discussed in the OU-2 RI/FS WP and will be addressed in the OU-2 Phase I Reconnaissance Report.

The Dames & Moore (1994) report proposed that tank 262 be assigned to the D&D program. Based on the substance stored in the tank (waste oil) and lack of information regarding the tank, it is recommended that this tank be assigned to the ER program for further investigation. This tank will be addressed in the OU-2 Phase I reconnaissance report.

5.6.3. Aboveground Storage Tanks

Visual inspection identified two ASTs that warrant additional investigation. These tanks are AST-11 and AST-17. There is visible staining on the concrete pad outside the metal shed that contains AST-11. It appears that the staining originates from inside the metal shed. The second area is near AST-17, which had a ruptured bottom. The tank bottom appeared to have rusted from the sides of the tank resulting in the AST releasing its contents to secondary containment. A yellowish liquid was visible in the secondary containment. There was also a small amount of staining near the drain valve of the secondary containment. These two ASTs will be addressed in the OU-2 Phase I Reconnaissance Summary Report.

SECTION 6

6. SUMMARY

The objectives of the OU-2 RI/FS are to define the nature and extent of the contamination found on the Main Hill, characterize the risks to human health and the environment posed by exposure to the various affected medium, and to evaluate the potential remedies that could reduce these risks to acceptable levels. Phase I of the OU-2 RI was initiated in April 1994. Phase I is the reconnaissance investigation and was conducted to collect information and assist in preparing the scope of work for the remaining phases of the investigation.

6.1. STORM AND SANITARY SEWERS

The objectives of this subtask were to produce an accurate map showing the locations of the storm and sanitary sewer lines within OU-2; confirm the locations by field verification and location surveying; evaluate the integrity of the storm and sanitary sewers by a video survey; and produce a map identifying potential areas of leakage from the storm and sanitary sewers.

Storm and sanitary sewer drawings were obtained from Mound Plant's CAD Department. A field reconnaissance was performed on the storm and sanitary sewer manholes to verify their locations, determine the accuracy of the drawings provided by Mound Plant, and identify manholes of questionable integrity. Several manholes were identified during the field reconnaissance that had been removed, relocated, or were of questionable integrity. Results of the field reconnaissance and manhole inspection for the storm and sanitary sewer systems are presented in Table II.2 and II.3, respectively. Storm and sanitary manholes that are documented in these tables are identified in Figures 2.3. and 2.4., respectively.

A location survey was conducted to assist in preparation of a map of the storm and sanitary sewers within OU-2. The surveying activities precisely located the storm and sanitary sewer manholes, storm sewer outfalls, headwalls, and storm drains. The surveyed locations were compared to the drawings provided by Mound Plant to verify their accuracy. Surveyed locations were incorporated into the storm and sanitary sewer drawings (Appendix B) to produce a map of the storm and sanitary sewers.

The video survey revealed information regarding the condition of the storm and sanitary sewer lines in OU-2. Out of the 5,916 feet of sanitary sewers and 14,291 feet of storm sewers that were at least eight inches in diameter, 3,410 feet of sanitary and 8,329 feet of storm lines were video surveyed (Figures 2.5. and 2.6.). The video survey documented pipe conditions which may be potential leakage areas from the storm and sanitary sewers. Observations that were documented during the video inspection include offset joints, separated joints, circular cracks, longitudinal cracks, surface cracks, possible leaky joints, pipe

changes, crushed pipes, holes, missing pieces of pipe, holes, unmapped service connections, eroded pipes, bellies, and roots in the pipes.

Locations and types of defects were synthesized to produce a map of potential leakage areas (Appendix B). To identify whether these areas are leaking, additional investigation of the storm and sanitary sewers should be performed. The map of potential leakage areas will be used during RI scoping activities to identify areas for additional investigation. The scope of the additional investigations will be addressed in the OU-2 RI Phase I Reconnaissance Summary Report.

6.2. OTHER SUBSURFACE LINES

This section addresses other subsurface utilities including pressurized line (fire and domestic water supply), hazardous waste lines, electric, ADT, telephone, and utility trenches.

6.2.1. Fire and Domestic Water Lines

The objectives for the fire and domestic water supply lines were to obtain maps showing the locations of pressurized lines, confirm their locations by field verification where possible, evaluate the integrity of the lines, and produce a map identifying the potential areas of leakage from the pressurized lines.

Fire and domestic water supply line drawings were compiled from the CAD Department at Mound Plant. Drawings were reviewed to identify the locations of the fire and domestic water supply lines. Since these systems are underground, verification of their locations by a field reconnaissance was not possible. The accuracy of the locations of fire and domestic water supply lines on the Mound Plant drawings could not be determined by the field reconnaissance.

Pressure line testing was proposed for the fire and domestic water supply lines to determine their integrity and to evaluate if they were contributing fluids to the subsurface. Pressure line testing is typically performed by isolating a section of the line to be tested from other input sources. Subcontractors were contacted concerning pressure line testing. The subcontractors reported that to accurately locate leaks the lines have to be tested every twenty feet. This would require digging access holes to the fire and domestic water lines, breaking the lines at both ends, performing the test, sealing the breaks in the line, filling the access hole, and repaving the access areas. Due to the high cost, time required, and the damage that would be caused to the pressurized lines, it was decided not to perform this type of testing on the pressurized lines.

Mound personnel reported that Building 56 houses a "jockey" pump which pumps fire supply water from the water storage tank to the fire water supply lines. The pump's purpose is to supply the fire water lines with water. The fire water lines are pressurized at 115 psi. When the pressure in the fire water supply lines drops below 75 psi the pump starts and pumps water into the fire water supply lines (Heights 1994).

Mound Plant determines a leakage rate from the fire water supply lines by how long the pump runs and time between cycles. A ratio between these two times is determined and then multiplied by the pump's capacity (Bremer 1994). It was reported that the standard leakage rate for Mound Plant's fire water supply system is 4.5 gpm. This leakage rate calculated over a one year period would amount to 2.3 million gallons of water that are lost from the fire water supply lines. This estimate is considered more reliable than the 10.0 gpm estimate provided verbally by Mound personnel documented in the Main Hill Seeps and Drains Technical Memorandum as it is based on actual data. However, no documentation on the weekly pump tests are kept. Due to this, an accurate estimate of water that is released yearly cannot be determined. In addition, the normal leakage rate occurs over the entire Mound Plant and is not limited to OU-2. The amount of water that is contributed to the subsurface within the boundaries of OU-2 is unknown. Additional investigations on the fire lines are necessary to determine the quantity of water that is being contributed to the subsurface within OU-2 and in what areas.

6.2.2. Hazardous Waste Lines

Objectives for the hazardous waste line investigation were to produce a map of line locations and confirm their locations by field verification. These maps will be used in future RI phases to assist in determining if water has the potential to move laterally along their underground trenches.

Hazardous waste line drawings were compiled from the CAD Department at Mound Plant. Drawings were reviewed to identify the locations of the hazardous waste lines. A field reconnaissance was performed on the hazardous waste lines to verify the locations of the manholes and determine the accuracy of the drawings provided by Mound Plant. Locations of the hazardous waste manholes found in the field were compared with those on the drawings.

Field reconnaissance did not identify any new, relocated, or removed hazardous waste line structures. Locations of hazardous waste line manholes are presented in Figure 3.3. Exact locations of these lines are being surveyed under OU-6. Hazardous waste lines will need to be evaluated, in future phases, to determine if water has the potential to migrate along the underground trenches associated with these waste lines.

6.2.3. Electric, ADT, and Telephone Lines

Objectives for the electric lines, ADT lines, and telephone line investigation were to obtain maps of these utilities and confirm their locations by field verification. These maps will be used in future RI phases to assist in determining if water has the potential to move laterally along their underground trenches.

Electric, ADT, and telephone line drawings were compiled from the CAD Department at Mound Plant. The drawings were reviewed to identify the locations of these lines. Field reconnaissance was performed in an attempt to verify the accuracy of the electric, ADT, and telephone line drawings but due to the layout of the three systems, field verification was not possible. The three systems are not divided into separate and distinct underground utilities. For these three systems there are two different types of manholes or vaults, one for telephone and one for electrical. At various locations, it appeared that telephone lines were run through electrical manholes, and at other locations electrical lines through telephone manholes. At most locations, the ADT lines ran in sequence with the electrical lines but not always. The drawing provided by Mound Plant for the electric, ADT, and telephone lines are presented in Figures 3.4, 3.5, and 3.6, respectively. The electric, ADT, and telephone lines should be evaluated, in future phases, to determine if water has the potential to migrate along underground trenches associated with these utilities.

6.2.4. Utility Trenches

Objectives for the utility trench investigation were to obtain an accurate map of their locations and confirm their locations by field verification. These maps will be used in future RI phases to assist in determining if water has the potential to move laterally along these utility trenches.

A drawing review identified six underground utility trenches located by Buildings OSW, A, P, PS, 26 and R. Site reconnaissance was performed to verify the existence of the six utility trenches identified in the drawing review. During the site reconnaissance, two utility trenches were verified and conformed to the provided drawing. The other four utility trenches could not be verified by field reconnaissance. Trenches that were field identified were not inspected internally but were reported to contain pressurized lines and water lines. Other trenches were reported to transport air and contain electric lines. The utility trenches will be evaluated, in future phases, to determine if water has the potential to migrate within these trenches.

6.3. SURFACE DRAINAGE

Objectives of this subtask were to produce an accurate map of the OU-2 surface water drainage and determine the areas of potential infiltration to the groundwater from the surface water drainage system.

These areas will be investigated in future RI phases to evaluate if infiltration is providing a migration route to the subsurface.

Surface drainage drawings were compiled from the CAD Department at Mound Plant. Drawing review was conducted to identify the surface drainage structures in OU-2. Field reconnaissance verified the accuracy of the surface water drainage map provided by Mound Plant. The surface water drainage map was updated to incorporate new and relocated surface water drainage structures. Storm sewer outfalls and head walls were surveyed during the horizontal and vertical location surveying activities for the storm and sanitary sewers. These surveyed locations were utilized in producing an accurate surface water drainage map. An updated surface water drainage map is attached in Appendix E.

Field reconnaissance was to identify drainage structures that allowed water to pond. To accomplish this, field reconnaissance was performed during a wet period to identify the drainage areas that allowed water to pond and then again during a dry period to determine which ponded areas remained. This determined which drainage areas had the potential to allow water to infiltrate to the subsurface.

The field reconnaissance identified 18 potential infiltration areas to the subsurface. These areas are presented in Table IV.1. and identified on the surface water drainage map in Appendix E. Further investigations of the potential areas of infiltration should be conducted to determine if these areas act as a migration route to the subsurface. These additional investigations may require soil sampling, soil vapor analysis, and dye tracing of the surface water to the subsurface. Additional investigations will be addressed in the OU-2 Phase I Reconnaissance Summary Report.

6.4. SUMPS AND TANKS

Objectives of this subtask were to evaluate the integrity of the active underground sumps and tanks and aboveground tanks within OU-2 and assess their potential to contribute to the subsurface. In addition, the sumps and tanks that have been removed from service within OU-2 were to be assessed to evaluate whether the closure activities and verification sampling performed meet the DQOs established in the OU-2 RI/FS WP.

6.4.1. Active Sumps and Tanks

Previous investigations were reviewed to create a database of the OU-2 sumps and tanks. This database contains information regarding all of the sumps and tanks in OU-2 and includes active and inactive sumps and tanks. The OU-2 sump and tank database is attached in Appendix F.

This database was reviewed to identify the active sumps and tanks within OU-2. Forty eight (48) active sumps and tanks in OU-2 were identified. Two buildings hold the majority of the active sumps and tanks. WD Building has 18 and T Building has 14 active sumps and tanks. The remaining active sumps and tanks are located in nine OU-2 buildings (H, M, G, SD, 41, 58, 56, HH, and R). Information concerning the Ou-2 active sumps and tanks is presented Table V.1 and locations are shown in Figure 5.1.

The database review identified one tank (117) that is subject to BUSTR within OU-2. This tank passed a tank tightness test in April, 1994. Four additional OU-2 tanks are treated as BUSTR tanks and receive tank tightness tests. These tanks, 113, 114, 115, and 116 are located at the P Building. (Cloud 1994)

The OU-8 investigation determined that the T Building USTs are not considered to be potential release sources (DOE 1992c) because the sumps and tanks in T Building were formed in the concrete floor when the building was constructed. The floor and walls were constructed of 10 foot thick reinforced concrete which reduces the possibility of a release.

A visual inspection was performed on as many of these active sumps and tanks as possible. However, many sumps and tanks could not be visually inspected. Sumps were built into the floors of buildings and usually contained water which interfered with the inspection. Some sumps had unremovable lids or permanent piping that interfered with the removal of the lids. Tanks were usually underground and could not be visually inspected.

The visual inspection identified four tanks with visible staining/stressed vegetation. These tanks (113, 114, 115, and 116) located by P Building are USTs tanks containing fuel oil. They are treated as BUSTR tanks and receive annual tank tightness tests. Tightness tests performed in April, 1994 indicated that that the tanks were not leaking. These four tanks were removed in the spring of 1995. Stains and soil sampling results obtained after the tanks were removed indicate that spills during filling may have occurred.

OU-2 sump and tank inspection identified two tanks (28 and 29) that were previously reported as being in A Building. Their actual location is outside the south entrance to OSE Building. The investigation also identified two sumps (280, 281) not previously documented. Sump 280 is located outside P Building and collects boiler blow down water that is then pumped to the sanitary sewer system. Sump 281 is located in the WD Building in room 12. The function of this sump is not known.

An additional 13 sumps and tanks and two possible sumps were identified during a drawing review. These sumps and tanks were not visually inspected and therefore not assigned IDs. The number and location of these sumps and tanks are as follows: five sumps in P Building, one sump in A Building, one sump in C, six sumps in SW Building, and two possible sumps in R Building. Mound Plant's AUSTP is

responsible for assigning sumps and tanks to the appropriate regulatory and corresponding EG&G MAT program. The AUSTP should confirm the status of the sumps and tanks that were identified during the OU-2 investigation and assign them to the appropriate program.

To evaluate which, if any, active sumps and tanks warrant additional investigation, a ranking system was developed based on the information that existed for each sump and tank. Each active sump and tank was ranked in 5 different categories based on EPA requirements for new underground storage tanks (40 CFR Parts 280 and 281). The ranking categories included the tank material type, tank cathodic protection, spill overflow protection, tank release detection, and piping release detection. In each category, the choices were ranked based on their compliance with EPA requirements (40 CFR Parts 280 and 281).

Tanks that received tank tightness testing under BUSTR were eliminated from the ranking system as well as sumps and tanks in T Building, and any new sump or tank that was discovered during the OU-2 field investigation. T Building tanks were eliminated because they have been eliminated as potential release sources. Tanks and sumps that were discovered during the OU-2 field investigation were eliminated because information on these sumps and tanks was incomplete. In all, 29 sumps and tanks were included in the ranking system. The categorical choices are shown in Table V.2, along with what score each sump or tank received in each category.

Total possible score was 30 which is the sum of the highest category rank times the appropriate category weighting factor. If a tank met all of the EPA requirements for new underground storage tanks, the total possible score was 30 points. If a tank scored at least 20 points (66 %), the integrity of the tank was considered acceptable. If the tank scored 20 points, the tank had to be either constructed of EPA required material for new tanks or had a tank release detection system. Out of the 29 sumps and tanks ranked, 9 were rated as having acceptable integrity. The questionable sumps were 11, 12, 17, 18, 24, 134, 135, 258, and 268. Questionable tanks include 7, 8, 9, 10, 13, 14, 15, 16, 19, 119, and 120. To confirm the integrity of the sumps and tanks that were ranked as having questionable integrity, additional investigations that may include hydrostatic, volumetric, or pressure testing should be performed.

6.4.2. Inactive Sumps and Tanks

The OU-2 sump and tank database (Appendix F) was reviewed to identify the inactive sumps and tanks. This review identified 33 inactive sumps and tanks located within OU-2. Inactive sumps and tanks include tanks that have been removed, closed-in-place, or not-in-service. Information concerning the OU-2 inactive sumps and tanks was presented in Table V.4. Locations of the inactive sumps and tanks located within OU-2 are shown in Figure 5.3.

From the inactive sumps and tanks, the removed tanks were identified. Removed sumps and tanks have been physically removed by means of excavation or demolition. There were seven sumps and tanks (202, 203, 204, 208, 209, 222, and 223) in OU-2 that fall under this category. Five removed tank locations (202, 203, 204, 222, and 223) are assigned to the ER program under the OU-2 RI/FS. Two sump and tank locations are assigned to the D&D program.

When a sump or tank had been removed from service, the results of the D&D activities or other Mound Plant programs were to be assessed to determine that the verification sampling performed meets the DQOs established in the RI or to the standards specified in the USEPA guidance document "Methods for Evaluating Attainment of Cleanup Standards, Volume 1, Soils and Solid Media. 1989". Additional investigation could be warranted if the verification sampling was found not to conform to the these criteria.

Verification sampling and closure documentation does not exist for the seven removed sumps and tanks (202, 203, 204, 208, 209, 222, and 223) within OU-2. Five of these tanks (202, 203, 204, 222, and 223) are assigned to the ER program under OU-2. These five sumps and tanks have been given a level I category under the OU-2 RI/FS. The level I category includes all OU-2 areas that are not sufficiently addressed in any other Operable Unit and which require further investigation and sampling. These tank locations are discussed in the OU-2 RI/FS WP and will be addressed in the OU-2 Phase I Reconnaissance Report. The two removed tanks (208, 209) are currently assigned to the D&D program and will be verified under OU-6.

One tank (262) was identified during the Dames & Moore (1994) investigation by means of a drawing review. This tank was used to store waste oil from G Building. The tank was installed when G Building was constructed and appears to be located under GW Building. No information was found indicating whether the tank was removed or if verification sampling was performed. The Dames & Moore (1994) report proposed that tank 262 be assigned to the D&D program. Based on the substance stored in the tank and lack of information regarding the tank, it is recommended that this tank be assigned to the ER program for further investigation. This tank will be addressed in the OU-2 Phase I Reconnaissance Summary Report.

6.4.3. Aboveground Storage Tanks

Visual inspection was performed on the ASTs located within OU-2. This inspection was to evaluate if the tanks had the potential for a release, and was performed on August 25, 1994. This inspection was consistent with the visual inspection performed on the active sumps and tanks discussed in Section 5.3.1.2.

Twenty ASTs were identified during the field investigation. Locations of these ASTs were presented in Figure 5.4. Information obtained during the visual inspection was presented Table V.5. The majority of the tanks were process gas tanks, including seven liquid nitrogen tanks, one argon, and one propane tank. Four ERS tanks were identified in the inspection. The ERS tanks store water containing tritium. Two diesel fuel storage tanks and two chemical storage tanks were also identified during the visual inspection.

Visual inspection identified areas near two ASTs that warrant additional investigation. The first area is near AST-11, which supplies generator #4 with diesel fuel. Generator #4 is housed in a metal shed on a concrete pad to the east of PS Building. There is visible staining on the pad outside the shed. It appears that the staining originates from inside the metal shed and could be the result of leaking supply lines or from the generator itself.

The second area is near AST-17. The bottom appeared to have rusted from the sides of the tank, resulting in the release of the contents to the secondary containment. A yellowish liquid was visible in the secondary containment. There was also a small amount of staining near the drain valve of the secondary containment. The AST contents could not be identified at the time of the investigation, however, the area around the AST was roped off and marked caustic. These two ASTs will be addressed in the OU-2 Phase I Reconnaissance Summary Report.

SECTION 7

7. REFERENCES

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APPENDIX A

APPENDIX A

SEWER VIDEO INSPECTION FORMS

Sanitary Sewers	Pages A-2 through A-31
Storm Sewers	Pages A-32 through A-102

ICF KAISER ENGINEERS

Sewer Video Inspection Form

Date: ~~7/20/94~~ 7/21/94 **Time:** 8:20 a.m.
Contractor: Advanced Companies **Operator:** Arnie Huber

Video Camera Manufacturer: Aris
Video Camera Model #, Serial #: EE1000B SN 037

S. BAXTER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PV 4924 SN A9511021

Tape #: 1
Begining Tape Count: 00000
Ending Tape Count: 0675

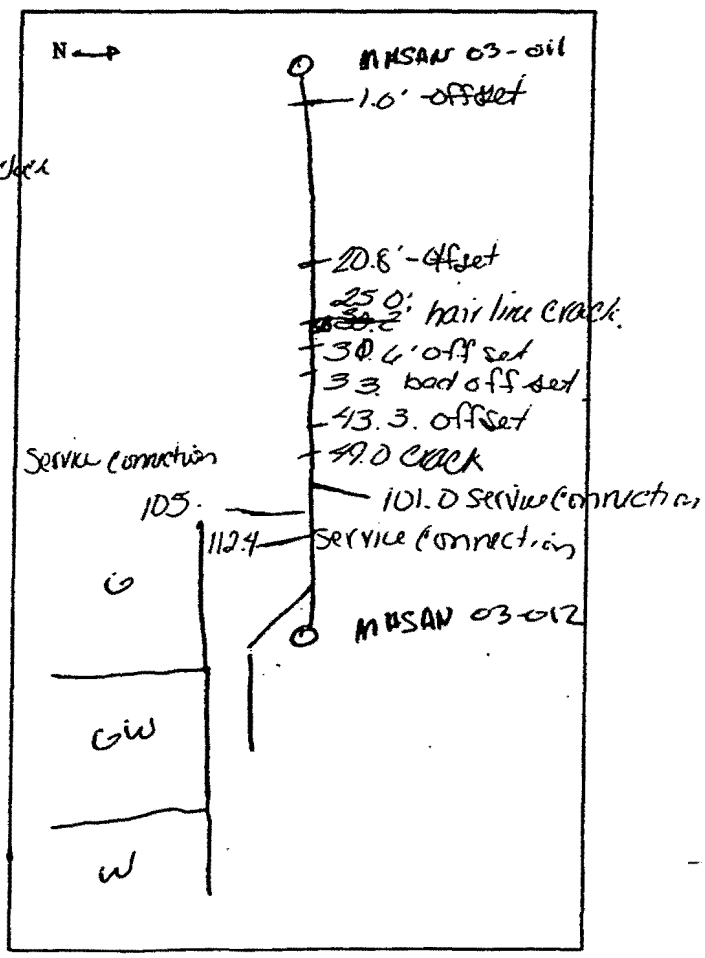
Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: 0.5 oil	NA,				
MH #2: MH 5411 03 012	118	0ppm	20% LEL	NA	
MH #3:					
MH #4:					
MH #5:					
MH #6:					
MH #7:					

NOTES Total 118.'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

1.0 ft. offset
20.8' offset
25.0 ~~30.2~~ hair line crack 12 o'clock to 4 o'clock
31.6' off set joint
33.2 off set 10:00-4:00 (bad)
43.3 off set joint
49.3 crack
53.6 off set joint
66.0 offset joint
69.0 crack 1:00-3:00
77.4 crack 4:00
80.5 offset joint
84.8 crushed pipe (4ft section)
90.4 pipe missing
~~100~~.0 Service connection (to left)
105. Service connection (to right)
112.4 service connection (right)
115.7 off set joint.
Change in pipe
118 end of line

SKETCH



2

ICF KAISER ENGINEERS

Sewer Video Inspection Form

Date: 7/21/94 **Time:** 8:55 am
Contractor: Advanced **Operator:** Arnie Huber

S. BAXTER

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: EE1000B SN 037

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PV4924 SNA951102A

Tape #: Tape 1
Begining Tape Count: 0075
Ending Tape Count: 0848

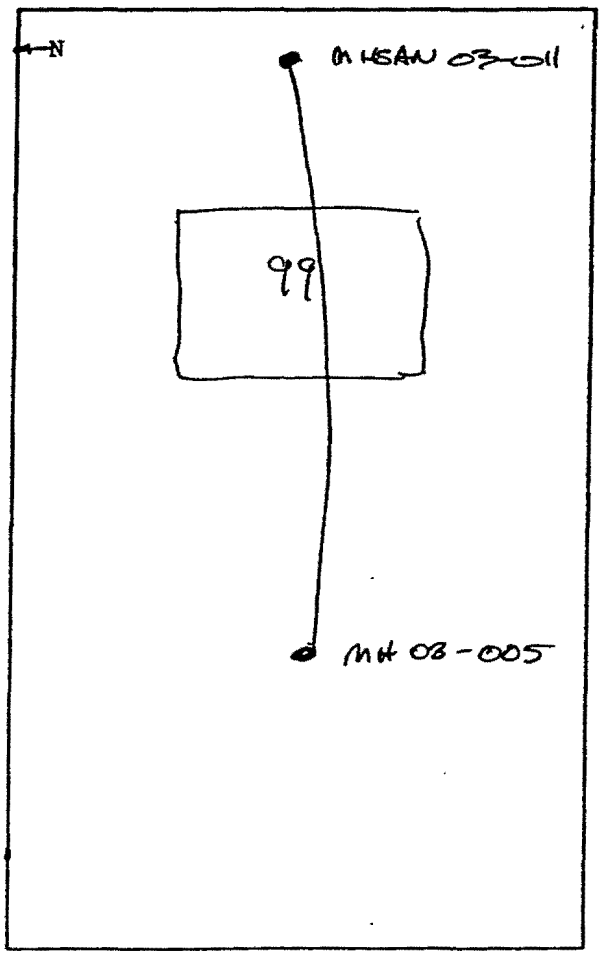
Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: MHSAN03011	NA	Open	2082	NA	
MH #2: MHSAN03005	78.4'		1210		
MH #3:					
MH #4:					
MH #5:					
MH #6:					
MH #7:					

NOTES total 78.4'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

8.3' offset joint
78.4' end of ~~pipe~~ SB pipe

SKETCH



ICF KAISER ENGINEERS

Sewer Video Inspection Form

Date: 7/21/94 **Time:** 9:20 am
Contractor: Advanced **Operator:** Arnie Hubel

S. BAXTER

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: EE1000B SN 037

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PU4924 SN9S1B021

Tape #: Tape 1
Begining Tape Count: 0848
Ending Tape Count: 111641

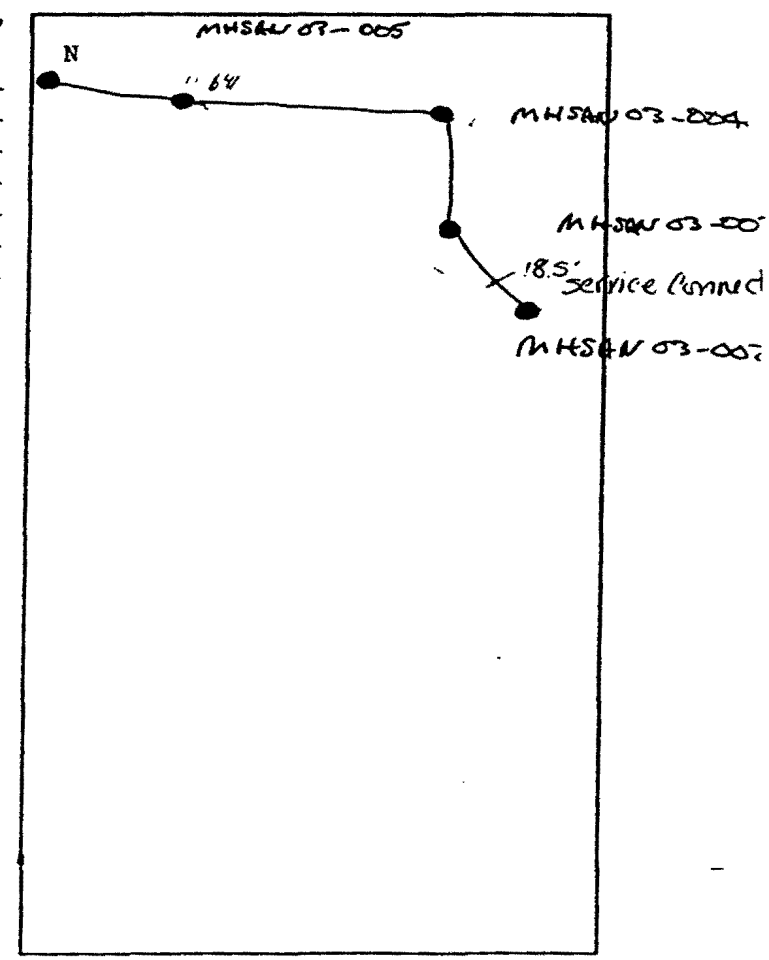
Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: MHSAN 03-002	NA				
MH #2: MHSAN03-003	23'			Hnu Opp.	02-20-82 LEL 0
MH #3: MHSAN 03-004	18'	to 03-003		Hnu Opp	0.2 20-88 LEL 0
MH #4: MHSAN 03-005	63'	from 03-004		Hnu Opp	02-20-89 LEL 0
MH #5:					
MH #6:					
MH #7:					

NOTES total 104'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

03-002 -
03-003 { 18.5' service connection to right
21.1 off set joint
20.0 off set
03-004 } 15.0 off set
03-003
03-004 } 5.0' off set joint
03-003 } 33.0 Belly in line (5ft.)
57.3 Belly in line

SKETCH



ICF KAISER ENGINEERS
Sewer Video Inspection Form

Date: 7/21/94 **Time:** 10:20am
Contractor: Advanced **Operator:** Arne Hubel

Video Camera Manufacturer: Ariks
Video Camera Model #, Serial #: EE1000B SN 037

S. BAKER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PV4924 SN A951021

Tape #: Tape 1
Begining Tape Count: 11641
Ending Tape Count: 1359

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: MHSAN 02-008	NA	Open	20%	NA	LEL 0
MH #2: MHSAN 02-007	53'	Open	20%	NA	LEL 0
MH #3: MHSAN 02-009	'	Open	20%	NA	LEL 0
MH #4:					
MH #5:					
MH #6:					
MH #7:					

NOTES total 53'

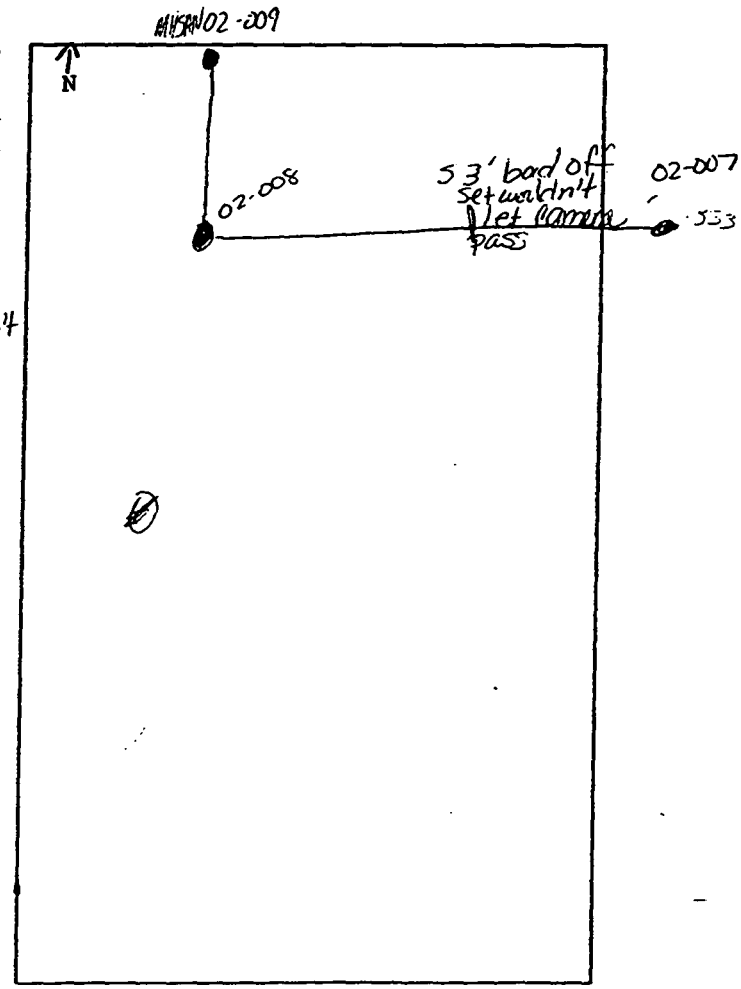
(Identify AOC, problem, footage, tape count, additional lines, etc.)

02-008 - 02007

29.0' separated joint
33.3' off set joint; possible crack 7:00-12:00
38.0' off set joint
44.5' off set joint
47.0' separated joint
53.0 off set joint (bad)
* 53.0 off set joint (bad) wouldn't allow camera to pass through

Didn't video MHSAN 02-009 there was a bend in the pipe

SKETCH



ICF KAISER ENGINEERS

Sewer Video Inspection Form

Date: 7/21/94 **Time:** 11:00
Contractor: Advanced Companies **Operator:** Arnie Hubley

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: EE1600 B SN 037

S. BAXTER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PV4904 SN A9511021

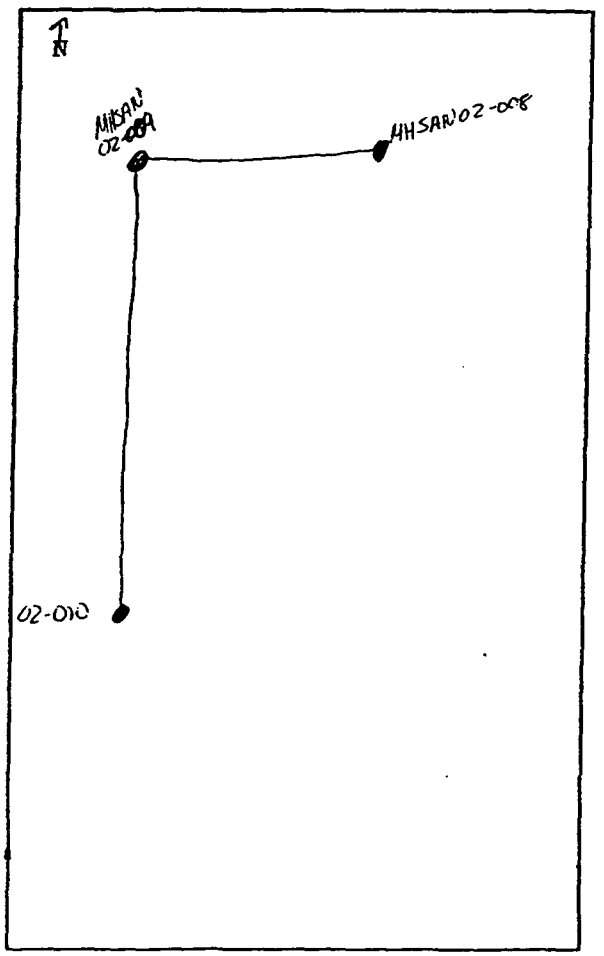
Tape #: Tape 1
Begining Tape Count: 1353
Ending Tape Count: 1502

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: MHSAN 02-009	NA	Open	20%	ND	LEC O
MH #2: MHSAN 02-010	SB 125'				
MH #3:					
MH #4:					
MH #5:					
MH #6:					
MH #7:					

NOTES total 125'

(Identify AOC, problem, footage, tape count, additional lines, etc.)
2.9 offset joint

SKETCH



ICF KAISER ENGINEERS
Sewer Video Inspection Form

Date: 7/21/94 **Time:** 1:15
Contractor: Advanced Companies **Operator:** Arnie Hubax

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: ~~EE~~1000B SN 037 S. BAKER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: DV4924 SN A95110211

Tape #: Tape 1
Begining Tape Count: 1502
Ending Tape Count: 3 ~~to~~ 5 2156

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: MHSAN 03 007	NA	.5ppm	20.8%	NA	LEL 0 - Drone - 2ppm
MH #2: 03 006	67'	.5ppm	20.8%	NA	LEL 0
MH #3: 03 005	37'				
MH #4: 03 009	~~5'~~ ~~LS~~	0ppm	20.8	NA	LEL 0
MH #5: 03 008	5 ~~111'~~ ~~LS~~				
MH #6: ~~02 011 SB~~					
MH #7: 02-011	109	0ppm	20.8%	NA	LEL 0

NOTES total 273'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

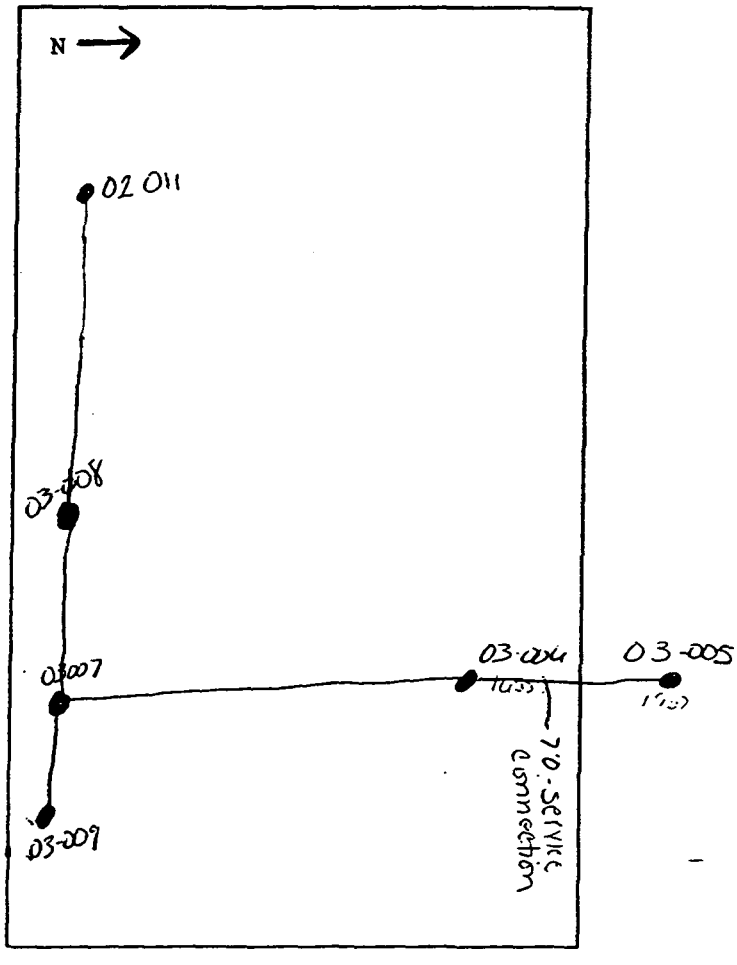
03 007 - 03 006
- Belly at Beginning of Line
- 0'-50'
- 10.0 another Belly
- 30.3 service Connection (right)
- 45.5' the 2nd Belly ended

03 006 - 03 005
- 7.0' Service Connection (right)
- 23.0' Belly (5ft.)

03-007 - 5' ft line - no problems

03 009 - 03007 - 03 008
- Off set joint 35'
- 48' possible leak in joint
- 58' off set in joint
- 76'80' off set joint
- 92.5' Ham Tap. service connection
- 112.0' possible crack pipe
- 114' large joint

SKETCH



ICF KAISER ENGINEERS

Sewer Video Inspection Form

Date: 7/21/94 **Time:** 2:10
Contractor: Advanced Companies **Operator:** Arnie Hubel

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: EE1000B SN 037 S BAKER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PV4924 SN A9S11021

Tape #: Tape 1
Begining Tape Count: SB ~~1502~~ 2156
Ending Tape Count: SB ~~2387~~ 2442

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: MHSAN 02 011	NA	open	20.8%	NA	LEL-0
MH #2: MHSAN 02 003	97'	Open	20.8	NA	LEL 0
MH #3: ~~MHSAN 02 002~~ SB					
MH #4:					
MH #5:					
MH #6:					
MH #7:					

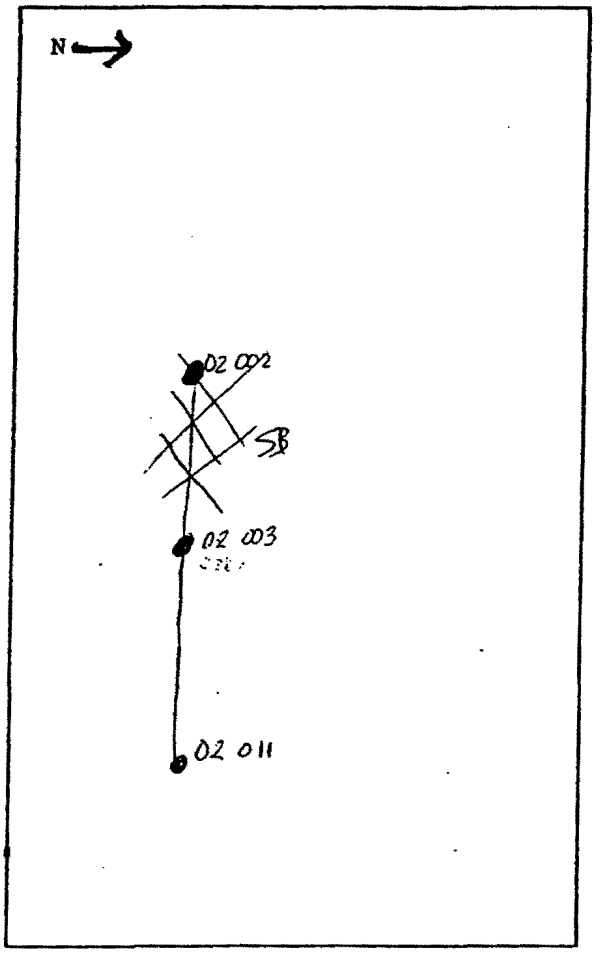
NOTES total 97'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

02-011-
02-003

2.0' off set joint
6' ~~8.28~~ crack 4.00
22.0' off set joint
62.0' crack 9:00
64.0' off set joint
70.0' possible crack 10:00
80.0' off set joint

SKETCH



ICF KAISER ENGINEERS
Sewer Video Inspection Form

Date: 7/21/94 **Time:** 3:00 pm
Contractor: Advanced Companies **Operator:** Arnie Hubel

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: EE 1000B SN - 037 S. BAXTER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PV 4924 SN A9511021

Tape #: Tape 1
Begining Tape Count: ~~2387~~ 2442
Ending Tape Count: 2769

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: MHSAN 02 001	NA				
MH #2: MHSAN 02 002	58'	1ppm	20.8%	NA	LELO
MH #3: MHSAN 02 003	20'	0ppm	20.8%	NA	LELO
MH #4:					
MH #5:					
MH #6:					
MH #7:					

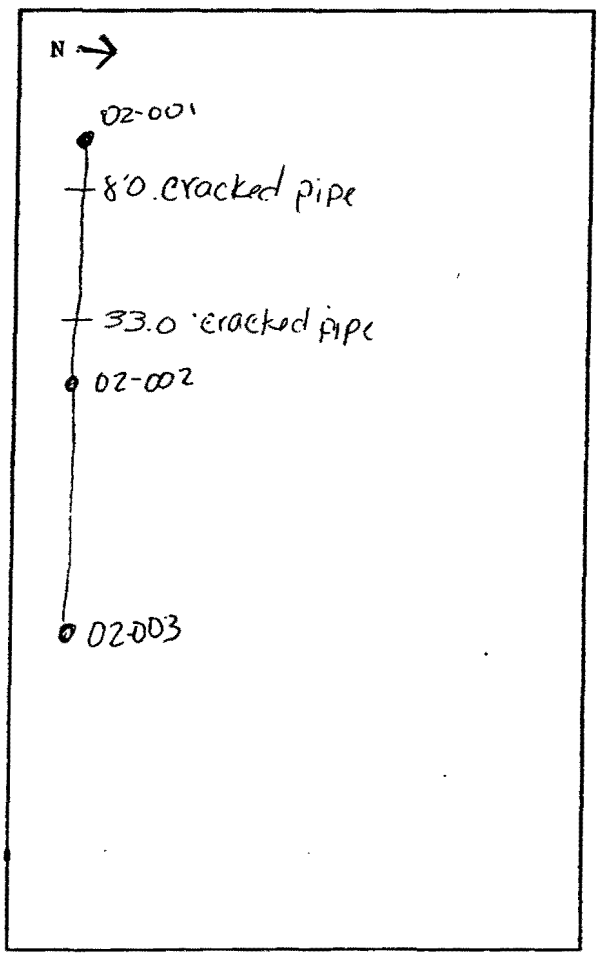
NOTES total 78'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

02-001 - 02-002
- 8.0' Cracked pipe 10:00-4:00
- 13.0' off set joint
- 15.0' Belly
- 26.0' off set in joint
- 33.0' Crack 2.0
- 40.0' off set joint
- 50.0' off set joint

02-002 - 02-003
- 60 off set joint
- 20 ft' to manhole 02-003

SKETCH



ICF KAISER ENGINEERS
Sewer Video Inspection Form

Date: 7/25/94 **Time:** 8:25 a.m.
Contractor: Advanced Companies **Operator:** Arnie Huber

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: EE1000B SN- 037

S. BAXTER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PV4924 SN A9511021

Tape #: Tape 2
Begining Tape Count:
Ending Tape Count:

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: MHSAN 02-014	NA	0ppm	20%	NA	LELO - BG 2.0 ppm
MH #2: MHSAN 02-010	0'	0ppm	20%	NA	LELO - BG 2.0 ppm
MH #3: MHSAN 02-011	0'				
MH #4:					
MH #5:					
MH #6:					
MH #7:					

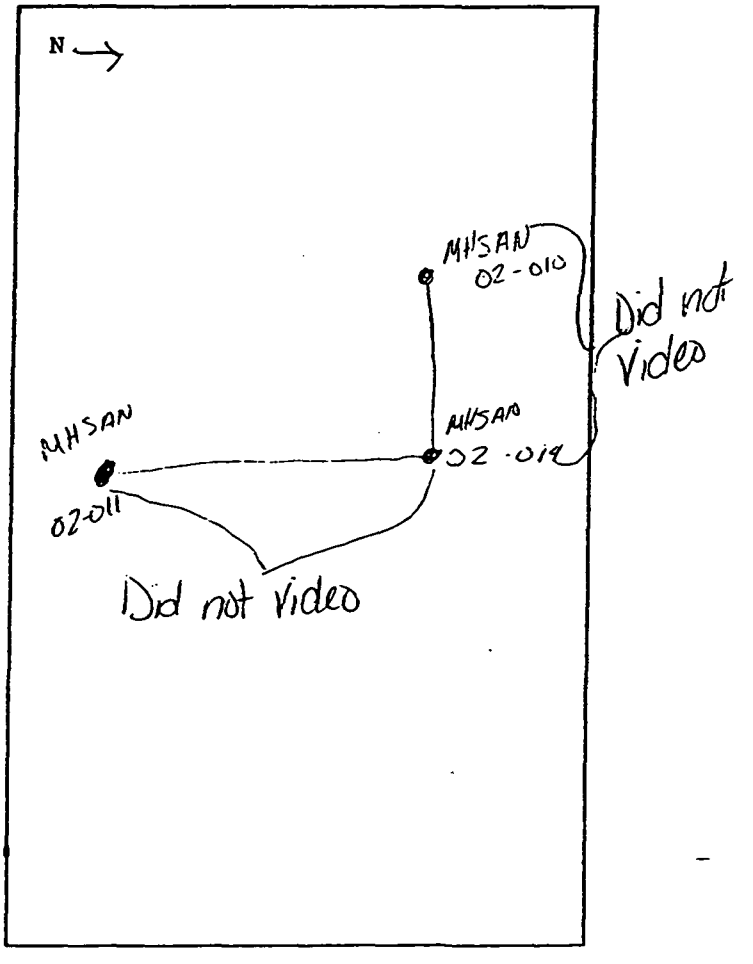
NOTES total 0'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

MHSAN 02-014 to MHSAN 02-010
Did not video because of tight invert.

MHSAN 02-014 to MHSAN 02-011
Did not video because of tight invert

SKETCH



10

ICF KAISER ENGINEERS

Sewer Video Inspection Form

Date: 7/25/95 **Time:** SB ~~8:40~~ 8:50 a.m.

Contractor: Advanced companies **Operator:** Arnie Huber

Video Camera Manufacturer: Aries

Video Camera Model #, Serial #: EE1000B SN-037 S. BAXTER

Manufacture of VCR: Panasonic

VCR Model #, Serial #: PV4924 SN A9511021

Tape #: Tape 2

Begining Tape Count: 0000

Ending Tape Count: 0353

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: MHSAN-02-001	NA	Open	2088	NA	L2C- D.Hole-Open
MH #2: MHSAN-01-004	25'	Open	2082	NA	-
MH #3:					
MH #4:					
MH #5:					
MH #6:					
MH #7:					

NOTES

(Identify AOC, problem, footage, tape count, additional lines, etc.)

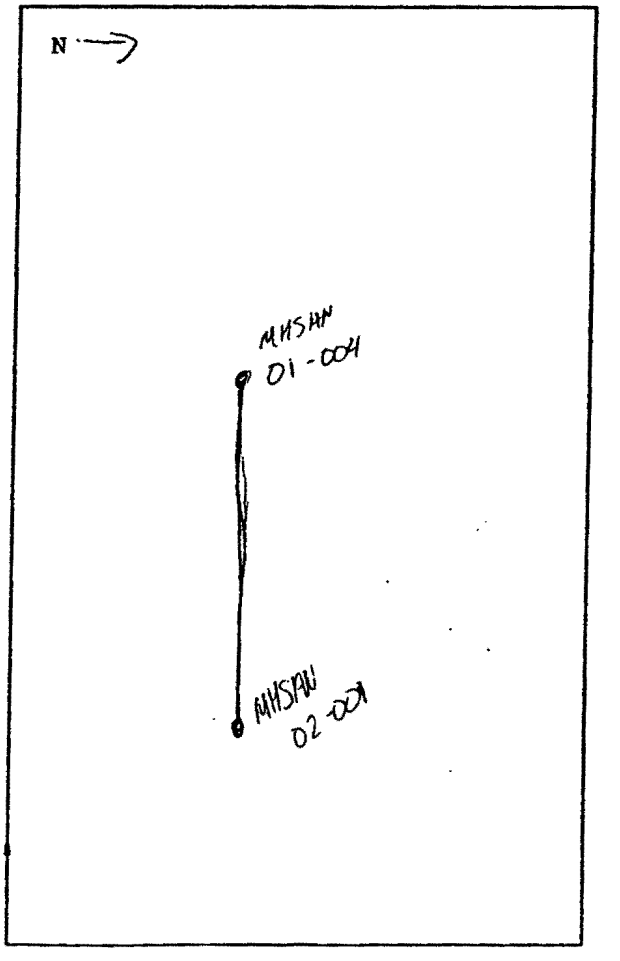
* line needed to be re cleaned will video after line is re jetted
* line was not reclaned what ever was sticking moved.

11.8' Possible leaking joint

Stopped videoing at 25.'0 It doesn't look like line had been cleaned.

Line Needs Be cleaned

SKETCH



ICF KAISER ENGINEERS

Sewer Video Inspection Form

Date: 7/25/94 **Time:** 9:30 am
Contractor: Advanced Companies **Operator:** Arnie Huber

Video Camera Manufacturer: Aris
Video Camera Model #, Serial #: EE 1000 B SN-037

S. BAXTER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PV4924 SN A9511021

Tape #: Tape 2
Begining Tape Count: 0353
Ending Tape Count: 0394

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: MHSAN 03010	NA	Off	2082	NA	
MH #2: ~~MHSAN 03009 BS~~	3'				~~Stopped at 45 crack, did not go~~
MH #3:					
MH #4:					
MH #5:					
MH #6:					
MH #7:					

~~Trader? NA~~ ~~N.I. AAH~~

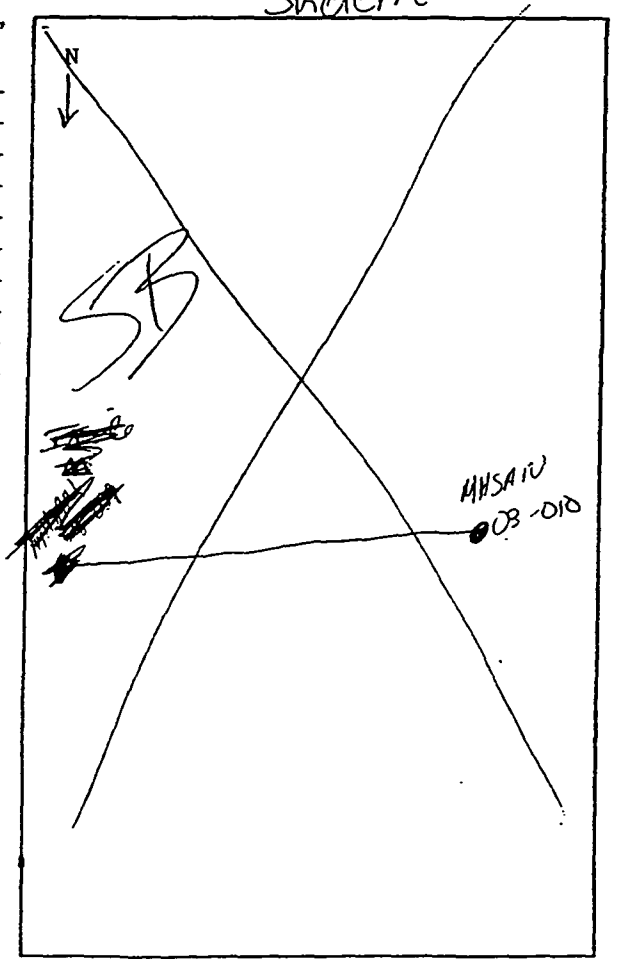
NOTES total 3.0'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

20' crack at 2:00
Bend about 30' in M.H. (45°)

SKETCH

Sketch on Back



ICF KAISER ENGINEERS
Sewer Video Inspection Form

Date: 7/25/94 **Time:** 10:00 am
Contractor: Advanced Companies **Operator:** Arnie Huber

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: EB1000B SN-037

S BAXTER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PV4934 SN A9511021

Tape #: Tape 2
Begining Tape Count: 0394
Ending Tape Count: 0731

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: MHSAN 03.009	NA	Opn	2082	NA	LECO —
MH #2: ~~MHSAN 03-010~~ SB	121.0'				
MH #3:					
MH #4:					
MH #5:					
MH #6:					
MH #7:					

Inside M

NOTES total 121.0'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

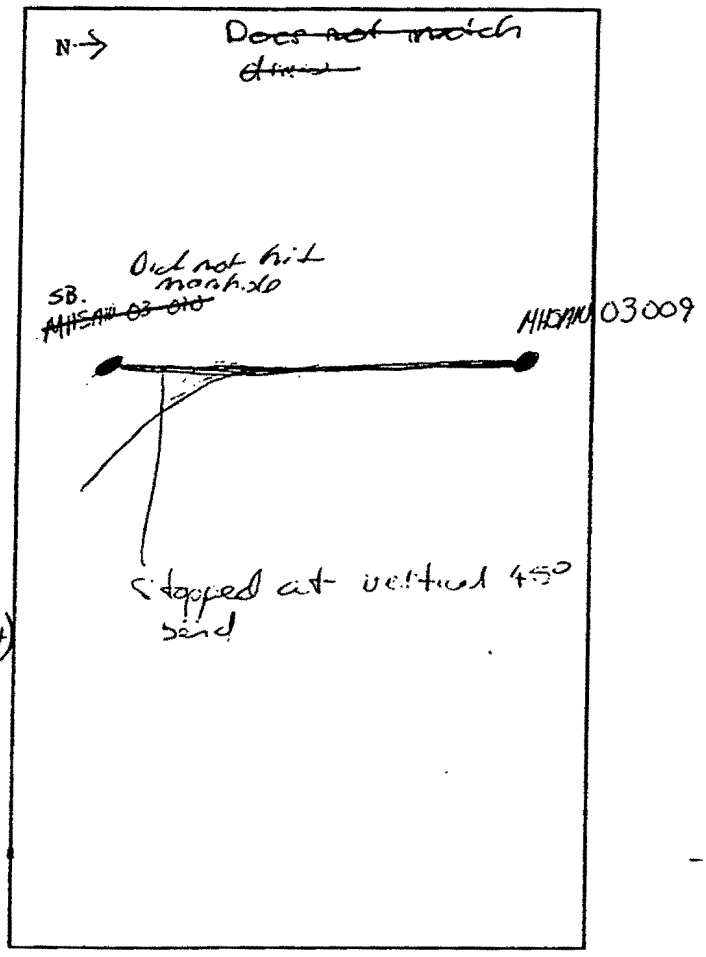
* line is suspoedly abandoned but there is flowing water in the southward direction

6.0' off set joint
12.0' off set joint
pipe changed at about 20.0' appears to be cast iron.

52.0' service connection at top of pipe
118.0' service connection to the right.
120.0' service connection straight ahead.

* line is not abandoned there is water flow coming from the bend in the pipe (to the right)

SKETCH



ICF KAISER ENGINEERS
Sewer Video Inspection Form

Date: 7/25/94 **Time:** 10:45 am
Contractor: Advanced Companies **Operator:** Arnie Huber

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: EE1000B SN 037 S. Baxter

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PV 4924 SN A951102

Tape #: Tape 2
Begining Tape Count: 0731
Ending Tape Count: 1146

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: MHSAN 03-014	NA	0 ppm	2082	NA	LEL 0 D hole 0
MH #2: ~~MHSAN 04-007B~~	–				
MH #3: ~~MHSAN 08-003B~~	–				
MH #4: MHSAN08-003	58'	0 ppm	2082	NA	LEL 0
MH #5: MHSAN 04-007	182'	0 ppm	2082	NA	LEL 0 Dhole 0
MH #6:					
MH #7:					

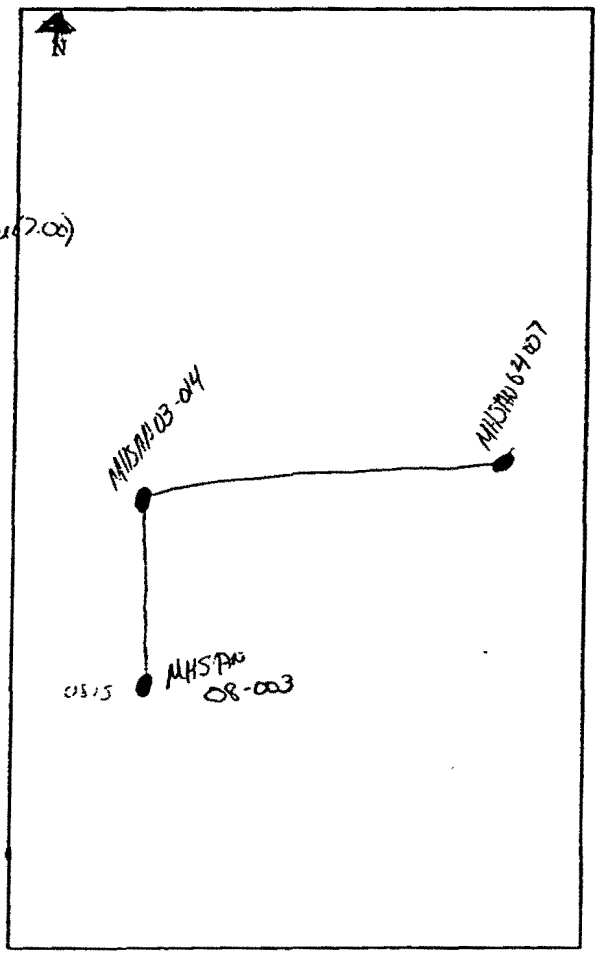
NOTES total 240'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

MHSAN 03-014 08-003 { 36.0' change in pipe from steel to clay.

62' crack at top of pipe 10:00-12:00
67' circular crack
23' possible hole in side of pipe (7:00)
161.0' crack in pipe
180.0' drop in pipe

SKETCH



ICF KAISER ENGINEERS
Sewer Video Inspection Form

Date: 7/25/94 **Time:** 12:45pm
Contractor: Advanced Companies **Operator:** Arnie Huber

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: EE1000B SN-037 S. BARTER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PV4924 SN A9511021

Tape #: Tape 2
Begining Tape Count: 1146
Ending Tape Count: 1780

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: MHSAN 04-002	NA	0ppm	20.8%	NA	CLEO
MH #2: MHSAN 04-001	95.0'	0ppm	20.8%	NA	CLEO Dhole-0
MH #3: MHSAN 04-006	312.0'	0ppm	20.8%	NA	
MH #4:					
MH #5:					
MH #6:					
MH #7:					

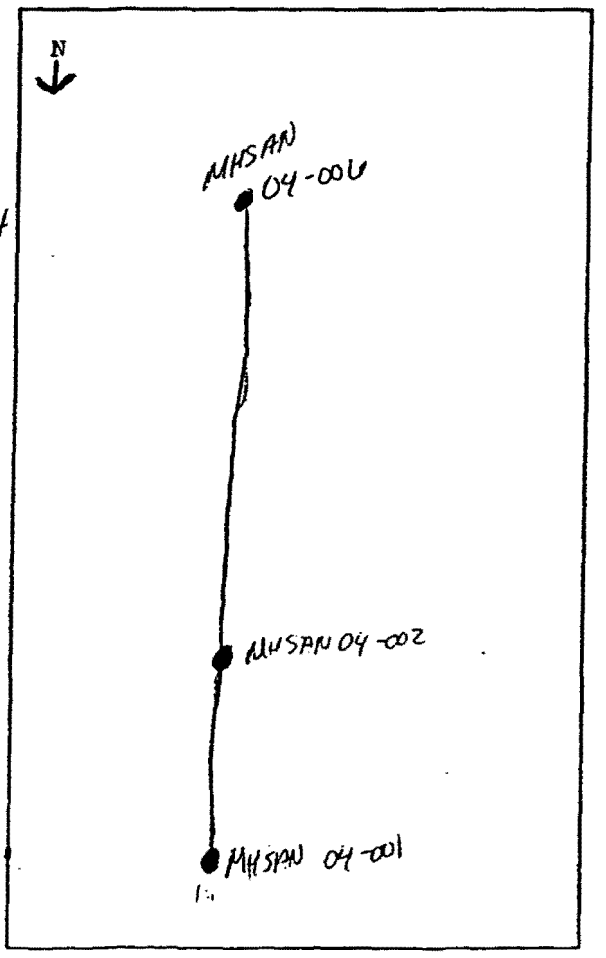
NOTES total: 407.0

(Identify AOC, problem, footage, tape count, additional lines, etc.)

04-002 04-001 { lots of spider webs in line. the line was in fairly good condition there seemed to be no problems.

04-002 04-006 { 74.0' service connection to the right this line was in good condition

SKETCH



ICF KAISER ENGINEERS

Sewer Video Inspection Form

Date: 7/25/91 **Time:**
Contractor: Advanced Companies **Operator:** Arnie Huber

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: EE1000B SN-037 S. BAKER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PV4924 SN A9511021

Tape #: Tape 2
Begining Tape Count: 1780
Ending Tape Count: 1820

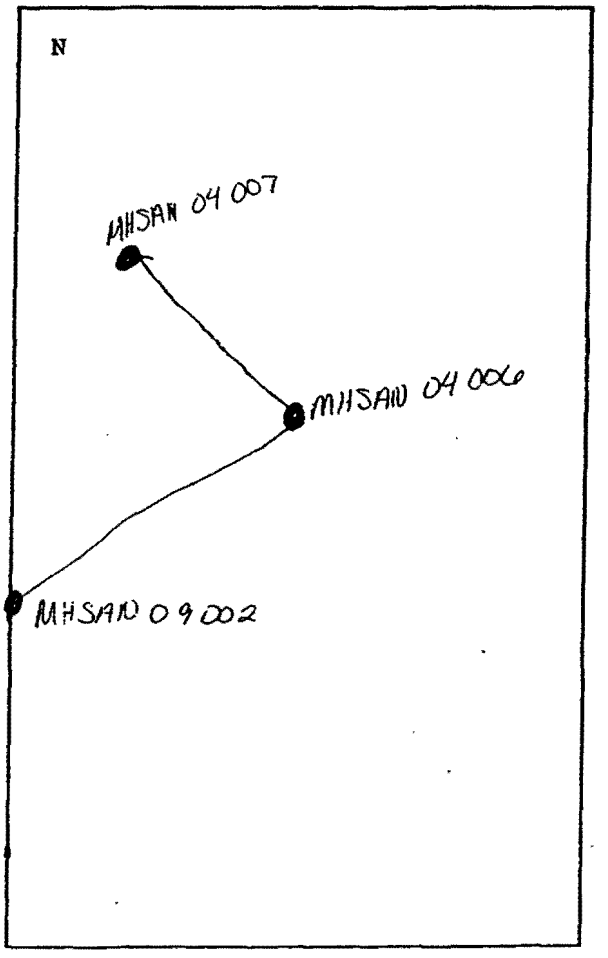
Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1:	NA				
MH #2:					
MH #3:					
MH #4:					
MH #5:					
MH #6:					
MH #7:					

NOTES

(Identify AOC, problem, footage, tape count, additional lines, etc.)

Nozzle on vac truck got stuck. did not video this section

SKETCH



ICF KAISER ENGINEERS

Sewer Video Inspection Form

Date: ~~7/25/94~~ SB 7/28/94 **Time:** 8:10 am.
Contractor: Advanced Complaives **Operator:** Arnie Huber

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: EE 1000B SN-037 S. BAXTER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PV4924 SN A951102L

Tape #: Tape 2
Begining Tape Count: 1820
Ending Tape Count: 1907

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: MHSAN 04006	NA				
MH #2: 04007	57'	0ppm	2082	NA	LEL-0 Dtble Ohm
MH #3: 09002	0'				
MH #4:					
MH #5:					
MH #6:					
MH #7:					

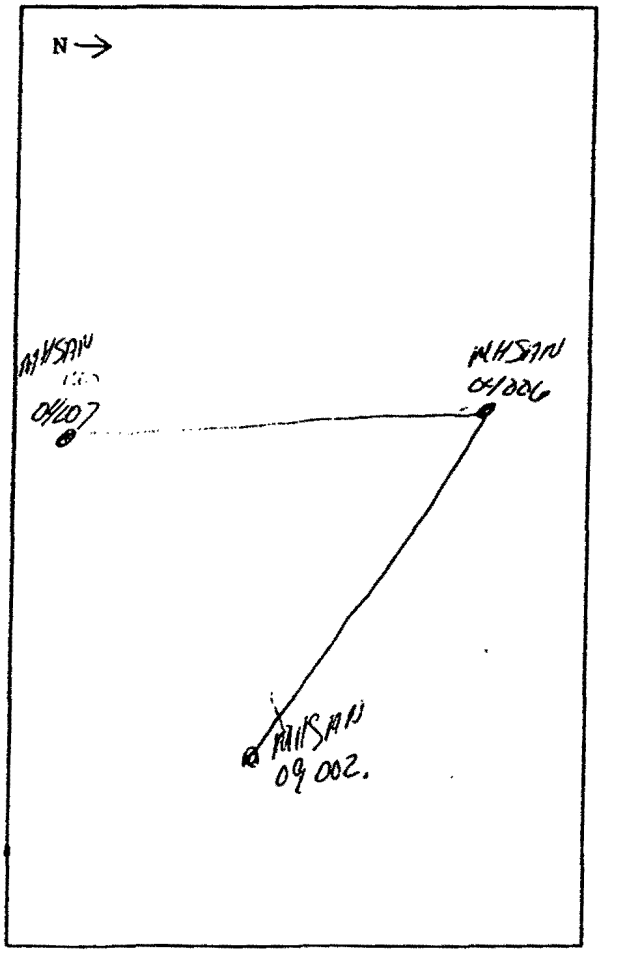
NOTES total 57'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

MHSAN 4006-04007 piece of debris in front of camera. getting pushed through the line. pipe was in fairly good condition

Did not video line MHSAN 04006 to MHSAN 09002. This line had not been cleaned out.

SKETCH



ICF KAISER ENGINEERS
Sewer Video Inspection Form

Date: 7/28/94 **Time:** 9:30 a.m.
Contractor: Advanced Companies **Operator:** Arnie Huber

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: EE 1000B SN-037 SBATTER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PV4924 SN-A9511021

Tape #: Tape 1
Begining Tape Count: 1907
Ending Tape Count: 3501

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: MHSAN ~~01004~~ SB 01001	NA	2 SPA	208	NA	*this line was taped
MH #2: MHSAN 01004	237.5'		CEL-0		as 01001 but was actually
MH #3: MHSAN 01003	123.0'				MHSAN 01002.
MH #4: MHSAN ~~01004~~ 01002	25.0'	.8	208	NA	
MH #5:			CEL-0		
MH #6:					
MH #7:					*notes are continued on back of sheet.

NOTES total 385.5'

SKETCH

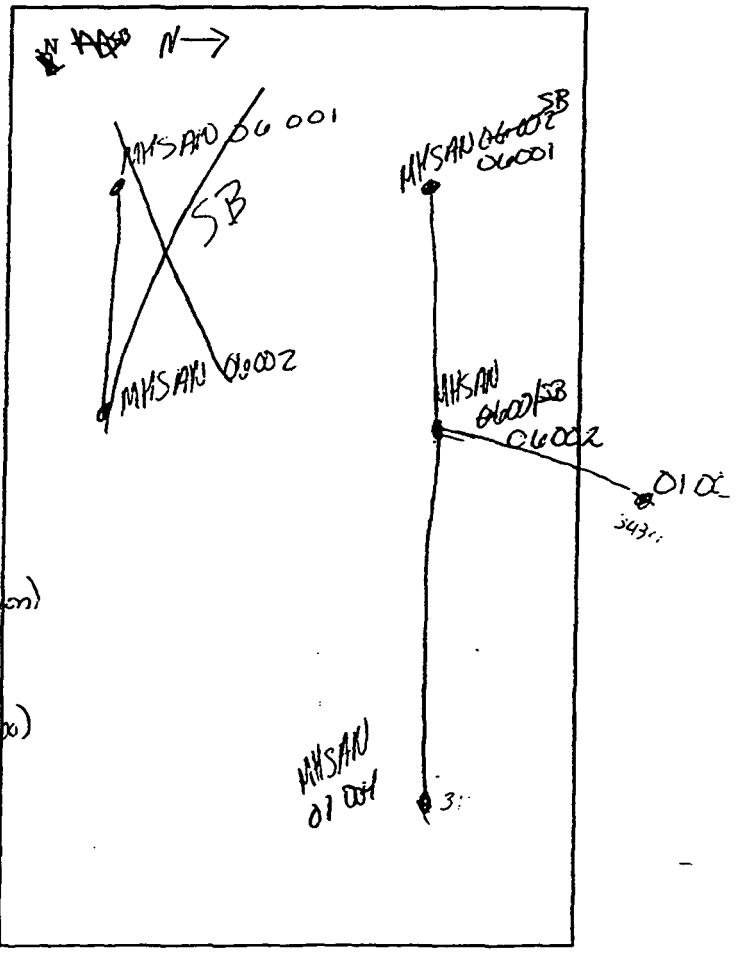
(Identify AOC, problem, footage, tape count, additional lines, etc.)

MHSAN 01001 SB to MHSAN 01004

4.0' Belly
28.0' out of belly
50.0' Another Belly
129.0' out of the belly
176.0' Came out of belly
177.0' Another Belly
206.0' Came out of Belly
214.0' possible crack pipe (2:00)
219.0' possible cracked pipe (1:00-5:00)
225.0' Another Belly
228.0' Completely Underwater
237.5' Could go no farther.

SB 01002 to MHSAN 01003

18.0' possible crack (11:00-8:00)
20.0' large hole in pipe (right side)
28.0' Service connection to the left.
40.0' possible crack (11:0-1:00)
49.0' possible surface cracks (full pipe section)
56.2' Service connection to the left.
60.0' off set joint; looks like sludge seeped through
68.0' off set joint. possible cracks (1:00, 2:00, 7:00)
71.0' possible crack (10:00)
72.0' service connection to the left
off set joint joining into lateral
84.0' service connection on top.
101.0' Service Connection to the left.
113.5' service connection on top.



ICF KAISER ENGINEERS

Sewer Video Inspection Form

Date: 7/28/94 **Time:** 12:30
Contractor: Advanced Companies **Operator:** Arnie Huber

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: EE1000B SN-037 S BARTER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: DU 4924 SN A9511021

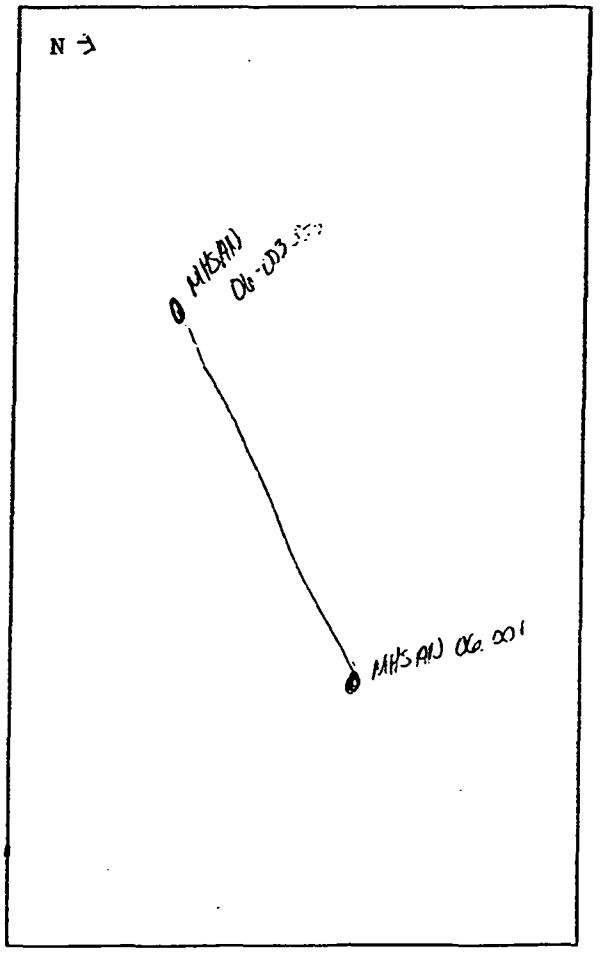
Tape #: Tape 2
Begining Tape Count: 3501
Ending Tape Count: 3571

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: D6 ~~001~~ 002 Jto	NA	82.8	20%	NA	2.5 ppm D-Hole
MH #2: D6 003	121.0'				
MH #3:					
MH #4:					
MH #5:					
MH #6:					
MH #7:					

NOTES total 121.0'

(Identify AOC, problem, footage, tape count, additional lines, etc.)
New pipe, in good condition

SKETCH



ICF KAISER ENGINEERS

Sewer Video Inspection Form

19

Date: 7/28/94 **Time:**
Contractor: Advanced Company **Operator:** Arnie Huber

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: EE1006B SN-037

Manufacture of VCR: Panasonic
VCR Model #, Serial #: DU4924 SN A9S11021

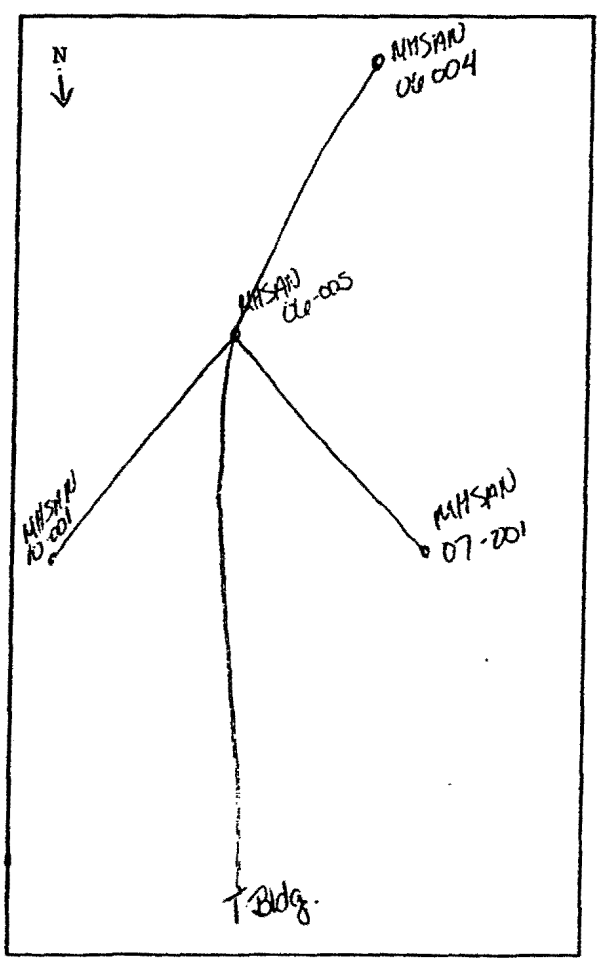
Tape #: Tape 2
Begining Tape Count:
Ending Tape Count:

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1:	NA	NA			*need confined space ~~with~~ because of the drops.
MH #2:					
MH #3:					
MH #4:					
MH #5:					
MH #6:					
MH #7:					

NOTES total 0'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

SKETCH



ICF KAISER ENGINEERS
Sewer Video Inspection Form

Date: 7/28/94 **Time:** 1:40 pm
Contractor: Advanced Company **Operator:** Arnie Huber

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: EE1000 B SN-037 S BARTER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PV4924 SN A9S11021

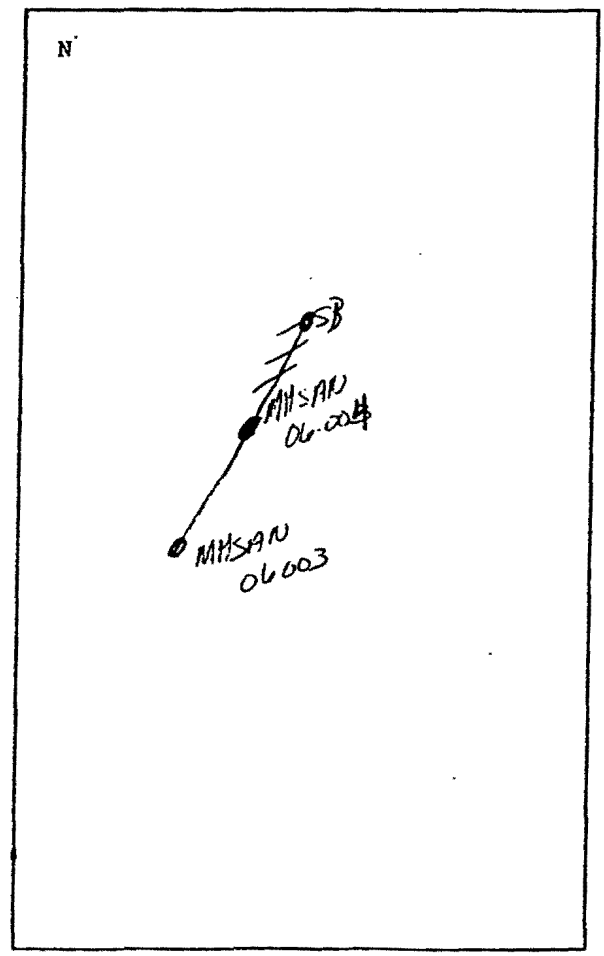
Tape #: Tape 2
Begining Tape Count: 3571
Ending Tape Count: ~~3 1405~~ 4976

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: MHSAN 06 004	NA	.8 ppm	20%		D Hole - 1.1 ppm
MH #2: MHSAN 06 003	19.3'				
MH #3:					
MH #4:					
MH #5:					
MH #6:					
MH #7:					

NOTES total 19.3'

(Identify AOC, problem, footage, tape count, additional lines, etc.)
liner in pipe (insitu-form)

SKETCH



ICF KAISER ENGINEERS
Sewer Video Inspection Form

Date: 7/28/94 **Time:** 1:50 pm
Contractor: Advanced Company **Operator:** Arnie Huber

Video Camera Manufacturer: Hills
Video Camera Model #, Serial #: EE1000B SN-037 S. BATTER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: DU4924 SN A951102

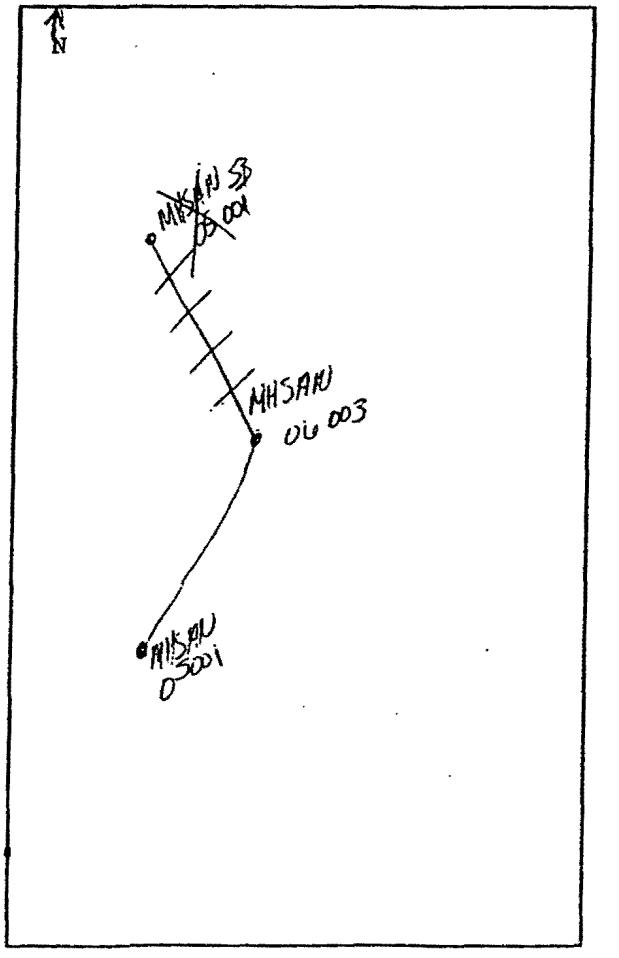
Tape #: Tape 2
Begining Tape Count: SB 1905 4976
Ending Tape Count: SB ~~1508~~ 5484

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: MHSAN 06 003	NA	0ppm	2088	LEL-0	
MH #2: MHSAN 05001	SB ~~139.8~~ 137.7'				
MH #3:					
MH #4:					
MH #5:					
MH #6:					
MH #7:					

NOTES total 137.7'

(Identify AOC, problem, footage, tape count, additional lines, etc.)
pipe has been lined

SKETCH



ICF KAISER ENGINEERS
Sewer Video Inspection Form

Date: 7/28/94 **Time:** 2:40pm
Contractor: Advanced Company **Operator:** Arnie Huber

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: EE1000B SN 037 S BAXTER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PVA924 SN A951104

Tape #: Tape 2
Begining Tape Count: SB ~~1504~~ 15484
Ending Tape Count: ~~SB 1592~~ SB 15576

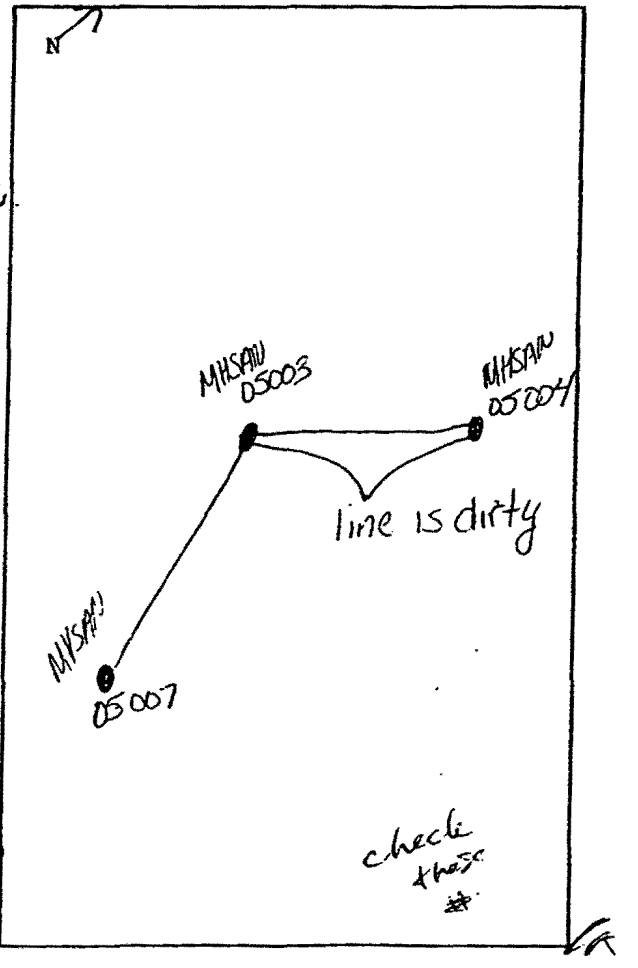
Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: ~~05006~~ SB 05003	NA	~~8ppm~~	20.8%	NA	Line 05003 to 05004 needs
MH #2: 05004	0'		LEL 0		to be cleaned.
MH #3: 05007	151.7'				
MH #4:					
MH #5:					
MH #6:					
MH #7:					

NOTES total 151.7'

(Identify AOC, problem, footage, tape count, additional lines, etc.)
Did not Video MHSAN 05003 to MHSAN 05004.

116.5' offset joint
150.7' end of pipe. Drop manhole.

SKETCH



ICF KAISER ENGINEERS

Sewer Video Inspection Form

Date: 7/28/99 **Time:** 3:05
Contractor: Advanced Companing **Operator:** Annie Huber

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: EE 1000B SN - 037 S.BAKER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PV4924 SN A9511021

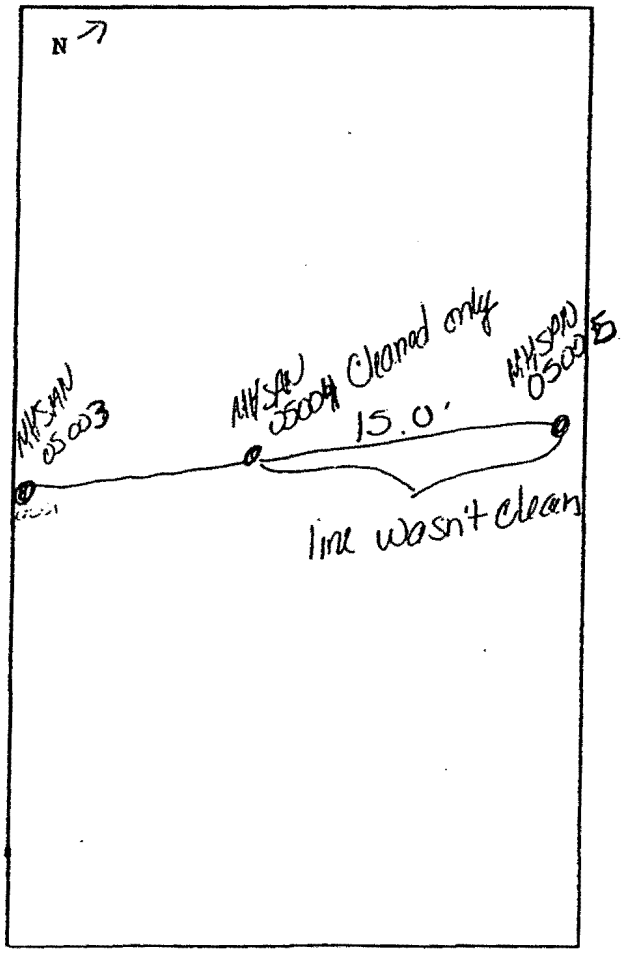
Tape #: Tape 2
Begining Tape Count: ~~SB 1592~~ 7076 8
Ending Tape Count: ~~SB 7151~~ 7331

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: 05 004	NA				MHSAN 05004 line to
MH #2: 05 003	56'	.8HA	20%	LEL 0	MHSAN 05005 was not
MH #3: 05 005	15'	.8HA	20%	LEL 0	Clean Only got 15.0'
MH #4:					
MH #5:					
MH #6:					¥ See page 26
MH #7:					

NOTES total 71.0'

(Identify AOC, problem, footage, tape count, additional lines, etc.)
Line WAS in good Condition

SKETCH



ICF KAISER ENGINEERS

Sewer Video Inspection Form

Date: 8/1/94 **Time:** 9:40
Contractor: Advanced Companies **Operator:** Arnie Huber

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: EE 1000B SN 037

SBATTER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PV 4924 SN A95/1021

Tape #: Tape 3
Begining Tape Count: 0002
Ending Tape Count: 0574

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: MHSAN 06 005	NA	Low	2082	ND	*Scale is 180.0 straight line
MH #2: ~~MHSAN 06 005~~ 10001	194.6'		1510		w/bends gives extra footage.
MH #3: MHSAN 07 001					
MH #4:					*Tried to do the line in T-Bldg.
MH #5:					but does a 45° turn right away.
MH #6:					
MH #7:					

NOTES total 194.6'

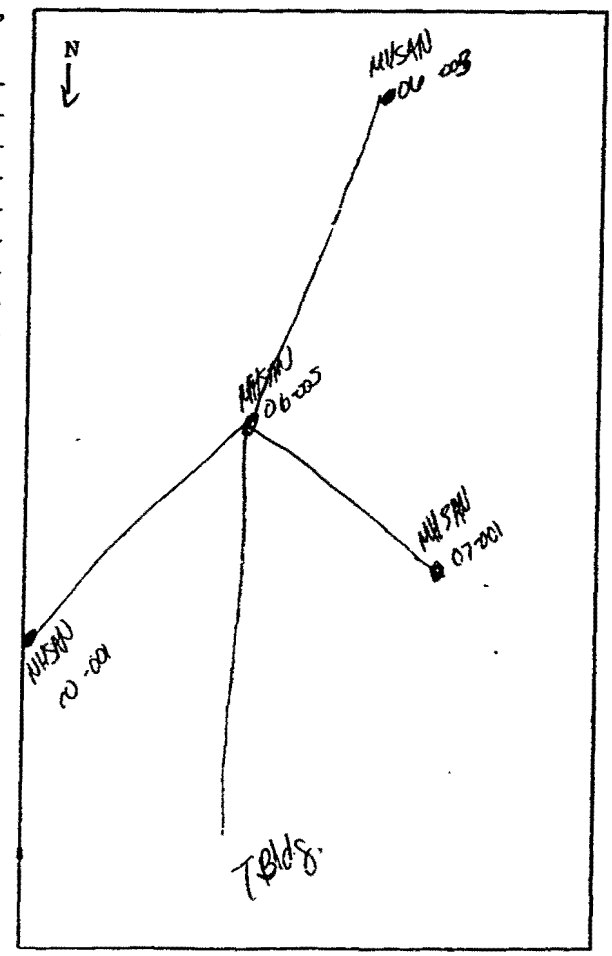
(Identify AOC, problem, footage, tape count, additional lines, etc.)

MH SAN 06 005 - 10.001
line is insituted
160.0' offset
170.0' offset
179.3' Belly in line

* line 06.005 to 07001 has a large offset right away

Can't go downhill either because of a 45° in the pipe

SKETCH



ICF KAISER ENGINEERS

Sewer Video Inspection Form

Date: 8/1/94 **Time:**
Contractor: Advanced Companies **Operator:** Arnie Huber

Video Camera Manufacturer: Aries Panasonic SB
Video Camera Model #, Serial #: EE1000B SU-037 S-BARTER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PV 4924 SMAS11021

Tape #: Tape 3
Begining Tape Count: 0574
Ending Tape Count:

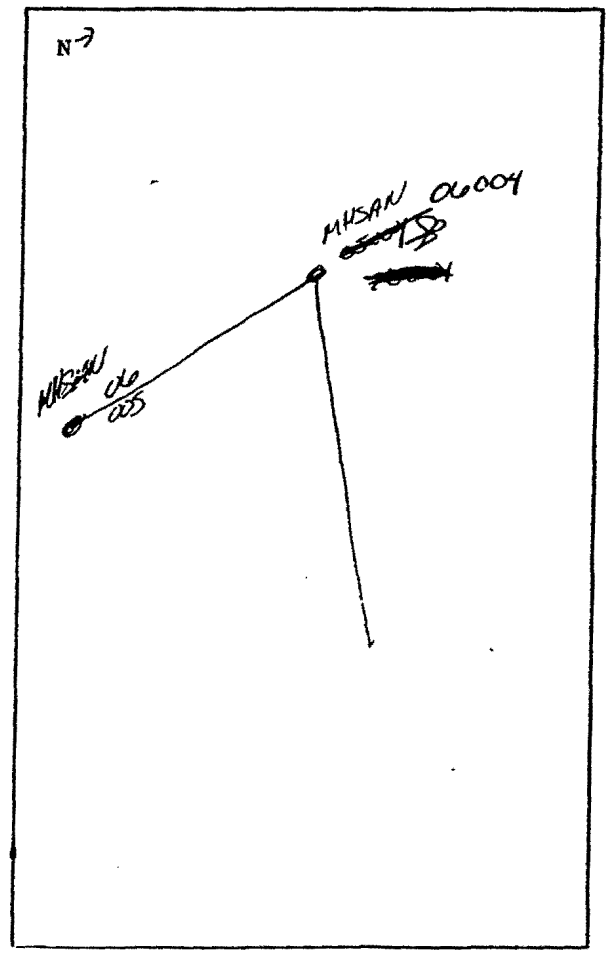
Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: MHSAN 05 004	NA	68pm	20%		CSC O
MH #2:					
MH #3:					
MH #4:					
MH #5:					
MH #6:					
MH #7:					

NOTES total O'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

Could not video 45'

SKETCH



ICF KAISER ENGINEERS

Sewer Video Inspection Form

Date: 8/1/94 **Time:** 12:10
Contractor: Advanced Companies **Operator:** Arnie Huber

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: EE 1000B SN-037

Manufacture of VCR: Panasonic
VCR Model #, Serial #: DV4924 SN A9511021

Tape #: Tape 3
Begining Tape Count: 0574
Ending Tape Count: 0697

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: MHSAN 05 004	NA				* 05 005 Doesn't appear
MH #2: MHSAN 05 100	65.0'	.6ppm	0.0%	NA	to be there. Could be
MH #3:			CLO		in the middle of D&D project.
MH #4:					
MH #5:					
MH #6:					
MH #7:					

NOTES total 65.0' 0.0%

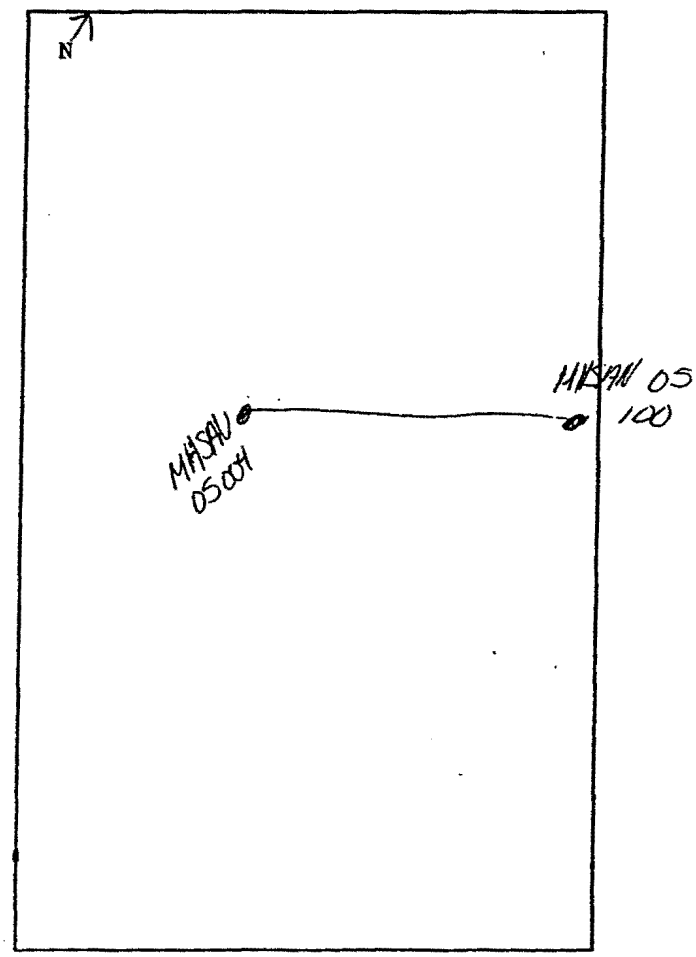
(Identify AOC, problem, footage, tape count, additional lines, etc.)

appears to be insitu lined
line continues off to the
left hand side.

got upto new manhole.

old line is filled with
concrete

SKETCH



ICF KAISER ENGINEERS
Sewer Video Inspection Form

Date: 8/1/94 **Time:** 1:00
Contractor: Advanced Companies **Operator:** Arnie Huber

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: EE1000B SN-837 S. BAXTER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: DU4942 SN A9511021

Tape #: Tape 3
Begining Tape Count: 0697
Ending Tape Count: 1021

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: MHSAN 01004	NA	.6 ppm	2086	NA	* Didn't get to MHSAN 02001
MH #2: MHSAN ~~02005~~	124.0		LEL 0		just a few feet of the MH
MH #3: ~~MHSAN 01005~~					
MH #4:					* Could not video from MH 01004
MH #5:					to B Bldg. debris in the
MH #6:					lines.
MH #7:					

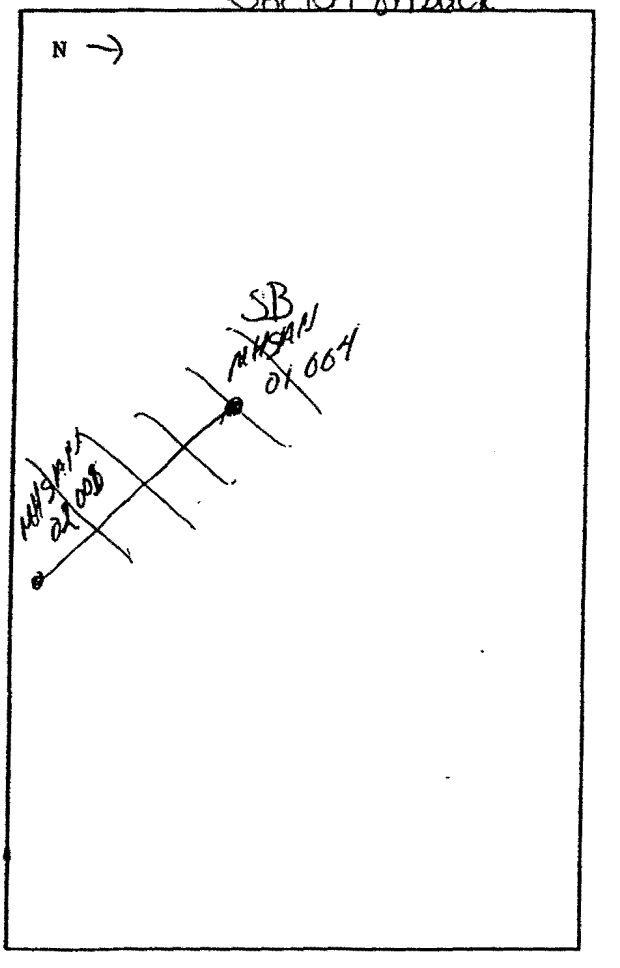
NOTES total 124.0'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

MHSAN 01004-02-001
- 0.0' Belly in Pipe
- 30.0' crack (10:00)
- 50.0' Came out of the Belly
- 106.0' service connection
- 68.0' Service Connection

SKETCH

sketch on back



ICF KAISER ENGINEERS

Sewer Video Inspection Form

Date: 8/11/94 **Time:** 2:10
Contractor: Advanced Companies **Operator:** Arnie Huber

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: EE1000B SN -037

S. BAXTER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PV4924 SN A9511021

Tape #: Tape 3
Begining Tape Count: ~~1012~~ 1021
Ending Tape Count: 1112

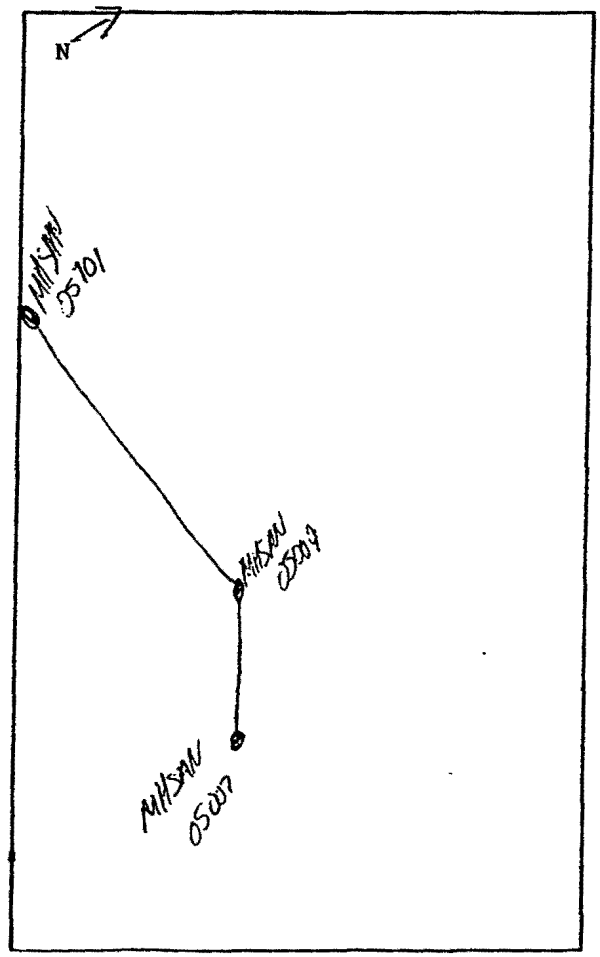
Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: MHSAN 05007	NA	.6ppm	2082	NA	* can't finish videoing
MH #2: MHSAN 05009	49.1'	—	LEL 0	—	the line full of debris
MH #3:					
MH #4:					Downhole - 1.5 ppm
MH #5:					
MH #6:					
MH #7:					

NOTES total 49.1'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

MHSAN 05007 to MHSAN05 009
insitued lined pipe
18.0' at sec. joint
47.0' Belly in line

SKETCH



ICF KAISER ENGINEERS

Sewer Video Inspection Form

Date: 8/1/94 **Time:** 2:35
Contractor: Advanced Companies **Operator:** Arnie Huber

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: EE1000B SN-037

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PU4924 SN A951/021

Tape #: Tape 3
Begining Tape Count: 1112
Ending Tape Count: 1254

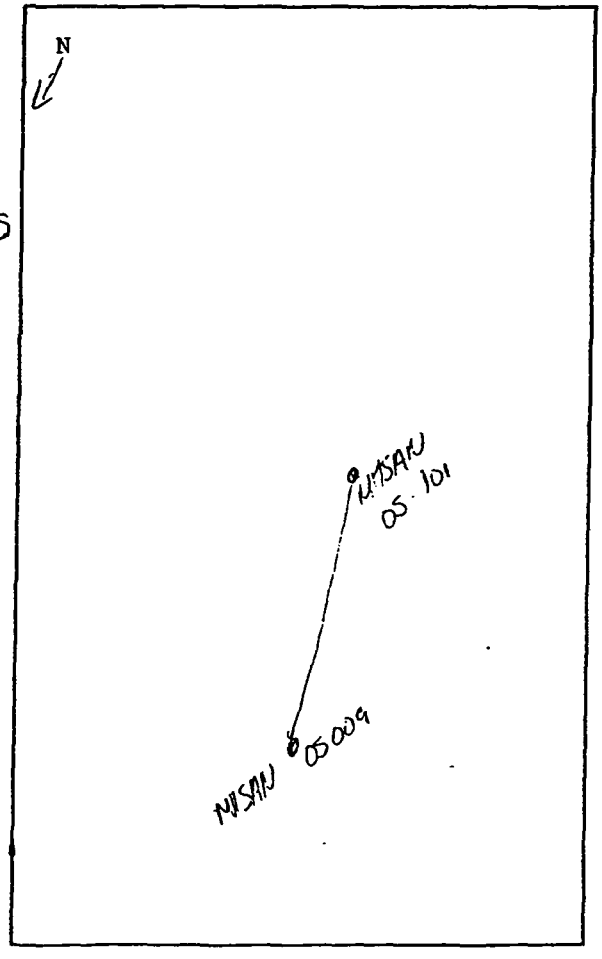
Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: MHSAN 05009	NA	.6ppm	2082	NA	LEL 0
MH #2: MHSAN 05101	158.0'				
MH #3:					
MH #4:					
MH #5:					
MH #6:					
MH #7:					

NOTES total

(Identify AOC, problem, footage, tape count, additional lines, etc.)

installed form line
9.0' off set joint
~~[illegible]~~ 157.0' Drop pipe
158.0' manhole
pipe was in good condition
there seemed to be no problems

SKETCH



ICF KAISER ENGINEERS

Sewer Video Inspection Form

Date: 8/1/94 **Time:** 3:00
Contractor: Advanced Companies **Operator:** Arnie Huber

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: EE1000B SN-037

S BAXTER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PU4924 SN A951102

Tape #: Tape 3
Begining Tape Count: 1254
Ending Tape Count: 15.34

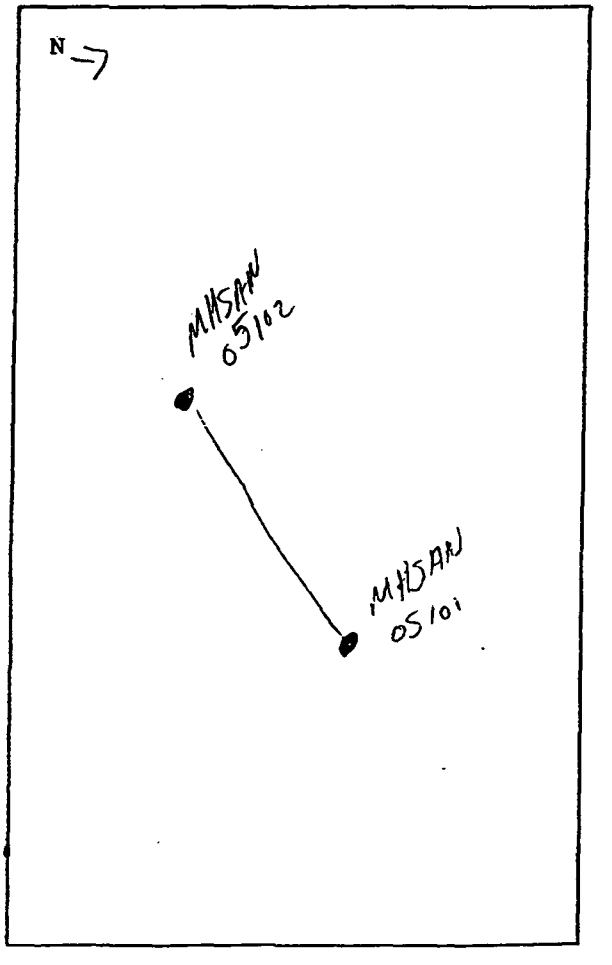
Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: MHSANOS101	NA	.8ppm	2088	NA	BG. 6ppm
MH #2: MHSANOS102	204.0'		LEL0		
MH #3:					
MH #4:					
MH #5:					
MH #6:					
MH #7:					

NOTES total - 204.0'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

24.0' leaky joint
38.0' cracked pipe.
65.0' off set joint
163.0' cracked pipe, Roots in pipe
204.0' board in line. A few feet from the manhole; Drop manhole.

SKETCH



ICF KAISER ENGINEERS

Sewer Video Inspection Form

Date: 8/2/94 **Time:** 8:00
Contractor: Advanced Companies **Operator:** Arnie Huber

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: EE1000B SN-037

S. BAXTER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: DU4924 SN-A9S11021

Tape #: Tape 4
Begining Tape Count: 0000
Ending Tape Count: 0553

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: MHSS 04004	NA	.8ppm	20%	NA	Dhole .8pp.
MH #2: SD 04003	58.0'		LEL 0		
MH #3: MHSS 04002	185.3'	.8ppm	20%	NA	Dhole 1.0ppm
MH #4: SD 03014	30.7'		LEL 0		
MH #5:					
MH #6:					
MH #7:					

NOTES total 74.8 274.0'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

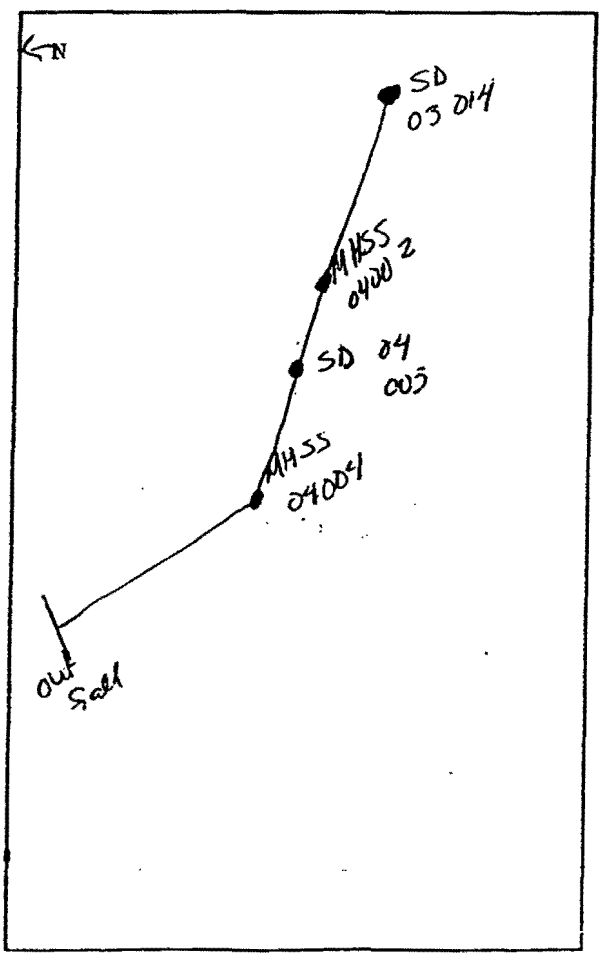
MHSS 04004 SD 04003
- 8.0' cracked pipe (1:00)
- 11.0' cracked pipe about 4' lengths (4:00, 12:00, 8:00, 6:00)
- 30.0' cracked pipe (12:00)
- 35.0' cracked pipe (11:00)
- 47.0' cracked pipe (11:00)

SD 04003 MHSS 04002
- 77.0' intrusion in pipe (12:00)

MHSS 04002 SD 03014
- 12.0 cracked pipe (3:00 to 6:00)
- 26.0 service connection (top)
- " cracked pipe

Gravel in line could go no farther than 30.7'

SKETCH



ICF KAISER ENGINEERS

Sewer Video Inspection Form

Date: 8/2/94 **Time:** 9:15
Contractor: Advanced Companies **Operator:** Annie Huber

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: EE1000B SN 037 S. BAKER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PV4924 SN A9511021

Tape #: Tape 4
Begining Tape Count: 0553
Ending Tape Count: 1051

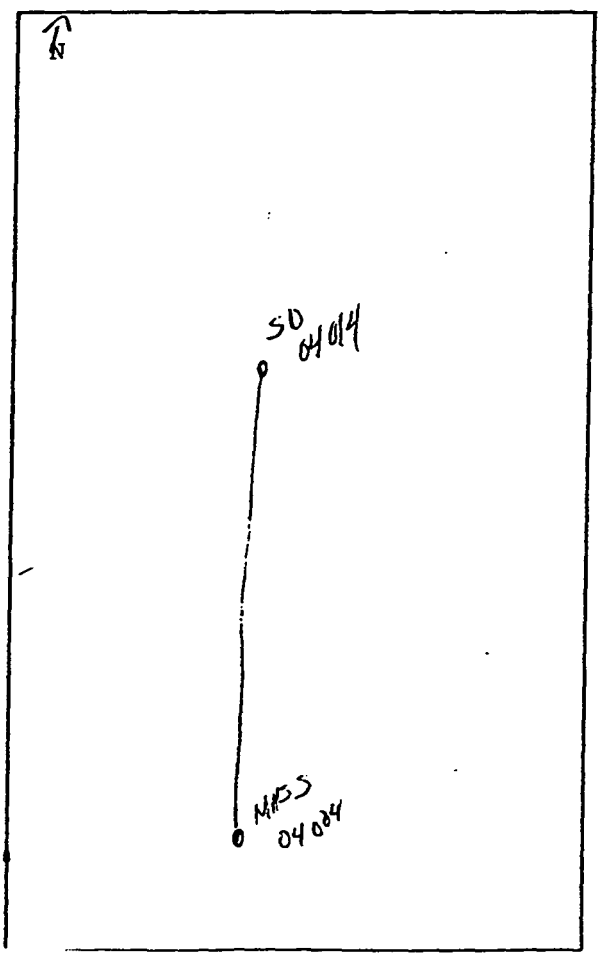
Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: MH550400 21	NA	.8ppm	2082	NA	* Didn't finish
MH #2: SD 04014	302.0'		1210		video line, SD lid
MH #3:					was welded shut
MH #4:					
MH #5:					
MH #6:					
MH #7:					

NOTES total 302.0'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

1.0' off set joint
7.0' crack in pipe [6:00]
27.0' crack has gotten larger
40.0' crack stopped
48.0' off set joint
53.0' cracked pipe
79.0' bad off set
92.0 cracks in entire pipe
96.0' very bad cracks in pipe
100.0' off set joint
120.0' bad off set joint
135.0' crack stopped
137.0' cracked pipe
145.0' bad off set joint
150.0' off set joint
155.0' off set joint
160.0' service connection to the left
170.0' possible leaking joint
207.0' bad off set
215.0' possible leaking joint
220.0 off set joint
240' crack stops
245.0 possible leaking joint
242.0 cracked pipe
280.0 off set joint
293.0 service connection
300.0' possible open joint
302.0 Stuck on off set joint

SKETCH



ICF KAISER ENGINEERS

Sewer Video Inspection Form

Date: 8/2/94 **Time:** 10:15
Contractor: Advanced Companies **Operator:** Arnie Huber

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: EE1000B SN-037 SBAXER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PV4924 SN A9S11021

Tape #: Tape 4
Begining Tape Count: 1051
Ending Tape Count: 1308

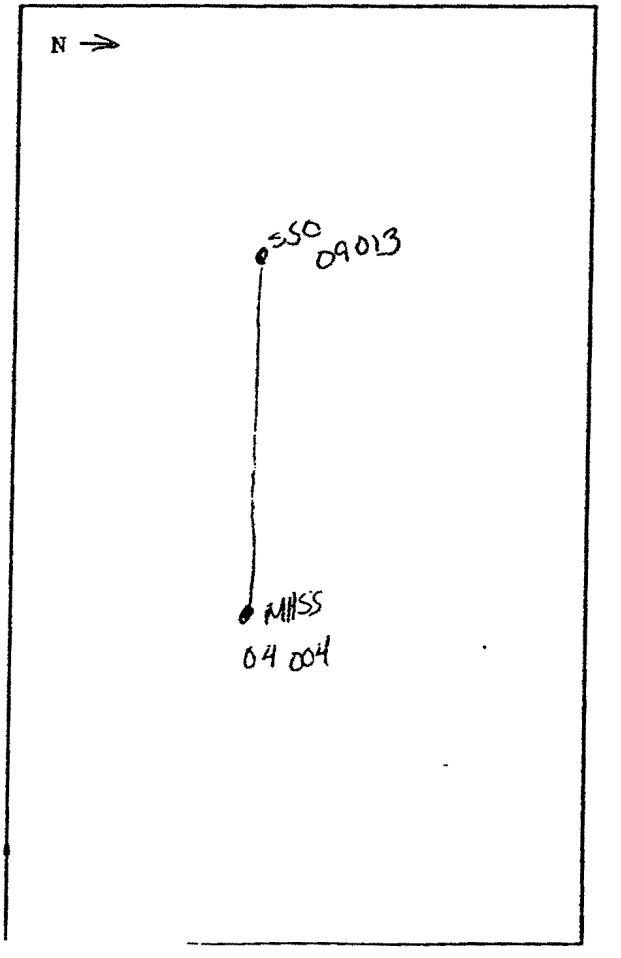
Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: MHSS 04004	NA	See	2082	NA	* Can't video any
MH #2: SS09013	188.0'		420		farther obstruction
MH #3:					in line.
MH #4:					
MH #5:					
MH #6:					
MH #7:					

NOTES total 188.0'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

16.0' off set joint
23.0' cracked pipe (11:00)
90.0' cracked pipe (12:00 to 1:00)
60.0' off set joint
60.0' pipe turns corrugated
164.0' eroded hole in bottom of pipe
170.0' pipe is cored in (12:00 - 3:00)
178.0' Service Connection (top)
186.0' hole in pipe (blasted

SKETCH



ICF KAISER ENGINEERS

Sewer Video Inspection Form

Date: 8/2/94 **Time:** 10:40
Contractor: Advanced Companies **Operator:** Arnie Huber

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: EE1000B SN 037 S. BAKER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PV4924 SN A951102

Tape #: Tape 4
Begining Tape Count: 1308
Ending Tape Count: 1457

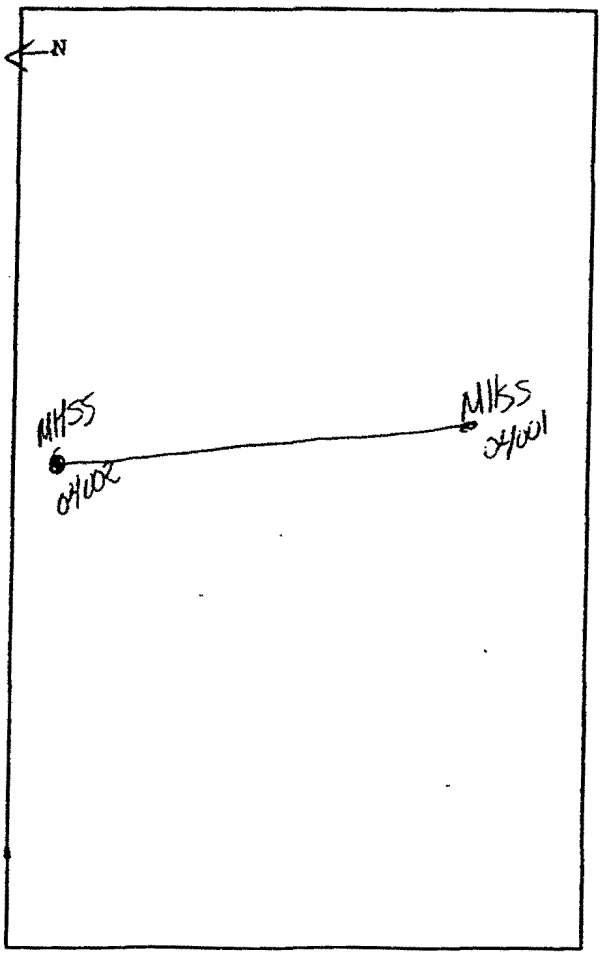
Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: MHSS 04002	NA	.8ppm	2082	NA	Dhole - 1.4ppm
MH #2: MHSS 04001	134.0'		1210		
MH #3:					
MH #4:					
MH #5:					
MH #6:					
MH #7:					

NOTES total 134.0'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

relined pipe
8.0' hole in top left of pipe
90.0' tap off set in line.
112.0' Service Connection on top.

SKETCH



ICF KAISER ENGINEERS

Sewer Video Inspection Form

Date: 8/2/94 **Time:** 10:55
Contractor: Advanced Companies **Operator:** Arnie Huber

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: EE1000 B SN 037 S. BAKER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: DU4924 SN A9511021

Tape #: Tape 4
Begining Tape Count: 1457
Ending Tape Count: ~~SB 1495~~ 1698

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: SD 03 014	NA	.8PPM	2082	NA	*Could go no farther
MH #2: MHSS 04002	116.0'	—	LEL 0	—	petruding service
MH #3: SD 03 013	118.0'	.8PPM	2082	NA	connections.
MH #4: SD 03 015	62.6'	—	—	—	
MH #5:		—	—	—	
MH #6:		—	—	—	
MH #7:		—	—	—	

NOTES total ~~196.6'~~ 196.0'

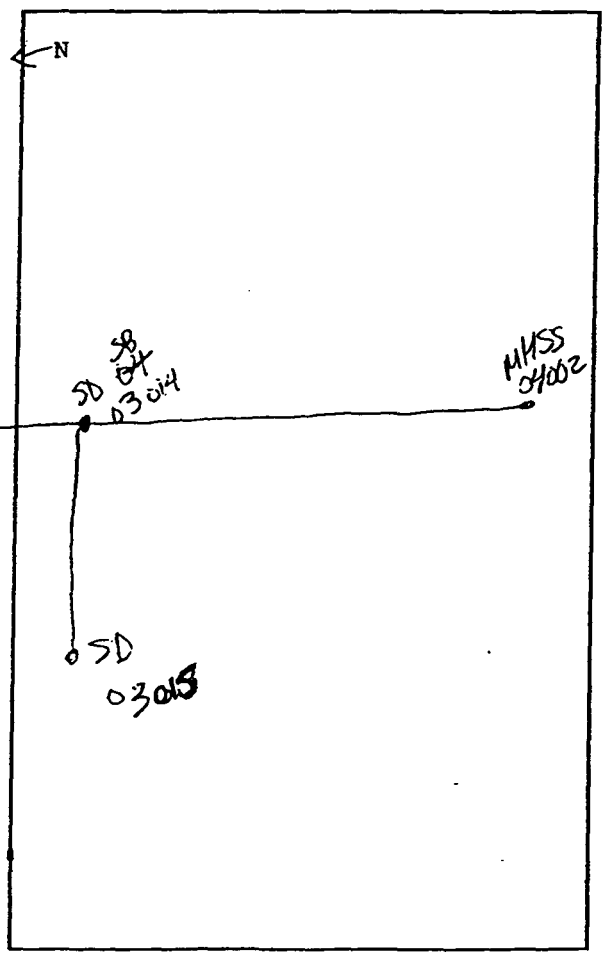
(Identify AOC, problem, footage, tape count, additional lines, etc.)

SD 03014 MHSS 04002 ~~pipe has been relined~~ SB
reinforced concrete
7.0' offset joint

SD 03014 SD 03013
relined pipe
0.0'-5.0' Belly in pipe
316.0' service connection (right)

SD 03014 SD 03015
57.6' cracked pipe (7.00 + 9.60 - 1.00)

SKETCH



ICF KAISER ENGINEERS

Sewer Video Inspection Form

36

Date: 8/2/94 **Time:** 1:00
Contractor: Advanced Companies **Operator:** Arnie Huber

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: EE1000B SN- 037 S. BAKER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PV4924 SN A951102

Tape #: Tape 4
Begining Tape Count: 1698
Ending Tape Count: 1892

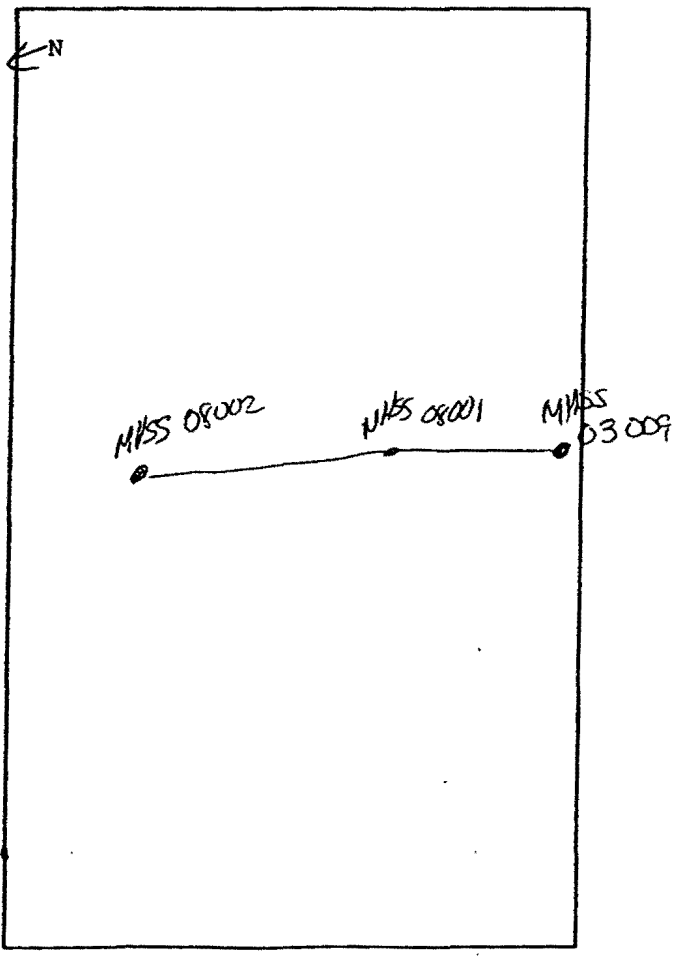
Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: MHSS 08002	NA	.8 ppm	2082	NA	*Couldn't go any farther
MH #2: MHSS 08001	120.0		LEL 0		in MHSS 03009 because
MH #3: MHSS 03009	170'	.8 ppm	2082	NA	heavy buildup 13.0
MH #4:			LEL 0		within the MH
MH #5:					
MH #6:					
MH #7:					

NOTES total - 137.0'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

49' PVC Service (left)
111.0' Service Connection (right)
10.0' heavy build up on ~~left~~ right side SB of pipe.

SKETCH



ICF KAISER ENGINEERS
Sewer Video Inspection Form

Date: 8/2/94 **Time:** 1:45
Contractor: Advanced Companies **Operator:** Arnie Huber

Video Camera Manufacturer: ARES
Video Camera Model #, Serial #: E21000B SN-037 S BAXTER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PV 4924 SN A9511021

Tape #: Tape 4
Begining Tape Count: 7892
Ending Tape Count: 2027

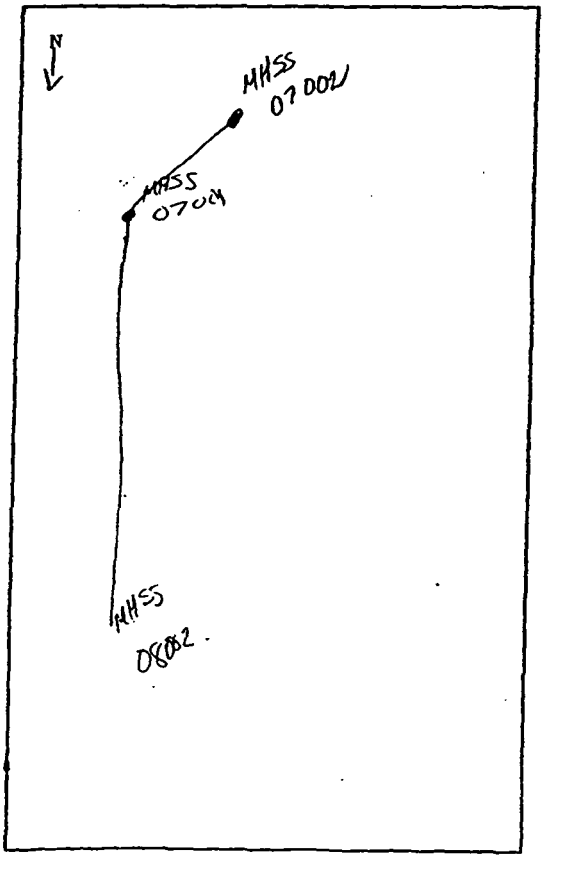
Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: MHSS 07001	NA	.8ppm	2082 LEL0	NA	*Couldn't video any
MH #2: MHSS 08002	32'				farther line is dirty
MH #3: MHSS 07002	15'	.8ppm	2082 LEL0	NA	
MH #4:					
MH #5:					
MH #6:					
MH #7:					

NOTES total 47.0'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

MHSS 07001 MHSS 08002 — ~~tied pipes~~
25' heavy deposit on right side

SKETCH



ICF KAISER ENGINEERS

Sewer Video Inspection Form

Date: 8/2/94 **Time:** 2:00
Contractor: Advanced Companies **Operator:** Arnie Huber

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: EE 1000B SN 037

S. BAKER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PV4924 SN A9S11021

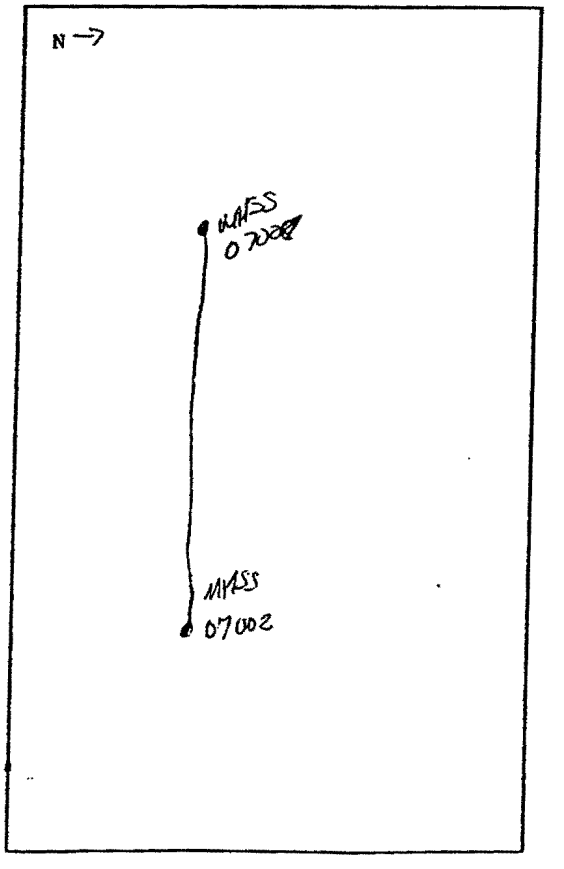
Tape #: Tape 4
Begining Tape Count: 2027
Ending Tape Count: 2047

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: MHSS07002	NA	~~Sgn~~	2088	NA	~~*~~ line is dirty still
MH #2: MHSS07008	11.0	—	LEL0	—	full of debris will
MH #3:		—	—	—	try a reverse step
MH #4:		—	—	—	
MH #5:		—	—	—	
MH #6:		—	—	—	
MH #7:		—	—	—	

NOTES total 11.0

(Identify AOC, problem, footage, tape count, additional lines, etc.)

SKETCH



ICF KAISER ENGINEERS

Sewer Video Inspection Form

Date: ~~8/8~~ 8/2/94 **Time:** 2:20
Contractor: Advanced Companies **Operator:** Arnie Huber

S. BAXTER

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: EE 1000 B SN 037

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PV 4924 SN A951102

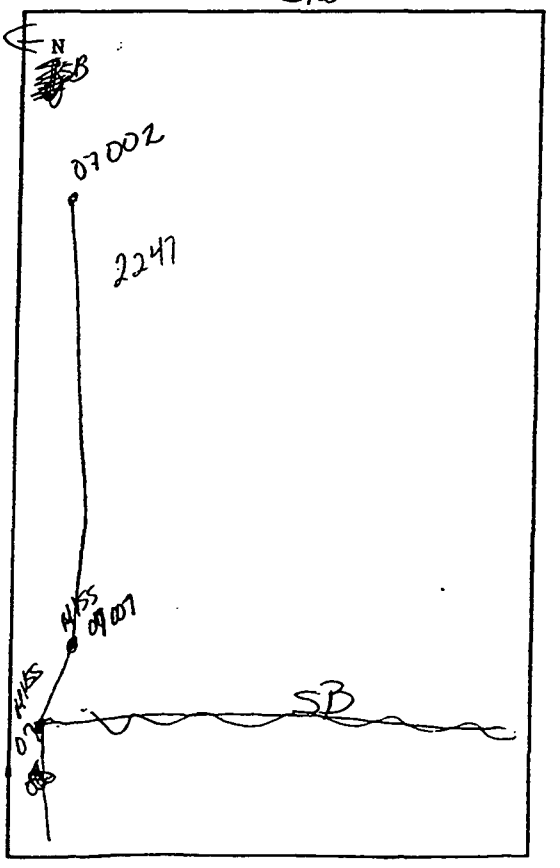
Tape #: Tape 4
Begining Tape Count: 2047
Ending Tape Count:

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: MHSS 07 007	NA	.8ppm	20%	NA	
MH #2: MHSS 07 002	128.0'		LEL 0		
MH #3:					
MH #4: 07 008	NA	.8ppm	20%	NA	* Couldn't video line
MH #5: 06 001			LEL 0		was full of debris
MH #6:					
MH #7:					

NOTES total 128.0'

(Identify AOC, problem, footage, tape count, additional lines, etc.)
87.0 Service Connection (top)

SKETCH
Sketch on back



ICF KAISER ENGINEERS

Sewer Video Inspection Form

Date: 8/2/94 **Time:** 3:05

Contractor: Advanced Companies **Operator:** Arnie Huber

Video Camera Manufacturer: Aries

Video Camera Model #, Serial #: EE 1000 B SN 037 S. BARTER

Manufacture of VCR: Panasonic

VCR Model #, Serial #: PV4924 SN AGS11021

Tape #: Tape 4

Begining Tape Count: 2047

Ending Tape Count: 2448

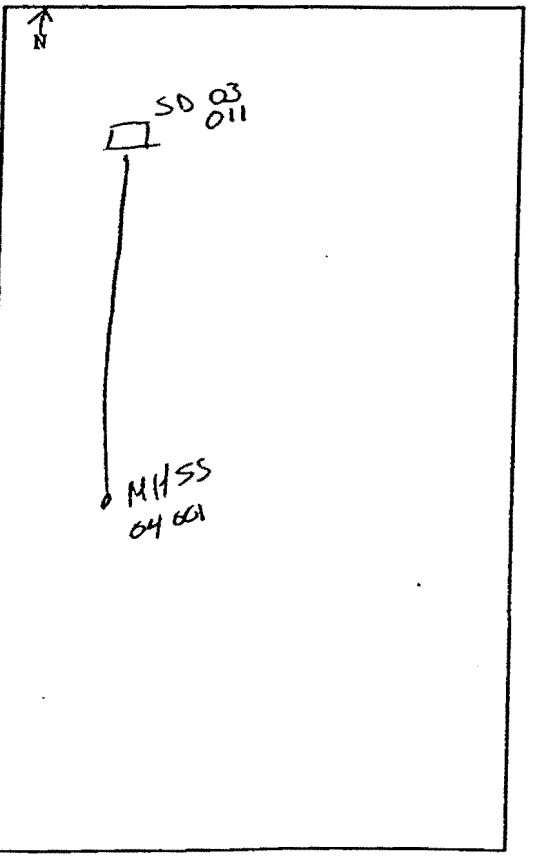
Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: SD 03 011	NA	.8ppm	2082	NA	* line has not been
MH #2: MHSS 64001	132.0'	—	1540	—	Cleaned but did
MH #3:		—	—	—	Video.
MH #4:		—	—	—	
MH #5:		—	—	—	Could only get to
MH #6:		—	—	—	132.0'.
MH #7:		—	—	—	

NOTES total. 132.0'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

195' cracked pipe (3:00 & 9:00)
210' Section is cracked
begining sections are
cracked in many places
75.0 crack (11:00 to 7:00)
95.0' crack (1:00)
110.0' off set joint
127.0' off set joint (bad)
129.0 cracked pipe (1:00)

SKETCH



ICF KAISER ENGINEERS
Sewer Video Inspection Form

Date: 8/9/94 **Time:** 8:05
Contractor: Advanced Companies **Operator:** Arnie Haber

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: EE 1000B SN -037 S. BAKER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: P.U. 4924 SN A951102

Tape #: Tape 4
Begining Tape Count: 2247
Ending Tape Count: 2495

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: MHSS 03088	NA	.8	20%	NA	* 5' into MH SS Sleeve
MH #2: SD 03 012	0		LEL 0		Shoved into line
MH #3: MHSS 02 010	19.3	.8	20%	NA	Couldn't video
MH #4:			LEL 0		
MH #5: SD 02 010	NA				* Service Connection Comes
MH #6: MHSS 03 088	80.0'	.8	20%	NA	from SD 02105
MH #7:			LEL 0		

NOTES total. 107.3'

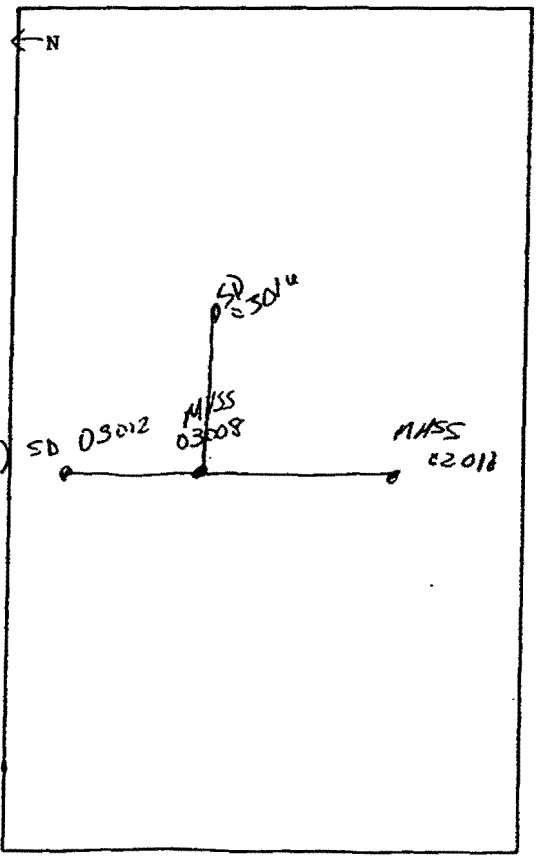
(Identify AOC, problem, footage, tape count, additional lines, etc.)

Could not video MHSS 03 088 to SD 03 012.

MHSS 03088 to MHSS 02 010:
- 0.0' cracked pipe (11.00)
- 6.0' top of pipe cracked
- 11.0' off set joint
- 19.0 large service connection (right)
- Will do a reverse setup

MHSS 02 010 to MHSS 03 088:
- 2.0' cracked pipe
- 12.0' cracked pipe (7:00)
- 15.0 crack (1:00-3:00)
- 36.0 tap roots running on bottom of pipe
- 44.0' Off set joint (roots in joint)
- 48.0' off set joint
- 55.0' possible mating joint
- 60.0' possible cracked joint (roots on right hand side)
- 72.0' mating joint
- 76.0' hole in pipe (left)
- 88.0' service connection (left) hit coming the other direction

SKETCH



ICF KAISER ENGINEERS
Sewer Video Inspection Form

Date: 8/3/94 **Time:** 8:45
Contractor: Advanced Companies **Operator:** Arnie Huber

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: EE 1000B SN 037 S. BATTER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PV4924 SN A9511021

Tape #: Tape 4
Begining Tape Count: 2495
Ending Tape Count: 2891

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: MHSS 02010	NA	.8ppm	20%	NA	Dhole - 1.4ppm
MH #2: MHSS 02007	34.0'		LEL-0		
MH #3:					
MH #4: MHSS 02007	NA	.8ppm	20%	NA	D.hole 1.4ppm
MH #5: MHSS 02010	19.0		LEL 0		
MH #6: MHSS 02003	97.0	.8ppm	20%	NA	LEL 0
MH #7: MHSS 01014	0.0'				

NOTES total 150.0'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

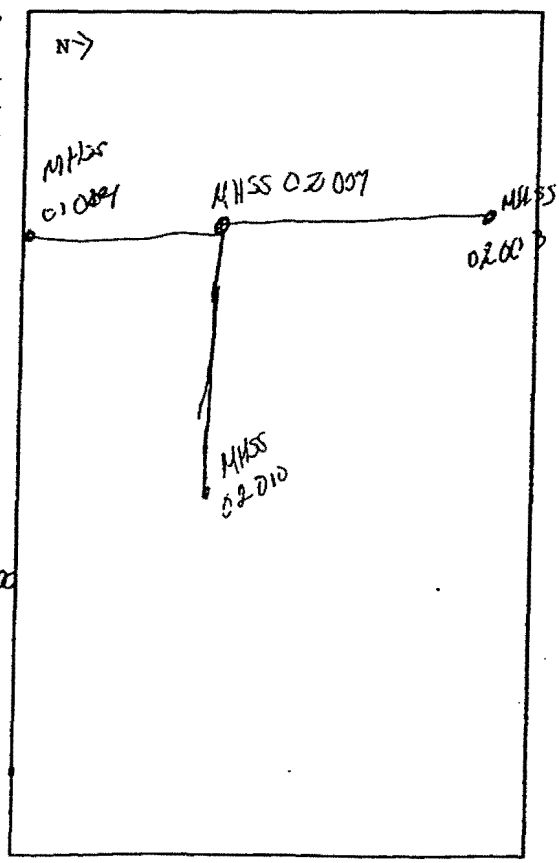
MHSS 02010 to MHSS 02007
- 5.0' Belly in line could only video 34.0' Debris in the line I will do a reverse set up

MHSS 02007 to MHSS 02010
- Reverse setting
- 19.0 Bend in pipe could video no farther. Crack in pipe after joint (8:00)

SS 02007 02003
- 12.0 Service connection (left)
- 40.0 open offset joint
- 45.0' off set joint
- 55.0 Cracked pipe (2:00)
- 5.50 leaky joint cracked pipe (12:00)
- 58.0 cracked pipe (2:00)
- 86.0 cracked pipe (1:00-4:00)
- 90.0 leaky joint
- 95.0' cracked pipe (1:00-4:00) + 8:00

Can't video 02007 to 01014 line is dirty

SKETCH



ICF KAISER ENGINEERS

Sewer Video Inspection Form

Date: 8/3/94 **Time:** 10:05 / 10:20 / 12:20
Contractor: Advanced Compression **Operator:** Arnie Huber

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: EE 1000B SN 037 S. BAXTER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PU4924 SN A9511021

Tape #: Tape 4
Begining Tape Count: 2891
Ending Tape Count: 2994

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: MHSS 07001	NA	.8pp	20.8%	NA	LELO
MH #2: MHSS 08002	42.0'	—	—	—	
MH #3:		—	—	—	
MH #4: MHSS 08002	NA	.8pp	20.8%	NA	LELO
MH #5: MHSS 07001	24.0'	—	—	—	
MH #6:		—	—	—	
MH #7:		—	—	—	

NOTES total 66.0'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

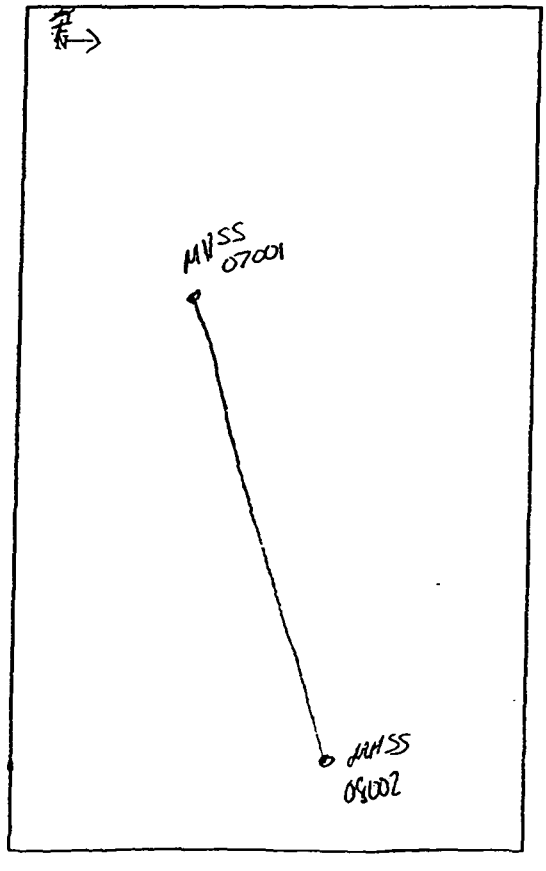
MHSS 07001 - MHSS 08002: Cracks in bottom of the line. Could not go any further. line was still dirty going to do a reverse setup.

MHSS 8002 to MHSS 07001: 0.0' Belly in manhole. 10.0' heavy deposits on the right side. 10.5' underwater. Could not video because line was dirty.

SB ~~[illegible]~~

Because of the majority of debris and high water we would have to pull the camera through and would not be able to see very much of the line.

SKETCH



ICF KAISER ENGINEERS

Sewer Video Inspection Form

Date: 8/3/94 **Time:** 1:00
Contractor: Advanced Companies **Operator:** Arnie Hubal

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: EE 1000 B SN 037 S. BAXTER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PV 4924 SN A 9511021

Tape #: Tape 4
Begining Tape Count: 2994
Ending Tape Count: 3145

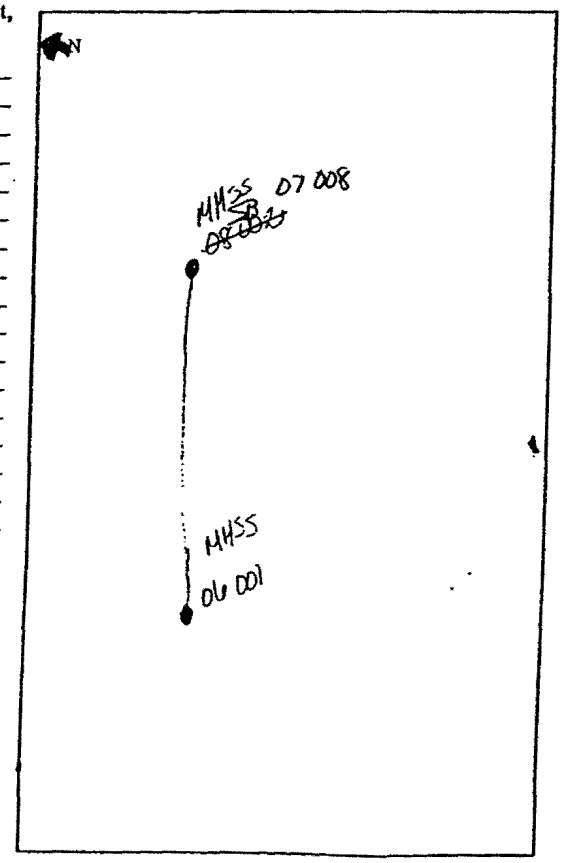
Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: MHSS ~~08~~ 07 008	NA	.8pm	2088	NA	* pipe was large and it
MH #2: MHSS 06 001	98'				was difficult to see the
MH #3:					top of the pipe
MH #4:					
MH #5:		Drole	1.2pm		
MH #6:					
MH #7:					

NOTES total 98.0'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

3.0' service connection (right)
60.0' Under water (Belly) 1
72.0' came out of Belly 1
80.0' Another Belly

SKETCH



SB ~~43~~ 45

ICF KAISER ENGINEERS
Sewer Video Inspection Form

Date: 8/3/94 **Time:** 1:30
Contractor: Advanced Companies **Operator:** Arnie Huber

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: SE 1000 B SN 037 S. BAXTER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PV4924 SN A951021

Tape #: Tape 4
Begining Tape Count: 3145
Ending Tape Count: ~~3312~~ 3459

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: MHSS 06001	NA	.8ppm	2088		LEL-0 Dhole 1.7pp.
MH #2: ~~SD 06007 SB~~					NON SUSTAINED hits
0 06-007 MH #3: ~~MHSS 06006 SB~~	~~3233-215'~~				on HNU
MH #4: ~~SD 06007~~					
MH #5: SSD 05003	99.0'	.8ppm	2088		
MH #6:			LEL 0		
MH #7:					

NOTES total 324.0'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

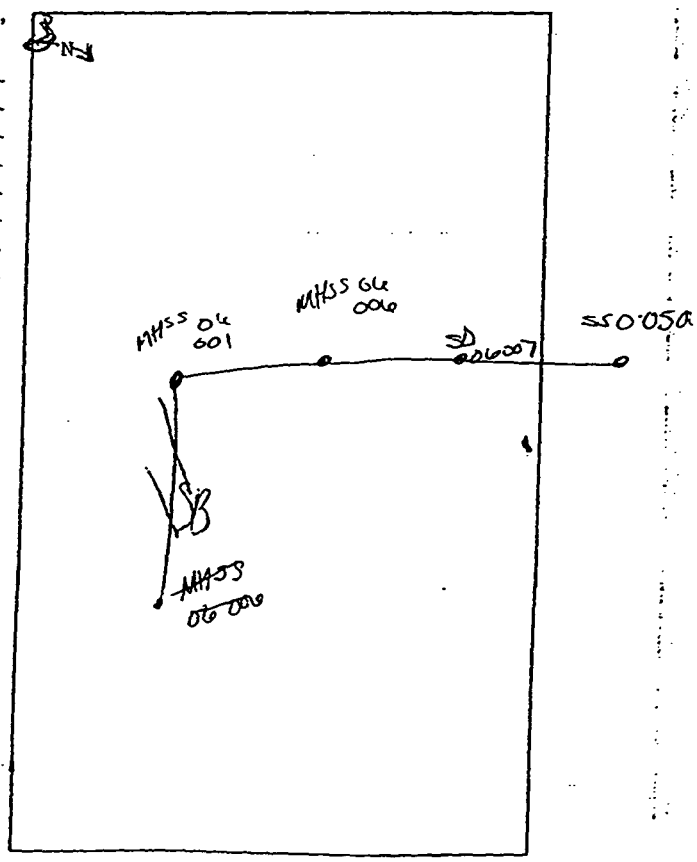
SS-06001 to MSS 06006 to D06007

lots of cracks on bottom
30.0' cracked pipe
61.0' off set joint
70.0' cracked pipe (3:00-9:00)
81.0' off set joint
88.0' large crack
97.0 off set joint
circular cracks through entire line
131.0' off set joint.
141.0' off set joint
152.0' bad off set joint
160.0' off set joint
175.0' Manhole
186.0' bad off set joint
188.0' Service connection (top)
196.0' Service connection (top)

Circular surface cracks on bottom of line
98.0' Back is in the way cannot video the rest of the line.

Visually looking at the SSD radial cracks were been only of 12" to 18"

SKETCH



ICF KAISER ENGINEERS

Sewer Video Inspection Form

Date: 8/3/94 **Time:** 3:05
Contractor: Advanced Companies **Operator:** Arnie Huber

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: EE 1000 B SN 037 S. BAKER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PU4924 SN A9S1021

Tape #: Tape 4
Begining Tape Count: 3459
Ending Tape Count: 3775

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: SD 01 009	NA	.8ppm	20.8%	N/A	SD 01 101 is not present in
MH #2: SD 01 008	96'	—	LEL 0	—	field, not present on
MH #3: MHSS 01011	0'	—	—	—	video
MH #4:		—	—	—	
MH #5: SD 01008	NA	.8ppm	20.8%	NA	
MH #6: SD 01009	65.0'	—	LEL 0	—	
MH #7:		—	—	—	

NOTES total 74.0'

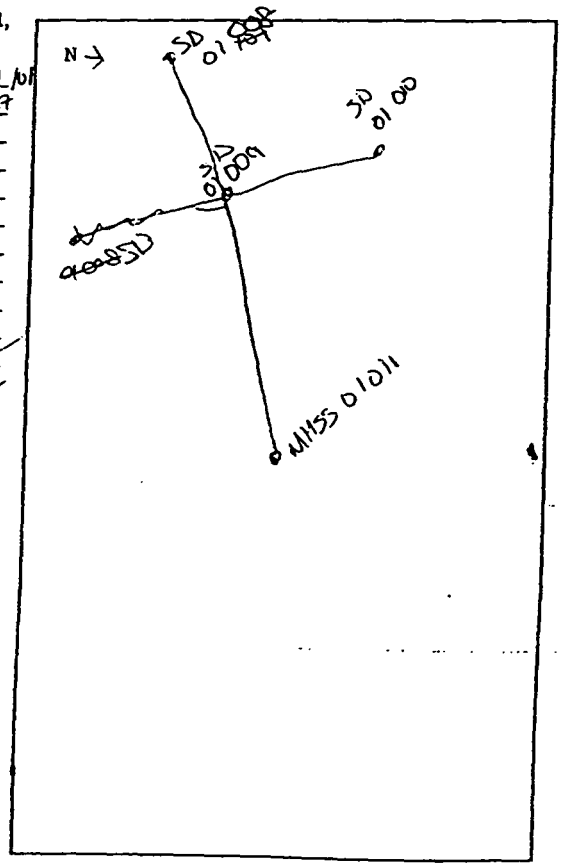
(Identify AOC, problem, footage, tape count, additional lines, etc.)

SD 01007 to SD 01008: Doing a reverse setup for SD 01009 to SD 01007 Could not video because there was alot of debris in the lines

SD 01009 to MHSS 01011: Can not video SD 01009 to MHSS 01011 due to heavy debris in beginning of the line.

SD 01008 to SD 01009: 39.0' offset joint 52.0' pipe changed to concrete was corrugated in the beginning

SKETCH



SB A3
47

ICF KAISER ENGINEERS
Sewer Video Inspection Form

Date: 8/3/94 **Time:** 3:35
Contractor: Advanced Companies **Operator:** Arnie Huber

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: EE 1000 B SN-037 S. BAXTER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PV 4924 SN A9511021

Tape #: Tape 4
Begining Tape Count: 3775
Ending Tape Count: 4074

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: SD01008	NA	.8ppm	20%	NA	MHSS 01 004 is not there
MH #2: SD 01007	94.0'		LEL 0		Came upon SD 01003
MH #3: SD 01006	58.0'				
MH #4: SD01005	18.0'	.8ppm	20%	NA	
MH #5: ~~MHSS 01004~~ SD 01003 SB	47.0'				
MH #6:					
MH #7:					

NOTES total 207.0'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

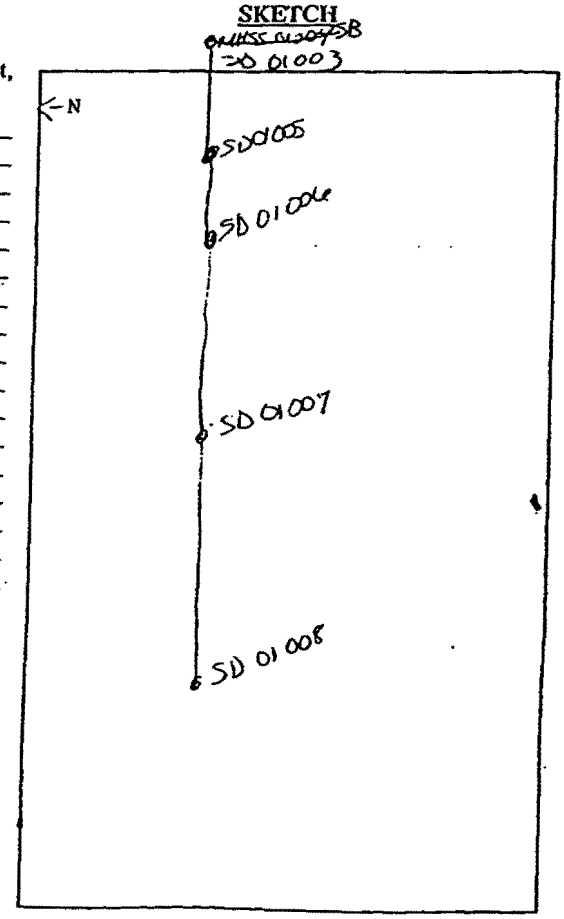
SD 01008 to SD 01007
- 60' crack (4:00 + 10:00)
- 20.0' hammer tap (left side)
- 43.0' service connection (left)
- 54.0' cracked pipe (8:00 + 11:00)
- 63.0 Bad offset joint

SD 01007 to SD 01006 to SD 01005
- 8.0' off set and leaky joint
- 27.0' crack at 8:00
- 32.0' crack at 10:00

SD 01005 — SD 01003
- 19.0 crack (11:00)

* Did not collect on voice over on video. Voice over ended with MHSS 01004 should have noted SD 01003 SEE MHSS 01004 does not exist in field
/ccs

SKETCH



SB-45
48

ICF KAISER ENGINEERS

Sewer Video Inspection Form

Date: 8/4/94 **Time:** 8:10
Contractor: Advanced Companies **Operator:** Arne Huber

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: EE 1000 B SN 037 S. BAXTER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PV 4924 SN A9511021

Tape #: Tape 4
Begining Tape Count: 4074
Ending Tape Count: 4292

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: SD01003	NA	.8ppm	20.8%	NA	* Was unable to video
MH #2: SD06008	93.0'	—	LEL 0	—	line SD 06008 to SD06007
MH #3: SD06007	9.0'	—	—	—	the line is full of
MH #4:		—	—	—	debris. Doing a reverse
MH #5: SD06007	NA	—	—	—	set up.
MH #6: SD06008	81.0'	.8ppm	20.8%	NA	
MH #7:		—	LEL 0	—	

NOTES total 183.0'

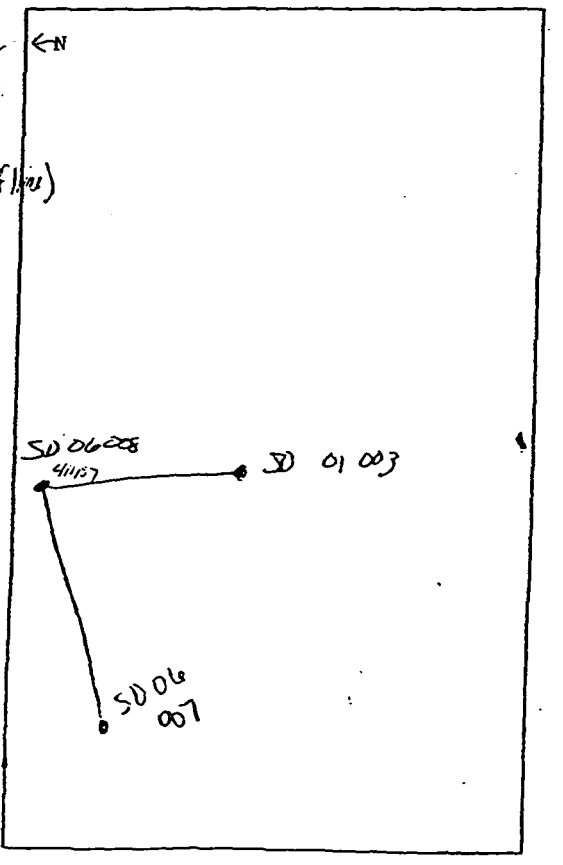
(Identify AOC, problem, footage, tape count, additional lines, etc.)

01003 to 06008
7.0' cracked pipe (1:00)
22.0' cracked pipe (1:00)
39.0' cracked pipe (9:00)
46.0' cracked pipe (3:00-4:00)
Deposits are built up on sides (end of line)
84.0' Belly at end of line

Going to try a reverse set up for line SD 06008 to SD 06007

5.0 cracked pipe (7:00-11:00)
23.0 cracked pipe (8:00-11:00)
34.0' Service connection at top
73.0' Bad offset
77 Debris which was seen coming from the other direction

SKETCH



SB ~~45~~ 49

ICF KAISER ENGINEERS

Sewer Video Inspection Form

Date: 8/4/94 **Time:** 9:15

Contractor: Advanced Companies **Operator:** Arnie Huber

Video Camera Manufacturer: Ra Aries

Video Camera Model #, Serial #: 82 1000 B SN-037 S. BAMER

Manufacture of VCR: Panasonic

VCR Model #, Serial #: PV4924 SN A9511021

Tape #: Tape 1

Begining Tape Count: 4292

Ending Tape Count: 4482

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: SD 06 015	NA	.8pp	2082	NA	*MH SS 06 500 is not on
MH #2: Clean out Bldg 48	31.0'		LEL-0		the drawing but is in
MH #3: ~~SS 05 100~~ SB	63.0'	.8pp	2082	NA	the field
MH #4: MH 06 500			LEL-0		
MH #5:					
MH #6:					
MH #7:					

NOTES total 94.0'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

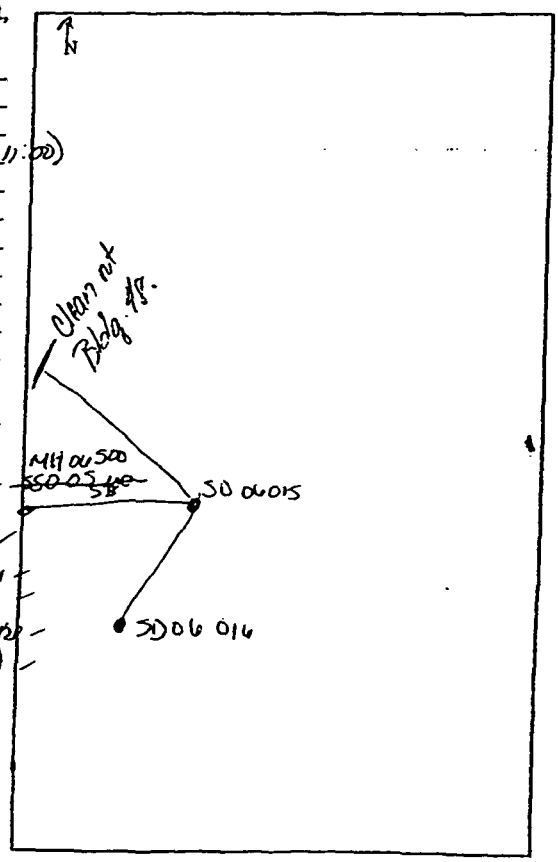
SD 06 015 to clean out Bldg 48

- 6.0' off set joint ~~cracked pipe~~
- hole in wall (11:00)
- 13.0 off set joint
- 15.0 surface cracks (3:00 9:00, 10:00 + 11:00)
- 24.0 cracked pipe (2:00)
- 27.0' off set joint
- 31.0' "Y" and the clean out.

SD 06 015 to SS 05 500 BES HRS 6-4W

- 3.0' Bad off set joint
- 6.0' Cracked pipe (3:00)
- 8.0' possible leaky joint
- 16.0' radial crack
- 21.0' new piece of pipe
- Bug 31.0' off set joint
- off set joints go all the way down the hill
- 44.0' possible leak
- 53.0 Belly in pipe
- 57.0 open leaky, bad offset joint
- 59.0 cracked pipe (6:00)
- 60.0 eroded (sediment) bottom of pipe
- 63.0 drop at bottom of pipe (MH)
- drop manhole

SKETCH



SB 45
50

ICF KAISER ENGINEERS

Sewer Video Inspection Form

Date: 8/4/94 **Time:** 9:45
Contractor: Advanced Companies **Operator:** Arnie Huber

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: EE1000B SN-037 S. BATTER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PV 4904 SN A951102

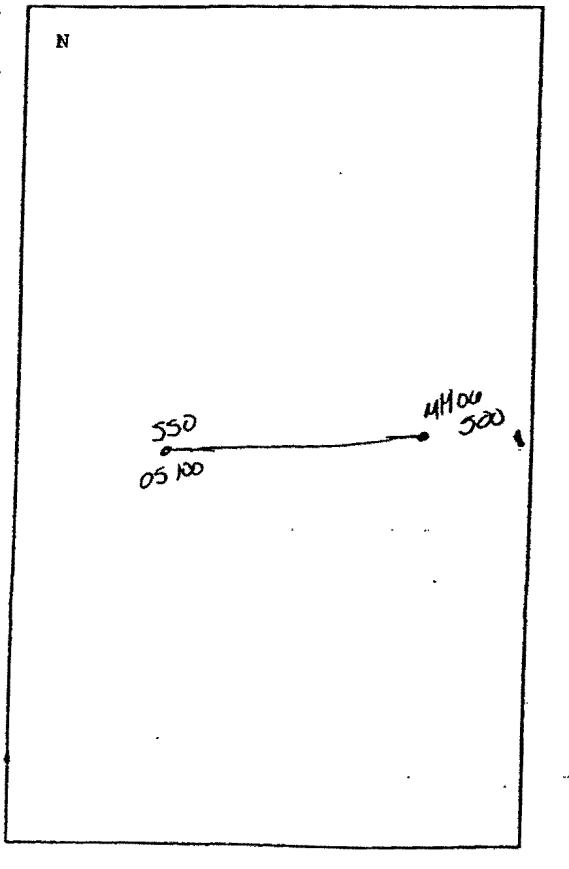
Tape #: Tape 4
Begining Tape Count: 2482
Ending Tape Count: 4481

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: MH SS 06500	NA	.8ppm	2082	N>	* Big drop umble
MH #2: SSD 05100	0		LEGO		to video camera would
MH #3:					get stuck
MH #4:					
MH #5:					
MH #6:					
MH #7:					

NOTES total 0

(Identify AOC, problem, footage, tape count, additional lines, etc.)

SKETCH



SB 45
51

ICF KAISER ENGINEERS
Sewer Video Inspection Form

Date: 8/4/94 **Time:** 9:55
Contractor: Advanced Companies **Operator:** Arnie Huber

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: EE1000B SN-037 S. BAKER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: DV 4924 SN A9511021

Tape #: Tape 4
Begining Tape Count: 4482
Ending Tape Count:

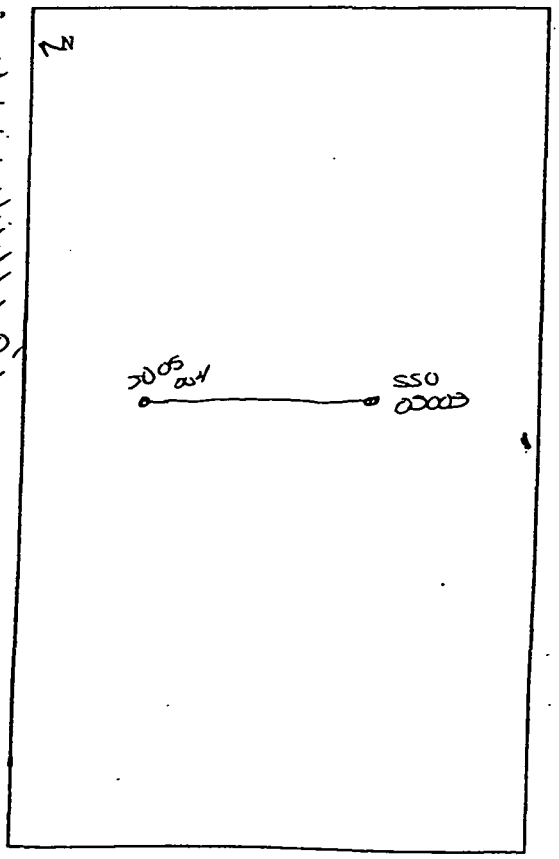
Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: SD05004	NA	.8ppm	20.8%	NA	
MH #2: SSO 05003	60'				
MH #3:					
MH #4:					
MH #5:					
MH #6:					
MH #7:					

NOTES total 60.0'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

50' off set joint
130 cracked pipe (8:00 3:00)
160 offset joint chipped bell
200 cracked pipe (4:00 + continuous)
220' crushed bell
250' crack (12:00)
290' off set joint
340' circular crack
350 possible leak (3:00)
360 off set joint
480' off set joint crack at (1) 3 joints (9:00)
580 crack from (12-4:00-6:00)

SKETCH



SB 43
52

ICF KAISER ENGINEERS
Sewer Video Inspection Form

Date: 8/4/94 **Time:** 10:40
Contractor: Advanced Computers **Operator:** Arnie Huber

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: ES 1000 B SN-037 S. BAXTER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PV 4924 SN A9511021

Tape #: Tape 4
Begining Tape Count: 4550
Ending Tape Count: 4697

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: SSO 01500 no MH	NA	Eqp	20.8%	—	*SSO 01500 is not on
MH #2: SD 01021	141.0'	—	CEC 0	—	drawing but in field
MH #3:		—	—	—	
MH #4:		—	—	—	Could not video any
MH #5:		—	—	—	farther a rock was
MH #6:		—	—	—	in the way
MH #7:		—	—	—	

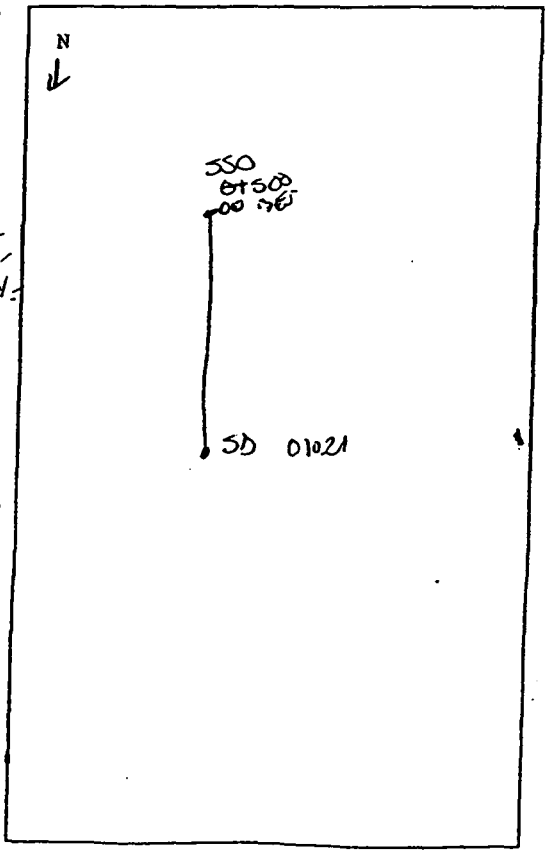
NOTES total 141.0'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

5.0' off set joint
12.0 crack (12:00 to 11:00, 1:00)
17.0' off set joint (pad)
18.0 many surface cracks
20 off set joint (heater)
23.0 Bad open joint
30.0 crack at 12:00; offset joint
33.0' Bad off set joint and bend
38.0 Bad off set joint and bend
~~39.0 Bad SB~~
39.0 repair section of pipe
40.0' leaky joint
42.0 crack 12:00 continues
55.0' offset joint
80.0' offset joint
cracks run across top of pipe
90.0 leaky joint & service connection to the right
94.0 service connection (top right)
95.0 surface cracks
129.0' offset joint
140.0 service connection to the left

Cannot video any farther a rock is in the way of the camera

SKETCH



SD ~~43~~ 53

ICF KAISER ENGINEERS

Sewer Video Inspection Form

Date: 8/4/94 **Time:** ~~11~~ 12:10

Contractor: Advanced Companies **Operator:** Arnie Huber

Video Camera Manufacturer: Aries

Video Camera Model #, Serial #: 25 1000B SN-037 S. BAXTER

Manufacture of VCR: Panasonic

VCR Model #, Serial #: PV4924 SN A951102

Tape #: Tape 4

Begining Tape Count: 4697

Ending Tape Count: 4777

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: MHSS 02 0041	NA	.8ppm	20%	NA	—
MH #2: MHSS 02 005	59.0'	—	LEL0		
MH #3: ~~SD MHSS 0300 SD~~	—	—	—		
MH #4: SD 02006	31.0	.8ppm	00%	NA	—
MH #5:		—	LEL0		
MH #6:		—	—		
MH #7:		—	—		

NOTES total 91.0'

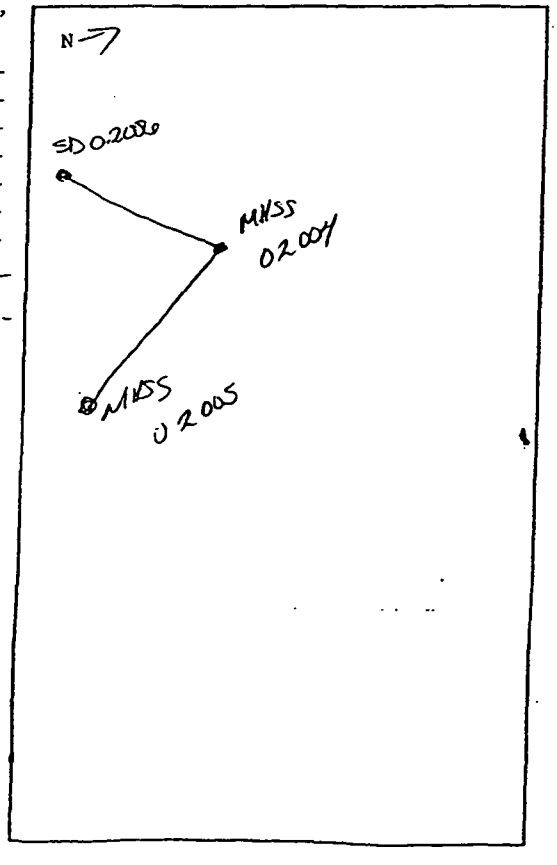
(Identify AOC, problem, footage, tape count, additional lines, etc.)

MHSS02 0041 to MHSS02005

6.0' Crack (10:00)
14.0' off set joint
21.0' Off set joint
25.0' many cracks
30.0 crack (8:00)
37.0 off set joint
45.0' crack (11:00)

Belly at Beginning of line
24.0' roots coming out of the joint

SKETCH



SB 43
54

ICF KAISER ENGINEERS

Sewer Video Inspection Form

Date: 8/4/94 **Time:** 12:35
Contractor: Advanced Companies **Operator:** Annie Huber

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: EE1000B SN-037 S. BAYTER

Manufacture of VCR: Panasonic
VCR Model #; Serial #: PV 4924 SN A951/021

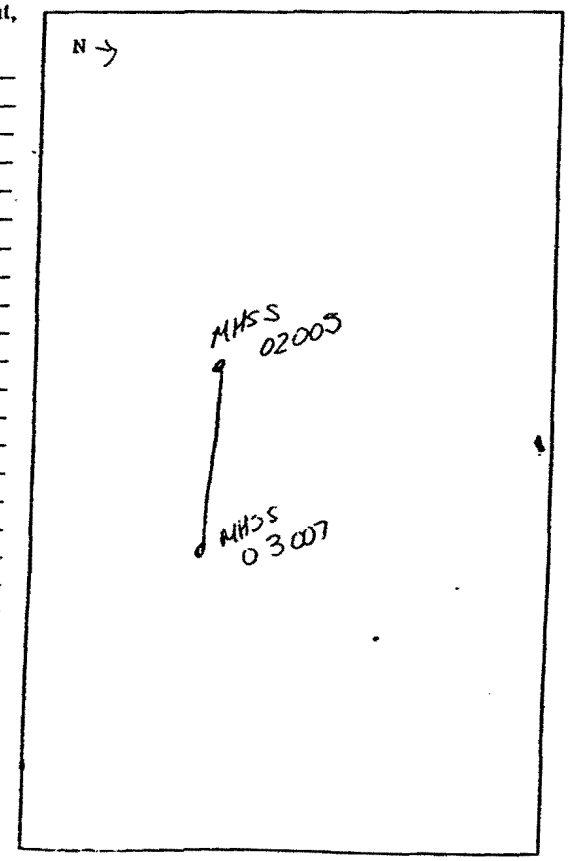
Tape #: Tape 4
Begining Tape Count: 4777
Ending Tape Count:

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: MHSS 02 005	NA	.8ppm	20%	NA	* line is full of debris
MH #2: MHSS03007	0'		LEL-0		cannot video.
MH #3:					
MH #4:					
MH #5:					
MH #6:					
MH #7:					

NOTES total 0'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

SKETCH



SB 43
55

ICF KAISER ENGINEERS
Sewer Video Inspection Form

Date: 8/4/94 **Time:** 1:00
Contractor: Advanced Companies **Operator:** Arnie Huber

Video Camera Manufacturer: Ariel
Video Camera Model #, Serial #: EE 1000B SN-037 S. BAXTER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PV4924 SN AG5 11021

Tape #: Tape 4
Beginning Tape Count: 4777
Ending Tape Count: ~~SB~~ 4851

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: ~~SB~~ SD 03020	NA	.8ppm	20%	NA	—
MH #2: ~~SB~~	—	—	LEL 0		
MH #3: ~~SB~~	—	—	—		
MH #4: SD 03018	85.0'	.6ppm	20%	NA	—
MH #5: SD 03021	80.0'	.6ppm	20%	NA	
MH #6: SD 03000		—	LEL 0		
MH #7:					

NOTES total 166.0'

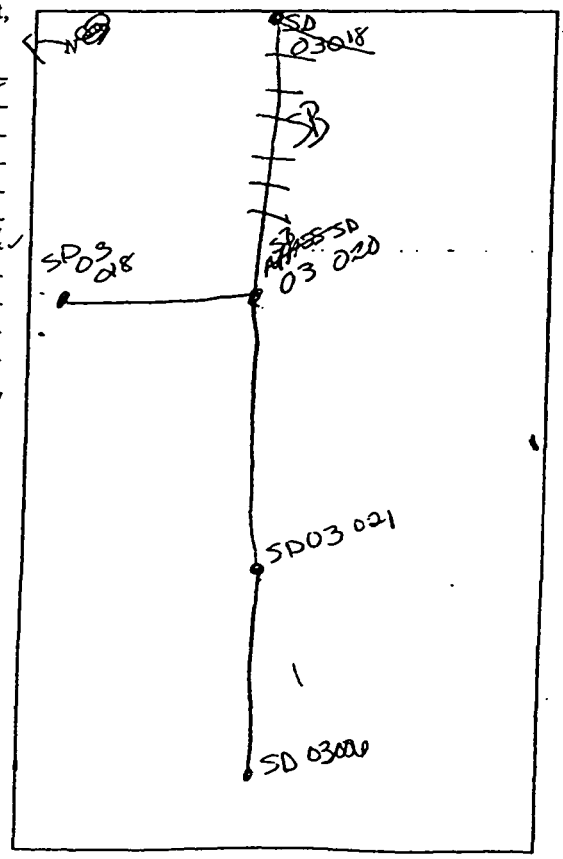
(Identify AOC, problem, footage, tape count, additional lines, etc.)

SD 03020 to SD 03018
- 5.0' crack (3:00)
- 8.0' circular crack
- 32.0' service connection (left)
- 34.0 crack (5:00-5:00)
- 60.0 crack (10:00)
- 80.0' cracks (12:00)

Couldn't video any farther - debris in line within 10' of SD 03018

SD 03020 to SD 03021
- 16.0' crack at 12:00
- 21.0' crack (3:00)
- 270 crack (11-7) (4-1)
- cracks every few inches down entire pipe.
- 38.0' circular cracks.
- 62.0' crack (1:00-6:00)

SKETCH



SB 5/2

ICF KAISER ENGINEERS

Sewer Video Inspection Form

Date: ~~8/11/94~~ SB 8/9/94 **Time:** 8:35

Contractor: Advanced Companies **Operator:** Arnie Huber

Video Camera Manufacturer: Aries

Video Camera Model #, Serial #: EE 1000 B SN-037

S. BATTER

Manufacture of VCR: Panasonic

VCR Model #, Serial #: PU4924 SN A95 11021

Tape #: SB ~~Tape 4~~ Tape 5

Begining Tape Count: ~~485~~ SB 0000

Ending Tape Count: 0110

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: SD 03021	NA	.6ppm	2082	NA	D.hole - .6ppm
MH #2: SD 03006	43.0'		LEL 0		
MH #3:					
MH #4:					
MH #5:					
MH #6:					
MH #7:					

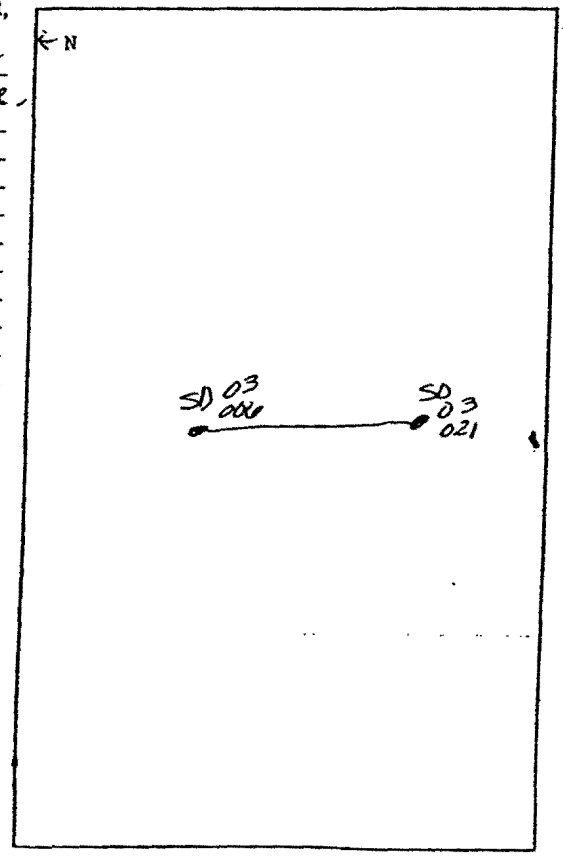
NOTES total 43.0'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

16.0 cracked pipe (11:00)

35.0 heavy buildup on side of pipe.

SKETCH



~~SD45~~ 57

ICF KAISER ENGINEERS

Sewer Video Inspection Form

Date: 8/9/94 **Time:** 9.10
Contractor: Advanced Companies **Operator:** Arnie Huber

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: EE 1000B SN-037 S. BAKER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PU4924 SN A951102

Tape #: Tape 5
Begining Tape Count: 0110
Ending Tape Count: ~~0108 0950~~ 01648

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: SD03019	NA	.6PPM	20.8%	NA	DH - .6PPM
MH #2: SD03018	53.0'		LEL 0		
MH #3: SD03023	55.0'				
MH #4: SD03022	56.0'	.6PPM	20.8%	NO	
MH #5: SD04012	56.0'		LEL 0		
MH #6: SD04011	58.0'	.6PPM	20.8%	NO	DH - .8PPM
MH #7:					

NOTES total 278.0'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

SD03019 to SD03018
- 1.0' crack (8:00-10:00)
- 20.0' circular crack also crack (10:00)
- 30.0' crack (12:00)
- 49.0' Root.
- Cracked pipe from 49.0' to manhole.

SD03019 to SD03023
- 2.0' circular crack
- 4.0' circular crack
- 34.0' deposits on top of pipe
- 38.0' crack at 10:00
- 49.0' crack at 12:00

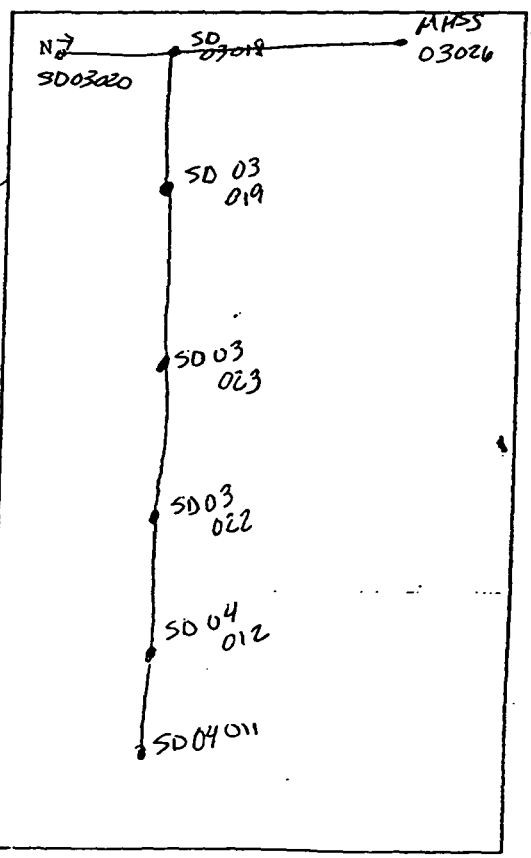
SD03023 to SD03022
- cracks coming from SD 10:00-2:00.
- 6.0' deposit on top of pipe
- 7.0' crack at 4:00
- 40.0' crack 10:00
- 46.0' cracks

SD03022 to SD04012
- 9.0' Deposits at 1:03
- 16.0' crack (11:00-7:00)
- 22.0' circular crack
- 39.0' crack from 11:00 to 1:00 hard top.
- 44.0' crack 9:00 possible leak
- 51.0' crack 12:00 possible leaky joint

SD04012 to SD04011
- 4.0' crack at 8:00.
- 7.0' possible leaky joint
- 20.0' crack 8:00 and 10:00

(on back)

SKETCH



SB ~~43~~ 58

ICF KAISER ENGINEERS

Sewer Video Inspection Form

Date: 8/9/94 **Time:** 9:40

Contractor: Advanced Companies **Operator:** Arnu Huber

Video Camera Manufacturer: Aries

Video Camera Model #, Serial #: SE 1000B SN-037 S. BAXTER

Manufacture of VCR: Panasonic

VCR Model #, Serial #: PV4924 SN A9S11021

Tape #: Tape 5

Begining Tape Count: ~~SB 0282 0950~~ 01018

Ending Tape Count: ~~SB 0282 0950~~

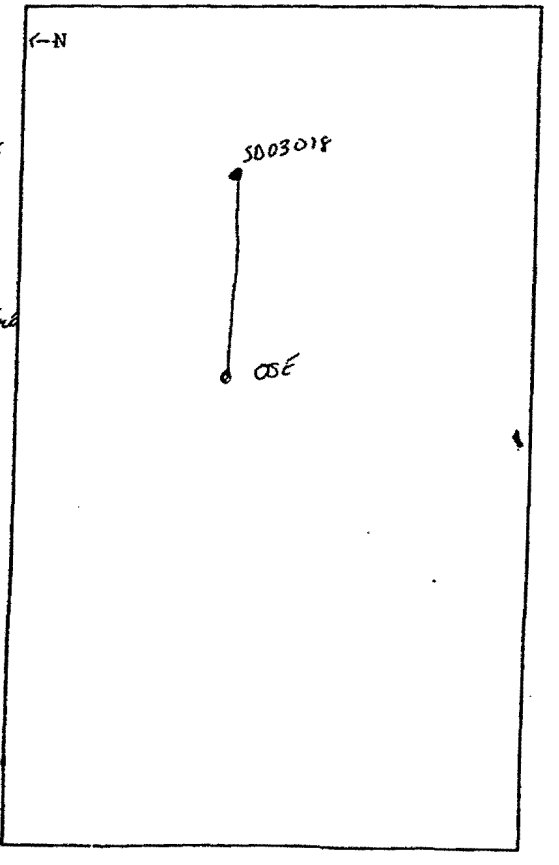
Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: SD03018	NA	~~.888~~	2082	NA.	
MH #2: OSE	121.0'		LELO		
MH #3:					
MH #4:					
MH #5:					
MH #6:					
MH #7:					

NOTES total 121.0'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

16.0' pipe changed to cast iron
24.0' enlarged service connection
45.0 possible crack
63.0 service connection "Y" off to left.
64.0 service connection to right.
comes to smaller line
75.0' crack (9:00)
99.0' circular crack
101' circular crack
crack at (4:00 to 7:00) continues down the line
115.0' crack (8:00)
118. service connection to the right.
120. another service connection goes to much smaller pipe.
end the run at a "Y" in the pipe

SKETCH



SB 43 59

ICF KAISER ENGINEERS
Sewer Video Inspection Form

Date: 8/9/94 **Time:** 11:05
Contractor: Advanced Companies **Operator:** Arnie Huber

Video Camera Manufacturer: Ares
Video Camera Model #, Serial #: EE 1000 B SN - 037 S. BATTER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PV4924 SN A9511021

Tape #: Tape 5
Begining Tape Count: 0950
Ending Tape Count: 1244

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: MHSS 08011	NA	.6ppm	20%	NA	D. Hole .6ppm
MH #2: SD 08 013	59.0'		LEL 0		
MH #3: SD 08 017	35.0'	.6ppm	20%	NA	Dhole - .6ppm
MH #4: MHSS 08010	48.6'				
MH #5:					
MH #6:					
MH #7:					

NOTES total 142.6'

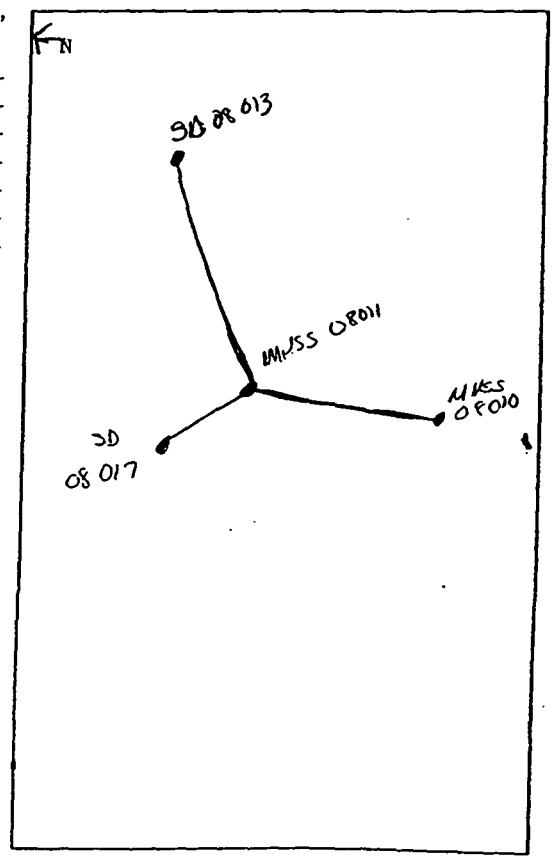
(Identify AOC, problem, footage, tape count, additional lines, etc.)

SS 08011 to SD 08013
- 20.0' circular crack
- 26.0' circular crack
- 52.0' circular crack
- 57.0' (9:00, 3:00, 11:00, 2:00) cracks
- * could go no farther debris in line about 85.0' from SD 08013

MHSS 08011 to SD 08 017
- 25.0' crack (11:00)
- 27.0 Bad offset joint
- 28.0 Cracked (12:00)
- 29. circular pipe

MHSS 08011 to MHSS 08010
- 29.0' circular crack
- 34.0' leaking joint
- 42.0' offset (bad)

SKETCH



SB 43 60

ICF KAISER ENGINEERS

Sewer Video Inspection Form

Date: 8/9/94 **Time:** 12:55
Contractor: Advanced Companies **Operator:** Arnie Huber

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: SE1000B SN. 037 S. BAKER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PU4924 SN A9511021

Tape #: Tape 5
Begining Tape Count: 1244
Ending Tape Count: 1336

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: ~~MHSS~~ SD 08013	NA	.6ppm	2052		Dhole - 6 ppm
MH #2: MHSS 08014	63.0'		1510		
MH #3: MHSS 08012	41.0'	.6ppm	2082		Dhole - 6 ppm
MH #4:			1510		
MH #5:					
MH #6:					
MH #7:					

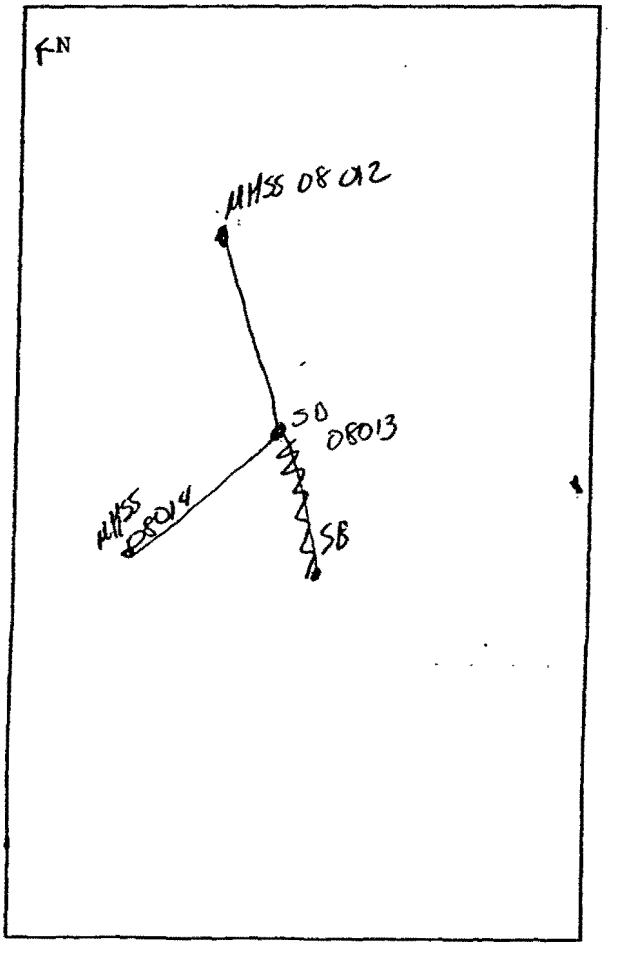
NOTES total 104.0'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

MHSS08014 from SD08013:
36.0' offset joint
60.0' circular crack

SD08013 to MHSS08012:
37.0' cracks (4 OD)

SKETCH



SB 48
Cel

ICF KAISER ENGINEERS

Sewer Video Inspection Form

Date: 8/9/94 **Time:** 1:25
Contractor: Advanced Companies **Operator:** Arnie Huber

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: EE 1000B SN-037

S. BAKER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PV 4924 SN A9511021

Tape #: Tape 5
Begining Tape Count: 1336
Ending Tape Count: 1442

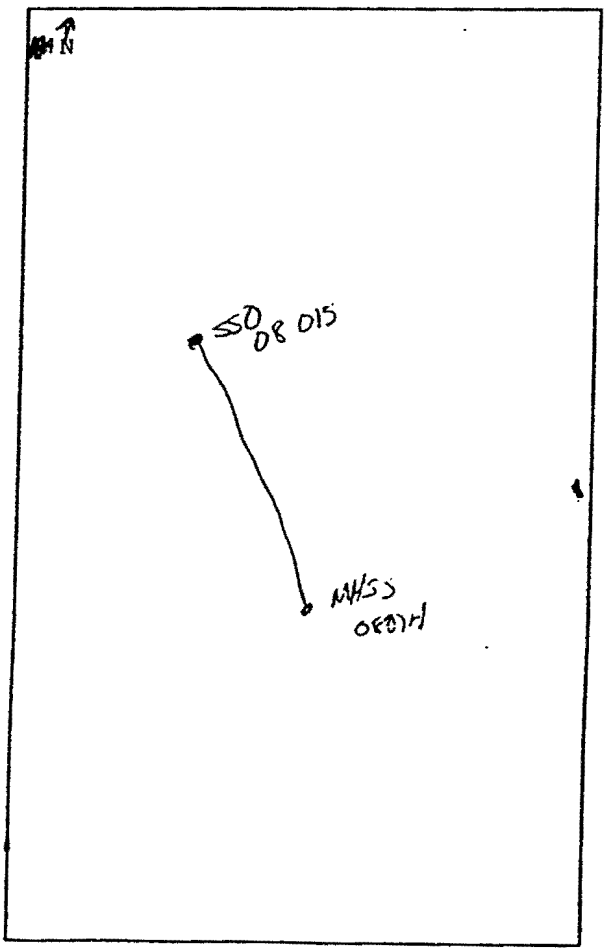
Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: ~~MH5S08014 SB~~	NA				
MH #2: ~~SSO 08015 SB~~					
MH #3: SSO 08015	NA	.6ppm	2086		
MH #4: MH5S08014	49.5'		LEL0		
MH #5:					
MH #6:					
MH #7:					

NOTES total 49.5'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

Camera is ~~about~~ SB below water
10.0' some out of water
22.0' cracked pipe (5:00)
40.0 Belly
45.0 joint off set joint
49.0' cracks on bottom of pipe
about 13.0' fed from the manhole

SKETCH



SB 42

ICF KAISER ENGINEERS

Sewer Video Inspection Form

Date: 8/9/94 **Time:** 1:55

Contractor: Advanced Companies **Operator:** Arnie Huber

Video Camera Manufacturer: Aries

Video Camera Model #, Serial #: EE 1000B SN-037

S. BAXTER

Manufacture of VCR: Panasonic

VCR Model #, Serial #: PU4924 SNAFS11021

Tape #: Tape 5

Begining Tape Count: 1441

Ending Tape Count: 1472

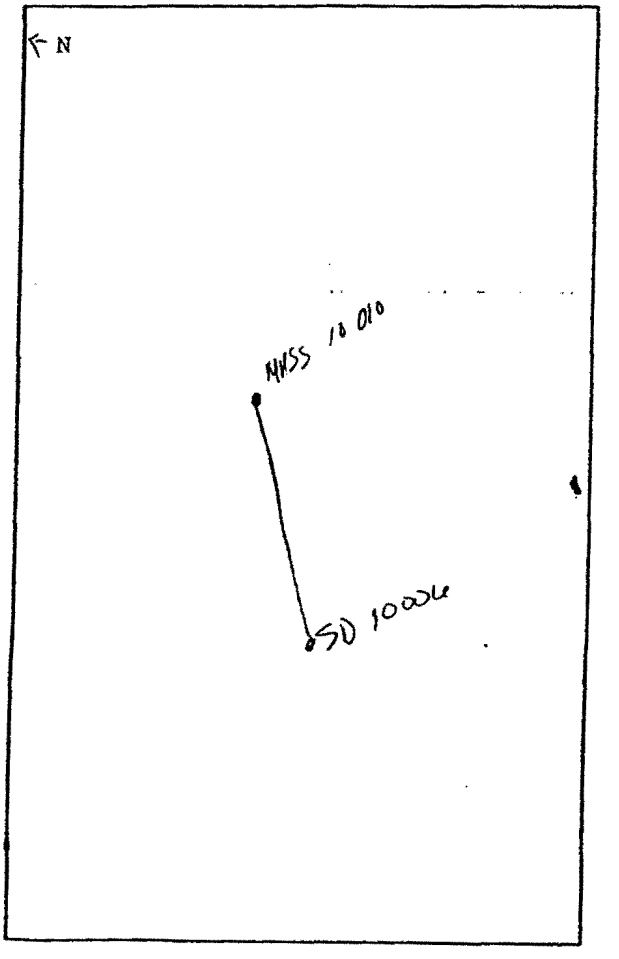
Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: MHSS 10 010	NA				
MH #2: SD 10 006	15.0'	.6ppm	20% LEL 0		Dam hole - 1.0 ppm
MH #3:					
MH #4:					
MH #5:					
MH #6:					
MH #7:					

NOTES final

(Identify AOC, problem, footage, tape count, additional lines, etc.)

Camera is under water & line was full of debris. We couldn't go any farther (Heavy Debris)

SKETCH



SB43
63

ICF KAISER ENGINEERS
Sewer Video Inspection Form

Date: 8/9/94 **Time:** 2:15
Contractor: Advanced Companies **Operator:** Arnie Huber

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: EE1000B SN-037 S. BAKER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PU4924 SNA 95/1021

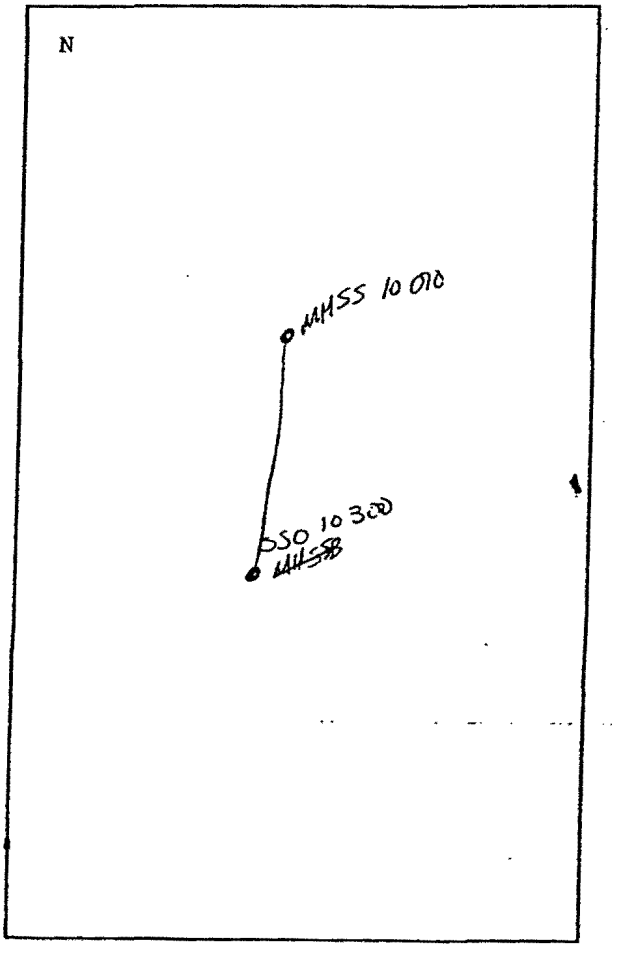
Tape #: Tape 5
Begining Tape Count: 1472
Ending Tape Count: 1511

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: SSO 10 300	NA	.6ppm	20%	NA	
MH #2: MHSS 10 010	19.0'		LEL 0		
MH #3:					
MH #4:					
MH #5:					
MH #6:					
MH #7:					

NOTES total 19.0'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

SKETCH



SB 45
604

ICF KAISER ENGINEERS
Sewer Video Inspection Form

Date: 8/9/94 **Time:** ~~2:15~~ @ 2:30
Contractor: Advanced Companies **Operator:** Arnie Huber

Video Camera Manufacturer: Ariss
Video Camera Model #, Serial #: EE1000 B SN-037 S. BAXTER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PV 4924 SN A9511021

Tape #: Tape 5
Begining Tape Count: 1311
Ending Tape Count: ~~SB 1000~~ 1710

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: SD 10007	NA	.6 ppm	2082	NA	
MH #2: MHSS 10002	98.0'		LELO		
MH #3: SD 10006	9.3'	.6 ppm	2082	NA	
MH #4:			LELO		
MH #5:					
MH #6:					
MH #7:					

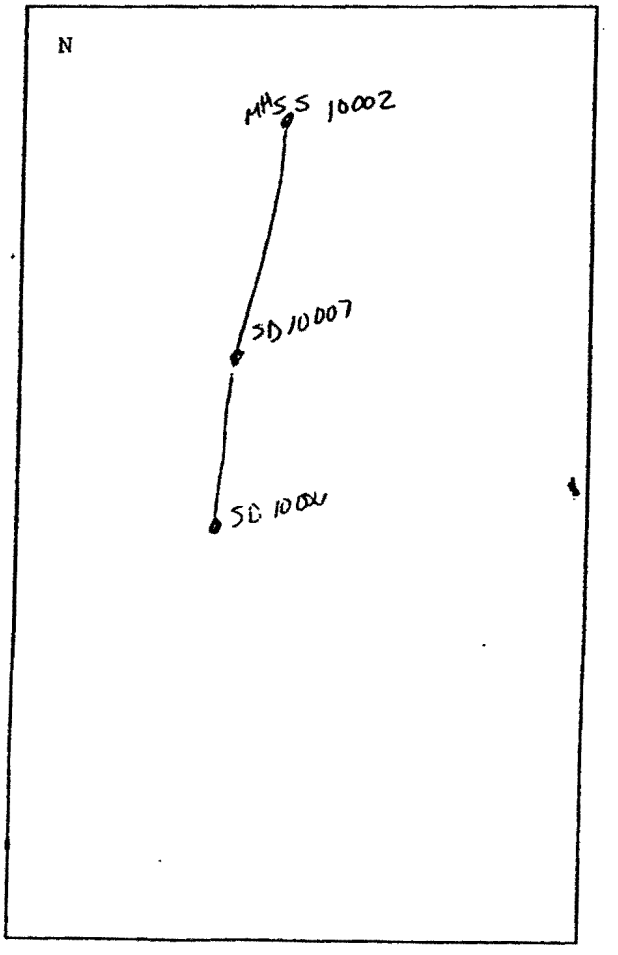
NOTES total 108.3'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

SD 10007 to MHSS 10002:
20.0' offset joint
25.0' crack (9:00-4:00)
35.0' circular crack
40.0' offset joint
49.0' possible broken joint or offset
60.0' offset joint
85.0' possible venture joint
95.0 possible leaking joint
circular crack at manhole.

MHSS 10002 SB to SD 10006:
110' cracks at 12:00
continue down to manhole
couldn't video any further due to heavy debris in the line

SKETCH



SB 48
65

ICF KAISER ENGINEERS
Sewer Video Inspection Form

Date: 8/9/94 **Time:** 3:35
Contractor: Advanced Companies **Operator:** Arnie Huber

Video Camera Manufacturer: Ariel
Video Camera Model #, Serial #: EE 1000 B SN 037 S. BAKER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PV 4924 SN A9511024

Tape #: Tape 5
Begining Tape Count: 1760
Ending Tape Count: 1783

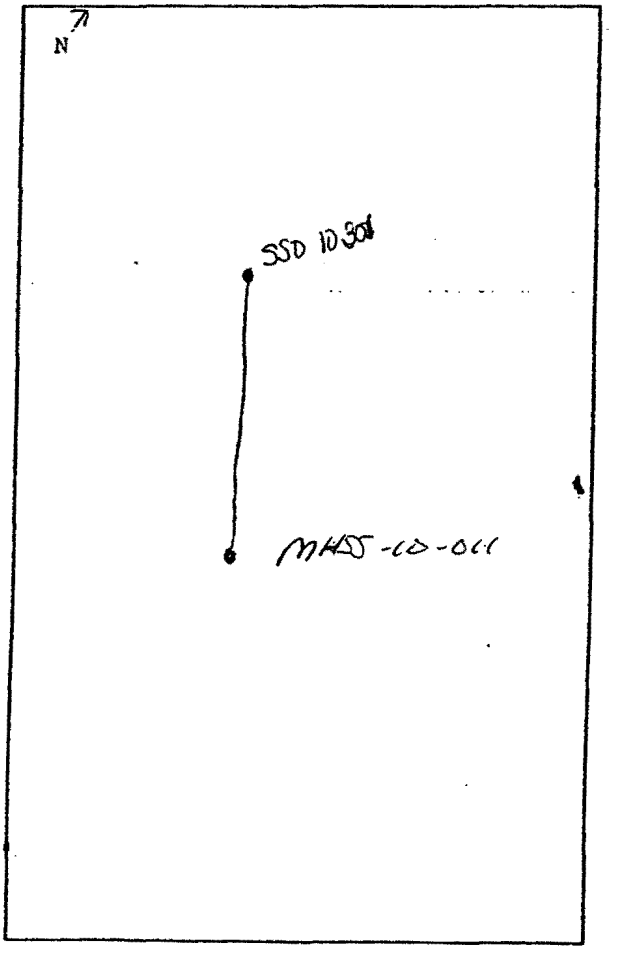
Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: SSD 10 30b	NA	.6ppm	20.8%	NA	
MH #2: MHS-10-011	26.0'				
MH #3:					
MH #4:					
MH #5:					
MH #6:					
MH #7:					

NOTES

(Identify AOC, problem, footage, tape count, additional lines, etc.)

260' Boundrop in middle of pipe.

SKETCH



ICF KAISER ENGINEERS

Sewer Video Inspection Form

Date: 8/10/94 Time: 8:30

Contractor: Advanced Companies Operator: Arnie Huber

Video Camera Manufacturer: Aries

Video Camera Model #, Serial #: SE 1000 B SN 037 S. BAYER

Manufacture of VCR: Panasonic

VCR Model #, Serial #: PU4924 SN A9511021

Tape #: Tape 5

Begining Tape Count: 1783

Ending Tape Count: ~~1889~~ ~~1889~~ 2054

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: SD 05009	NA	.8ppm	20.8%	NA	
MH #2: MHSS 05006	65.0'		LELO		
MH #3: HW 05103	5.5'	.8ppm	20.8%	NA	
MH #4: SD 05007	416.0'		LELO		
MH #5:					
MH #6:					
MH #7:					

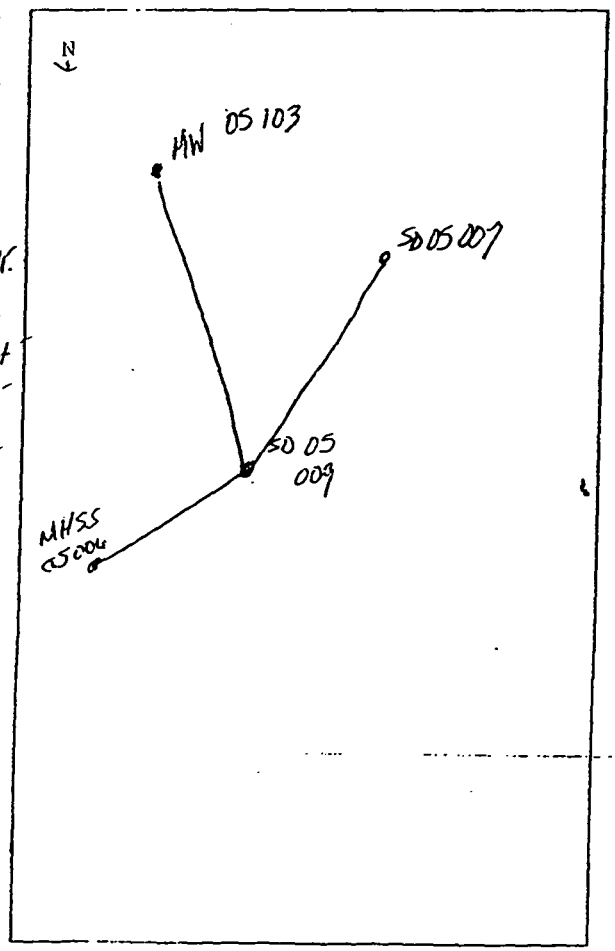
NOTES total - 116.5'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

SD 05009 to MHSS 05006:
- 30' changed pipe to VCP
- 56.0' crack (6:00-4:00)
- 60.0' off set joint

SD 05009 to HW 05103:
- 0.0' separated pipe
- Very dirty line. Could not video any farther.
- 6.1' crack (9:00-3:00)
- 40' crack 6:00 continues till next joint
- 29.0' cracked pipe (1:00-3:00) calcium deposits
- 416.0' crack at end of manhole (7:00)

SKETCH



ICF KAISER ENGINEERS
Sewer Video Inspection Form

Date: 8/10/94 Time: 9:05
Contractor: Advanced Companies Operator: Arnie Huber

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: EE1000B SN 037 S. BAKER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PD4004 SN A9511021

Tape #: Tape 5
Begining Tape Count: ~~1789~~ 2054
Ending Tape Count: 2151

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: MHSS 05005	NA	.8ppm	2088		* There is an extra line
MH #2: WD Bldg.	45.0'		LEL 0		in the field not shown on the
MH #3: MHSS 05000	46.0'	.8ppm	2088		map. One is near the top of the MH
MH #4:			LEL 0		and the other is near the
MH #5:					bottom of the MH. The top line will
MH #6:					be labeled WD 1 and the bottom
MH #7:					line will be labeled WD 2.

* The bottom line is just a drop.

NOTES total 91.0'

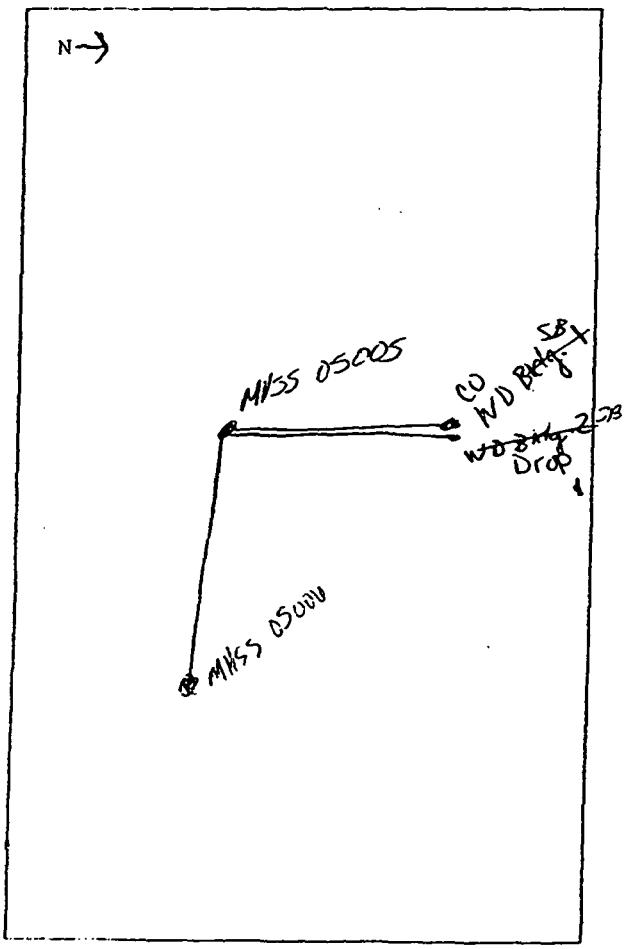
(Identify AOC, problem, footage, tape count, additional lines, etc.)

MHSS 05005 to 0.0 WD Bldg

3.0' crack (8:00 5:00) pieces missing in bottom.
Pipe looks like it gets smaller from 12" to 10" pipe
18.0' ~~crack~~ crushed pipe
45.0' clean out is straight ahead pipe y's off to the left.

9.0' service connection (left)
14.0' possible leaky joint
16.0' leaky joint
line was full of rocks and debris
could not video any further.

SKETCH



ICF KAISER ENGINEERS

Sewer Video Inspection Form

Date: 8/10/94 Time: 9:40

Contractor: Advanced Compass Operator: Arnie Huber

Video Camera Manufacturer: Aries

Video Camera Model #, Serial #: EE 1000B SN-037 S. BAKER

Manufacture of VCR: Panasonic

VCR Model #, Serial #: PU4904 SNA9S11021

Tape #: Tape 5

Begining Tape Count: 2151

Ending Tape Count: 2385

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: SD 05001	NA	.8ppm	2082	NA	Dhole .8ppm
MH #2: outfall 05400	218.0'		LEL 0		
MH #3: SD05002	43.5	.8ppm	2082	NA	Dhole .8ppm
MH #4: Bldg. 56	43.0		LEL 0		
MH #5:					
MH #6:					
MH #7:					

NOTES total 304.5'

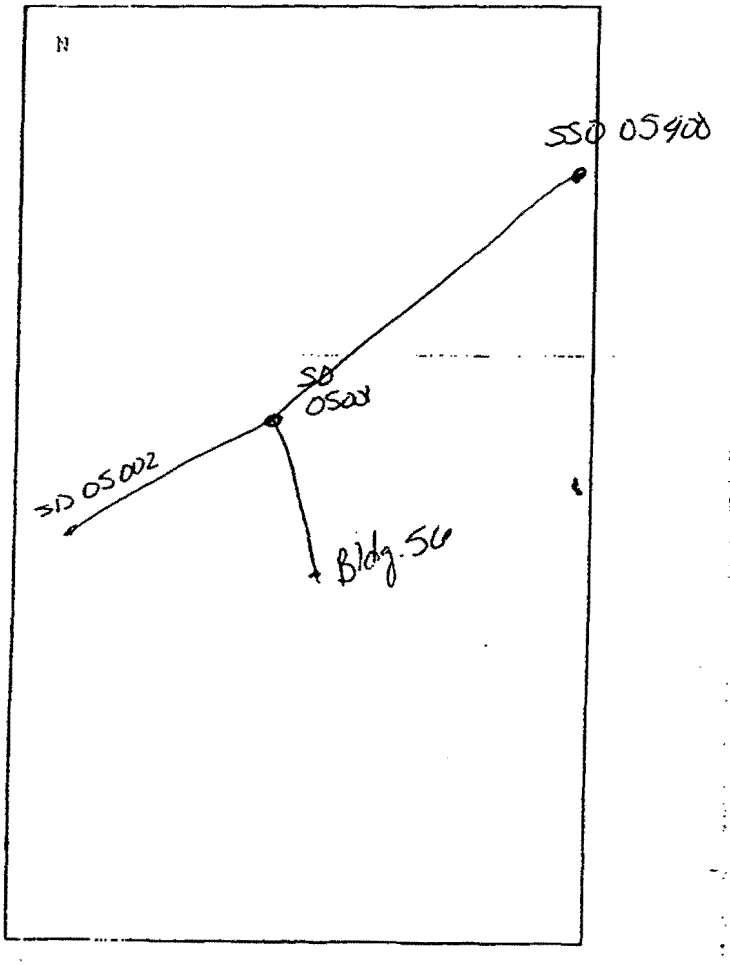
(Identify AOC, problem, footage, tape count, additional lines, etc.)

SD 05001 to SD 05400:
- 22.0' leaky joint
- 40.0' leaky joint
- 49.0' open joint

SD 05001 to SD 05002:
- Could only go 43.5' rocks and debris in line.

SD 05001 to bldg 56:
- Beginning of pipe is cracked
- 19.0' leaky joint.
- 20.0' repair pipe (ductile iron)
- 33.0' service connection (left)
- 43.0' cleanout

SKETCH



ICF KAISER ENGINEERS

Sewer Video Inspection Form

Date: 8/10/94 Time: 10:30

Contractor: Advanced Companies Operator: Arnie Huber

Video Camera Manufacturer: Aries

Video Camera Model #, Serial #: EE1000-B SN-037 S. BARTER

Manufacture of VCR: Panasonic

VCR Model #, Serial #: PU4924 SN A951/021

Tape #: Tape 5

Begining Tape Count: 2385

Ending Tape Count: 2509

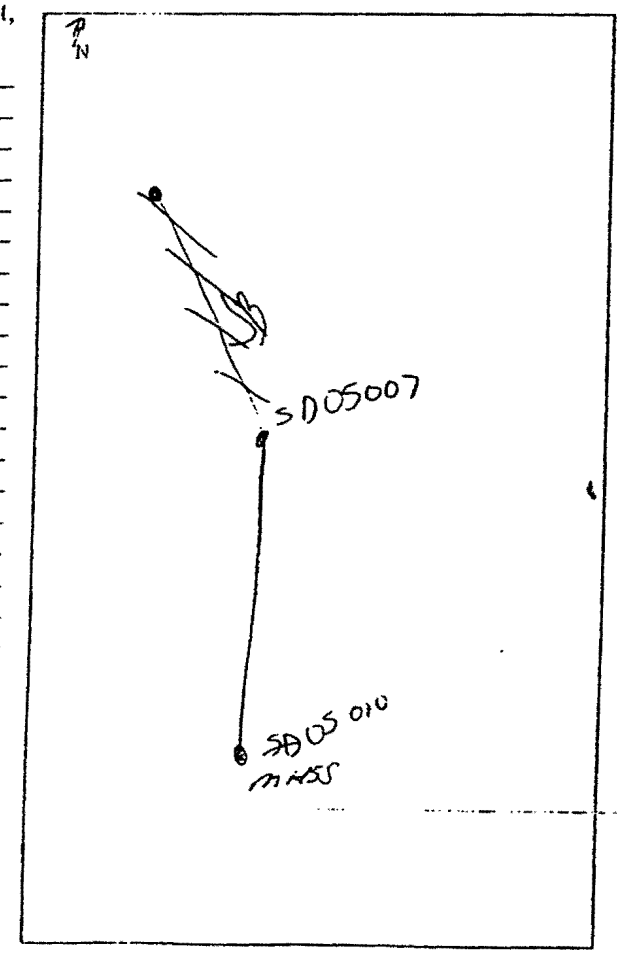
Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: SD05007	NA	.8PPM	2082	—	D-hole - 1.0 PPM
MH #2: SD05010	80'	—	LEL 0	NA	
MH #3: MISS					
MH #4:					
MH #5:					
MH #6:					
MH #7:					

NOTES total 80.0'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

10.0' offset joint
17.0' offset joint
20.0' crack (4:00)
22.0' crack (10:00)
29.0' offset joint
35.0' lateral joint
40.0' offset joint
48.0' offset joint
60.0' crack (10:00)
65.0' offset joint
72.0' slipped O ring where pipe changes to PVC leaking
77.0' Drop

SKETCH



ICF KAISER ENGINEERS
Sewer Video Inspection Form

Date: 8/10/94 Time: 12:25
Contractor: Advanced Companies Operator: Arne Hulen

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: EZ 1000B SN - 037 S. BAXTER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PV4924 SN A9S/[illegible]

Tape #: Tape 5
Begining Tape Count: 2504
Ending Tape Count: 2870

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: SD 09005	NA	.8ppm	20.8%	NA	Dirty - 1.0ppm
MH #2: SD 09004	516.0'		LEL-0		
MH #3: SD 08007	~~92.0~~ 94.0'				
MH #4: SD 08008	139.0'	.8ppm	20.8%	NA	
MH #5: SD 08009	46.0		LEL-0		
MH #6:					
MH #7:					

NOTES total 335 ~~765.0~~

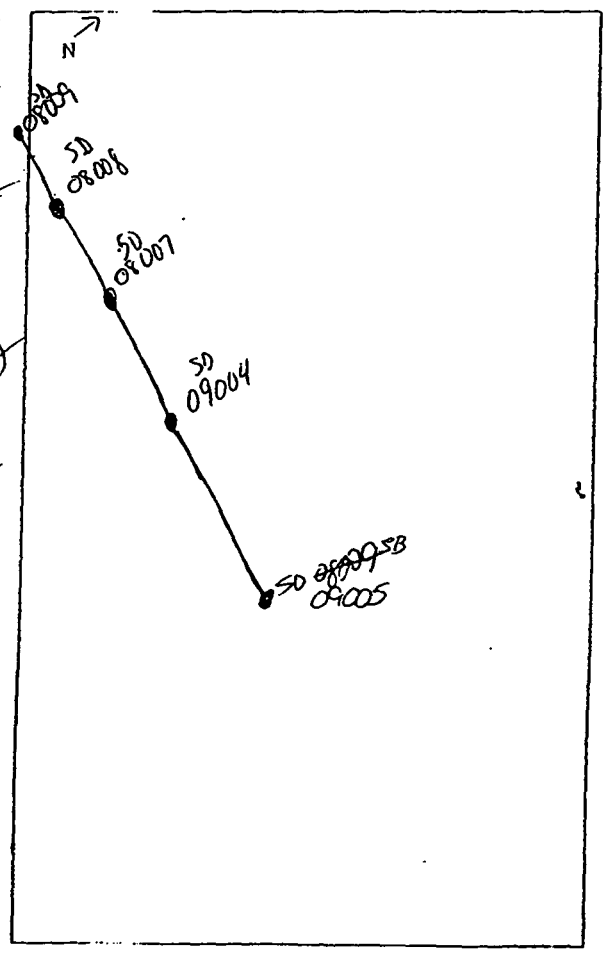
SKETCH

(Identify AOC, problem, footage, tape count, additional lines, etc.)

SD 09005 to SD 09004 / SD 08007 to SD 08008
- 316.0' offset joint
- pipe was in good condition

SD 08007 to SD 08008
- 4.0' possible circular cracks (1:00-4:00)
- 25.0' offset joint
- 43.0' possible circular cracks.
- 114.0' possible crack (1:00-4:00)
- 96.0' offset joint
- 102.0' circular cracks (Continue down line)
- 119.0' offset joint

SD 08008 to SD 08007
- 5.0' offset joint
- 25.0' circular crack → possible service lateral



ICF KAISER ENGINEERS
Sewer Video Inspection Form

Date: 8/10/94 Time: 12:30
Contractor: Advanced Companies Operator: Arnie Hubel

Video Camera Manufacturer: Axis
Video Camera Model #, Serial #: EE-1000B SN-037 S. BAXTER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PV 4924 SNA 951/021

Tape #: Tape 5
Begining Tape Count: 2870
Ending Tape Count: 3033

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: SD 08009	NA	.8ppm	2082	NA	
MH #2: SSO 08105	29.0'		LEL 0		
MH #3: ~~Bldg C05 SD08100?~~	4.0'				
MH #4:					
MH #5:					
MH #6:					
MH #7:					

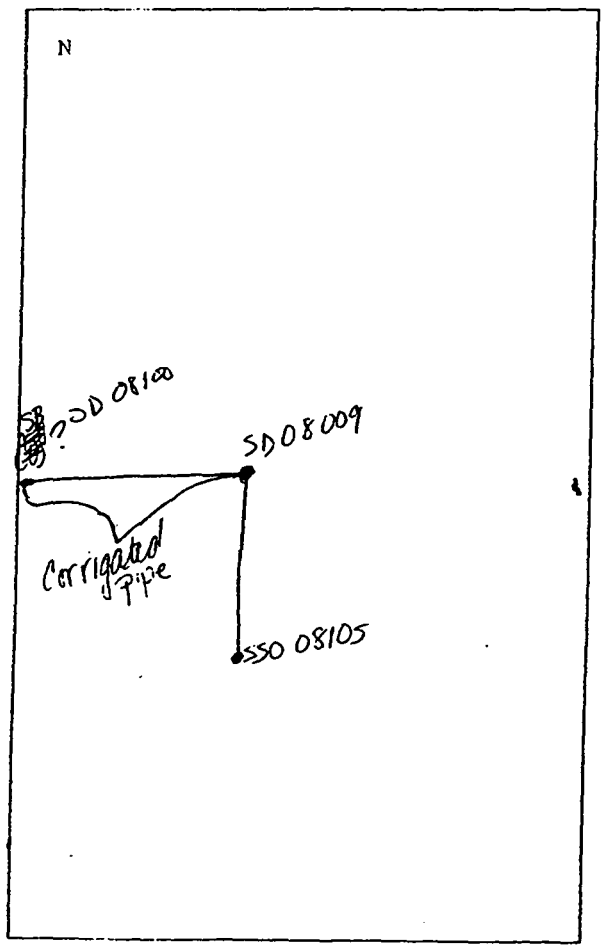
NOTES total 33.0'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

SD08009 to SSO 08105:
- 8.0' open joint & possible crack
- 11.0' possible service connection (11.00)
- Sediment build up on right side
- 29.0' protruding object in top of pipe (possible fence post)
- Could not video any further; line was full of debris

SD 08009 to SD08100?:
- Could only go 4.0' due to heavy debris

SKETCH



ICF KAISER ENGINEERS
Sewer Video Inspection Form

Date: 8/10/94 Time: 2:00
Contractor: Advanced Computer Operator: Arnie Huber

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: SE 1000B SN 037 S. BARTER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PV 9934 SN A9511021

Tape #: Tape 5
Begining Tape Count: 3033
Ending Tape Count: 3082

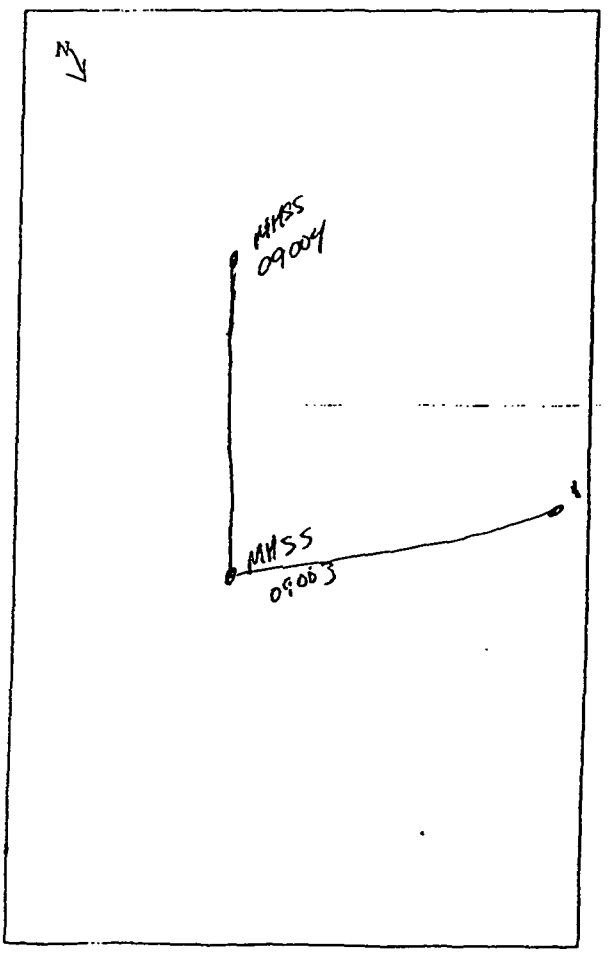
Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: MHSS 09003	NA			NA	
MH #2: MHSS 09004	45.0'	.8ppm	2082		
MH #3:			LEL 0		Dhole - .8ppm
MH #4:					
MH #5:					
MH #6:					
MH #7:					

NOTES Total 45.0'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

MHSS 09003 to MHSS 09004
13.0' possible leak (12:00)
45.0' bend in pipe
pipe is in fairly good condition

SKETCH



ICF KAISER ENGINEERS
Sewer Video Inspection Form

Date: 8/10/94 Time: 2:10
Contractor: Advanced Companies Operator: Arne Nuber

S. BAKER

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: EE 1000 B SN-037

Manufacture of VCR: Panasonic
VCR Model #, Serial #: DV 4924 SN A9511021

Tape #: Tape 5
Begining Tape Count: 3082
Ending Tape Count: ~~SB 3112 3939~~ SB 3425

Line ID by Manhole:		FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1:	MSS 08006	NA	.8ppm	208%	NA	Drain .8ppm
MH #2:	MSS 09003	38.0'		Zero		
MH #3:	PBldg	170.0'	.8ppm	208%	NA	Drain .8ppm
MH #4:	BBldg	82.0'				
MH #5:						
MH #6:						
MH #7:						

NOTES Total ~~38.0~~ SB ~~208.0~~ SB 290.0'

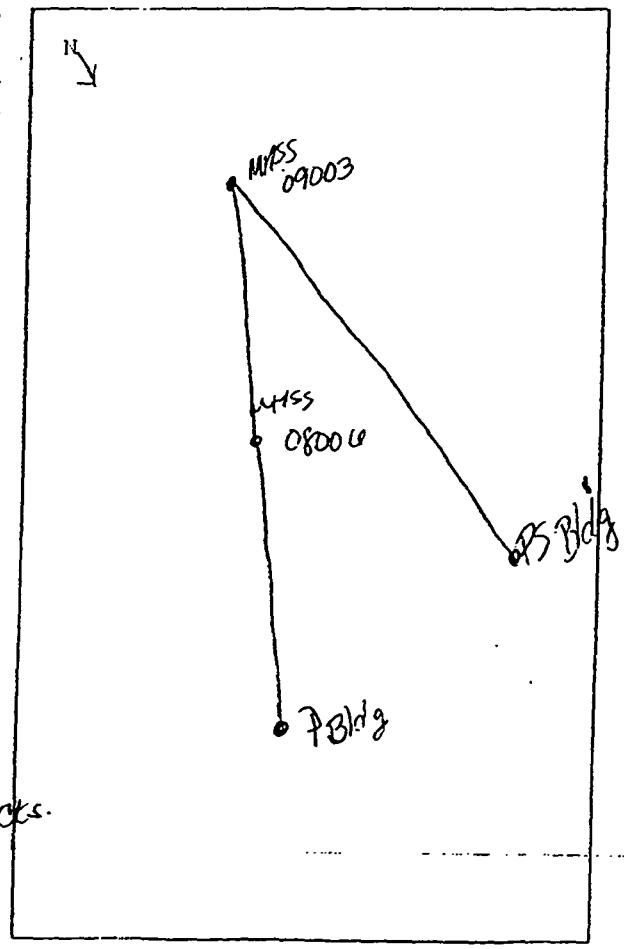
(Identify AOC, problem, footage, tape count, additional lines, etc.)

MSS 08006 to MSS 09003
32.0' Cracked pipe (1:00) at end of manhole.
pipe was in fairly good condition

11.0' cracked pipe 11.0'
13.0' off set joint
18.0' crack (5:00 & 9:00)
23.0' crack (2:00)
30.0' crack (10:00 moves to 12:00)
35.0' off set joint possible leaky
large crack in bottom goes to other joint
many surface cracks
39.0' Bad off set joint
41.0' Another bad off set joint
45.0' seperated joint many cracks on top of pipe
50.0' Belly in pipe
59.0' off set joint
61.0' crack in bottom of pipe near joint. off set joint possible leaky joint
68.0' circular crack
70. crack at 7:00 several circular cracks.
75.0' crack at (6:00)
80.0' Chipped pipe (9:00-11:00
95.0 off set joint

(over)

SKETCH



ICF KAISER ENGINEERS

Sewer Video Inspection Form

Date: 8/10/94 Time: 4:00

Contractor: Advanced Companies Operator: Arnie Huber

S. BAKER

Video Camera Manufacturer: Axis

Video Camera Model #, Serial #: EE 1000B SN-037

Manufacture of VCR: Panasonic 9511021

VCR Model #, Serial #: PU 4924 SN ~~9510~~

Tape #: Tape 5

Begining Tape Count: ~~5B 3339~~ ~~34~~ 5B 4087

Ending Tape Count: 4113

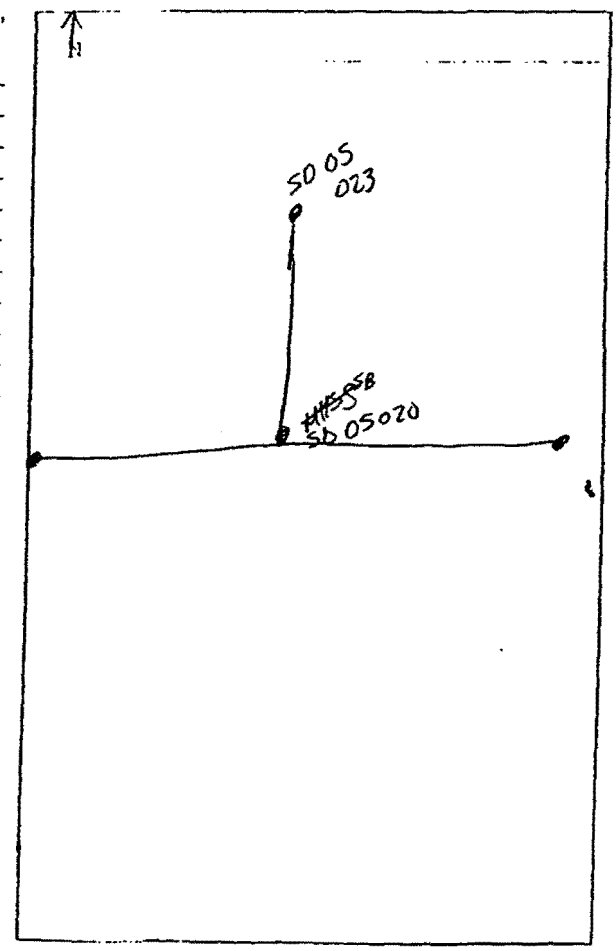
Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: SD05020	NA				
MH #2: SD05023	55.0'	.8ppm	20% LEL	NA	Dhobe - .8ppm
MH #3:					
MH #4:					
MH #5:					
MH #6:					
MH #7:					

NOTES

(Identify AOC, problem, footage, tape count, additional lines, etc.)

SD05020 to SD05023 pipe was in good condition

SKETCH



ICF KAISER ENGINEERS
Sewer Video Inspection Form

Date: 8/10/94 Time: 3:30
Contractor: Advanced Companies Operator: Annie Huber

Video Camera Manufacturer: Ariis
Video Camera Model #, Serial #: EE1000B SN 037 S. BAKER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PV4924 SN A951102

Tape #: Tape 5
Begining Tape Count: 3115
Ending Tape Count: 4089

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: MHSS 05010	NA				
MH #2: SD 05022	67.0'	.8pm 2088	LSC 0		D hole .8pm
MH #3: SD 05023	125.0	.8pm 2032	LSC 0		
MH #4:					
MH #5:					
MH #6:					
MH #7:					

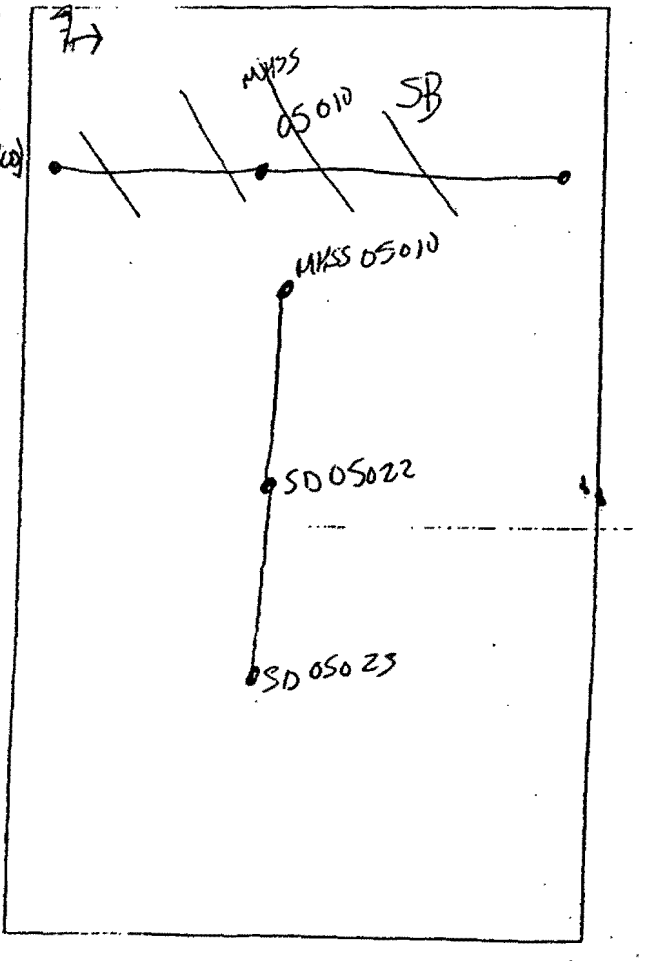
NOTES total · 192.0'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

MHSS 05010 to SD 05022:
- 15.0' crack (9:00)
- 20.0' crack (3:00 & 12:00)
- 34.0 circular crack
- 42.0 off set joint also crack (8:00 & 11:00-7:00)
- 50.0' off set joint
- 55.0' crack (12:00-8:00 & 9:00)

SD 05022 to SD 05023:
- 25.0' off set joint
- 50.0 off set joint
- 14.0' off set joint

SKETCH



KAISER ENGINEERS
Sewer Video Inspection Form

Date: 8/11/94 Time: 8:30
Contractor: Advanced Companies Operator: Arnie Huber.

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: EE 1000 B SN - 037 S. BAKER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PV 4924 SN A951021

Tape #: Tape 5
Begining Tape Count: 4113
Ending Tape Count: 4198

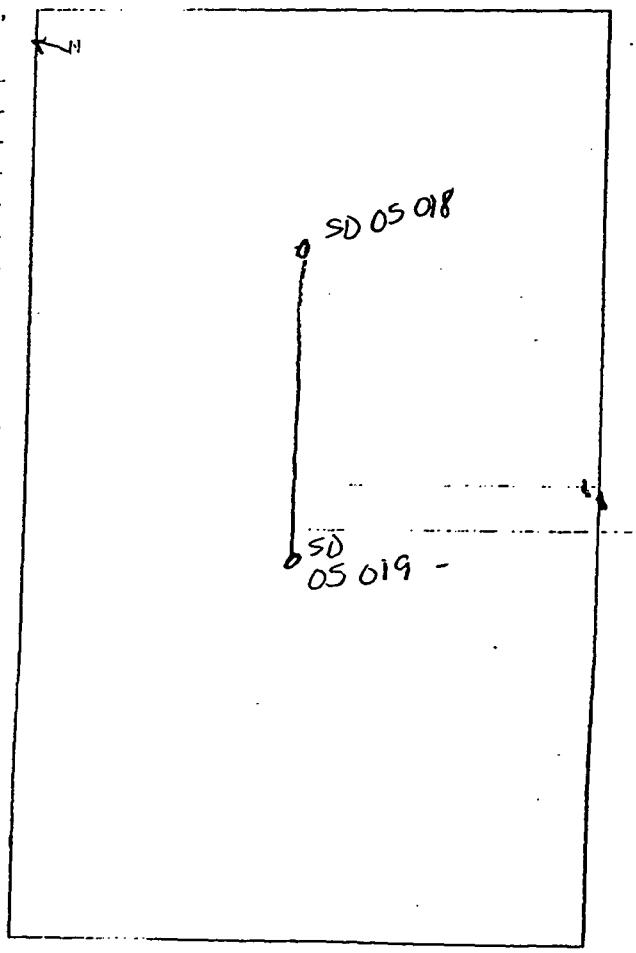
Line ID by Manhole:		FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1:	SD05019	NA			NA	*could go on farther
MH #2:	SD05018	98.0'	.8ppm	2089	LEL 0	due to sediment
MH #3:						in the line.
MH #4:						
MH #5:						
MH #6:						
MH #7:						

NOTES: total

(Identify AOC, problem, footage, tape count, additional lines, etc.)

12.0' Crack (1:00-4:00)
18.0' Belly in line
20.0' out of Belly
36.0' Crack (8:00-11:00)
40.0 Crack (1:00-4:00 & 12:00)
49.0 many cracks downline until about 60.0' they are in different areas of the pipe
76.0' Crack (12:00)
86.0' Crack (3:00-11:00-7:00)
89.0 Belly in line
98.0' Cracks out of Belly *about 5.0'-10.0' from manhole.

SKETCH



KAISER ENGINEERS
Sewer Video Inspection Form

Date: 8/11/94 Time: 9:15
Contractor: Advanced Companies Operator: Arnie Huber

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: EE 1000 B SN- 037 S. BAKER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: AV 4924 SN A9511021

Tape #: Tape 5
Begining Tape Count: 4198
Ending Tape Count: 4288

Line ID by Manh.	Footage	HnU	CGI	Other	COMMENTS
MH #1: MHSS 01011	NA	.8ppm	20.8%	NA	* could not video line is very dirty.
MH #2: SD01009	0'		LEL 0		
MH #3: DD01012	67.0'	.8ppm	20.8%	NA	
MH #4: MHSS 02 ~~8~~102	0'		LEL 0		* can't video could not get camera in line.
MH #5:					
MH #6: SD01012	NA		LEL 0		
MH #7: SD01013	17.0'	.8ppm	20.8%	NA	

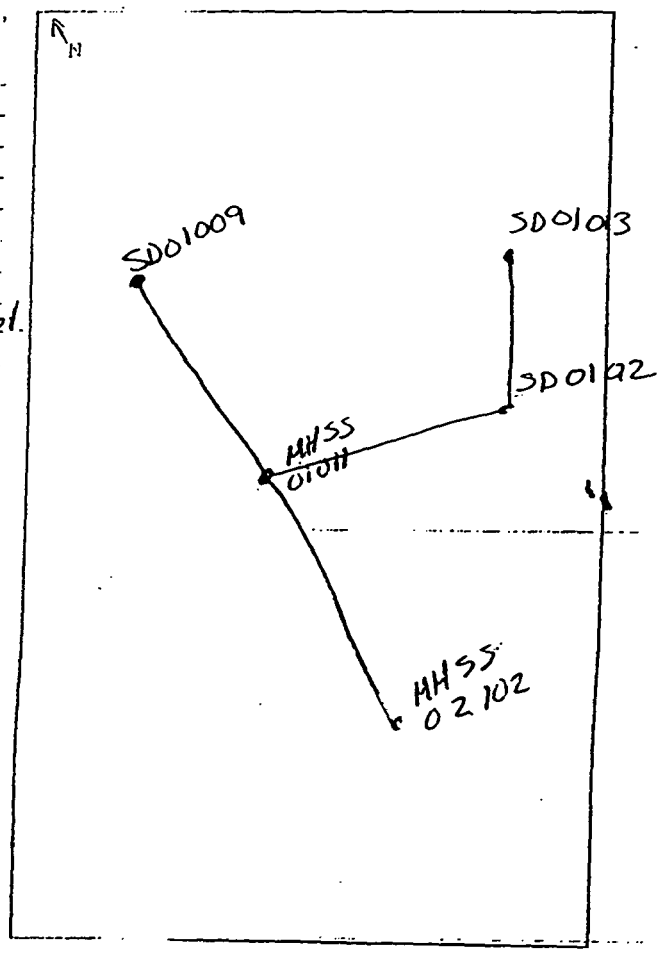
NOTE: total

(Identify AOC, problem, footage, tape count, additional lines, etc.)

MHSS01011 to DD01012:
210' cracked pipe (1:00)
33.0' crack at 5:00 continues
till about 38.0'
38.0' Belly
40.0' came out of Belly
42.0' offset joint
66.0' Circular crack

DD01012 to SD01013:
15.0' 3rd offset. cracked around offset.
rest of pipe was in good condition

SKETCH



KAISER ENGINEERS

Sewer Video Inspection Form

78

Date: 8/11/94 Time: 9:45

Contractor: Adronad Companies Operator: Arnie Huber

Video Camera Manufacturer: Aries

Video Camera Model #, Serial #: EE 1000 B SN- 037 S. BARTER

Manufacturer: Panasonic

VCR Model #, Serial #: PV 4929 SN A9511021

Tape #: Tape 5

Begining Tape Count: 4288

Ending Tape Count: 4600

Line ID by Manhole	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: MHSS 02013	NA			NA	
MH #2: SSO 02101	650'	.8ppm	2082		DH - .8 ppm
MH #3: SD 02014	~~250'~~ 250'	.8ppm	2082	NA	
MH #4: MHSS 02016	128.0'	.8ppm	2082	NA	Dhole - .8ppm
MH #5:			LEL 0		
MH #6:					
MH #7:					

NOTE total

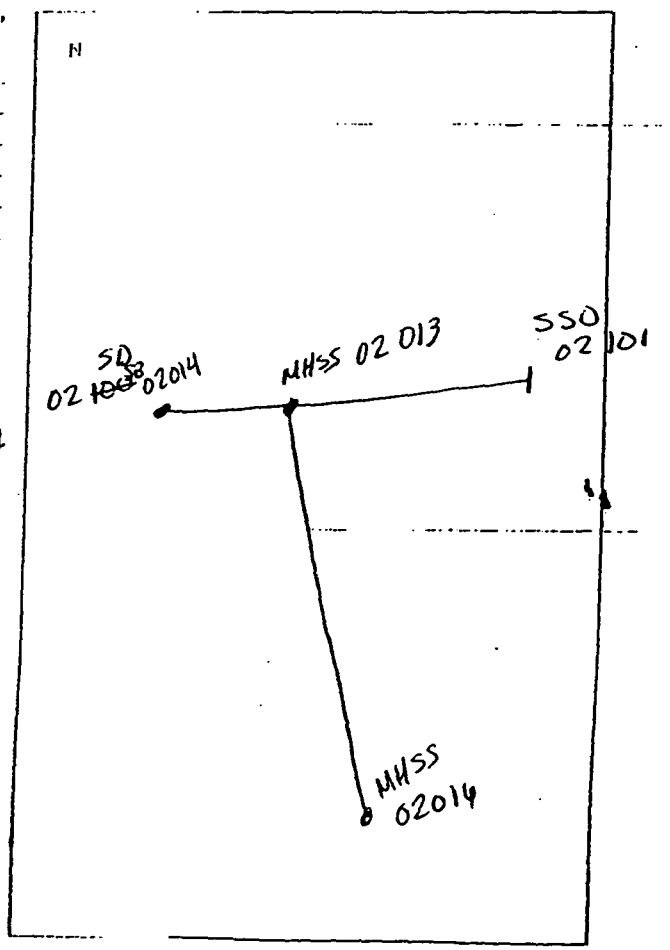
(Identify AOC, problem, footage, tape count, additional lines, etc.)

MHSS 02013 to SSO 02101
- 13.0' circular crushed pipe
- 49.0' crack at (12:00)
- 54.0' offset joint
- 63.0' weir built into pipe.

MHSS 02013 to SD 02014
- 14.0' cracked pipe (4:00)
- 16.0' crack (11:00 & 6:00) crack at 6:00 continues
- 20.0' crack (3:00 & 12:00)

MHSS 02013 to MHSS 02016
- 5.0' possible joint leakage and crack at (1:00)
- 10.0' crack 6:00 possible leaky joint
- 43.0' cracks at (3:00 & 11:00-7:00)
- 55.0' crack (8:00)
- 60.0' crack 3:00 & 11:00
- 75.0' crack 4:00 & 10:00
- 80.0' crack
- 110.0' crack (4:00 & 7:00 & 11:00)
- 121.0' crack 10:00

SKETCH



KAISER ENGINEERS
Sewer Video Inspection Form

Date: 8/11/94 Time: 9:20 to 10:20
Contractor: Advanced Companies Operator: Arnie Huber

Video Camera Manufacturer: Aries
Video Camera Model #, Serial: EE 1000B SN 037 S. BAXTER

Manufacture or Model: Panasonic
VCR Model #, Serial #: PU 4984 SN A9517021

Tape #: Tape 5
Begining Tape Count: 4600
Ending Tape Count: 4755

Line ID by Manhole	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: MHSSD2016	NA				
MH #2: SD 02015	420'	.8PP	2082	NA	
MH #3: SD 02017	66.0'		LEL 0		
MH #4:					
MH #5:					
MH #6:					
MH #7:					

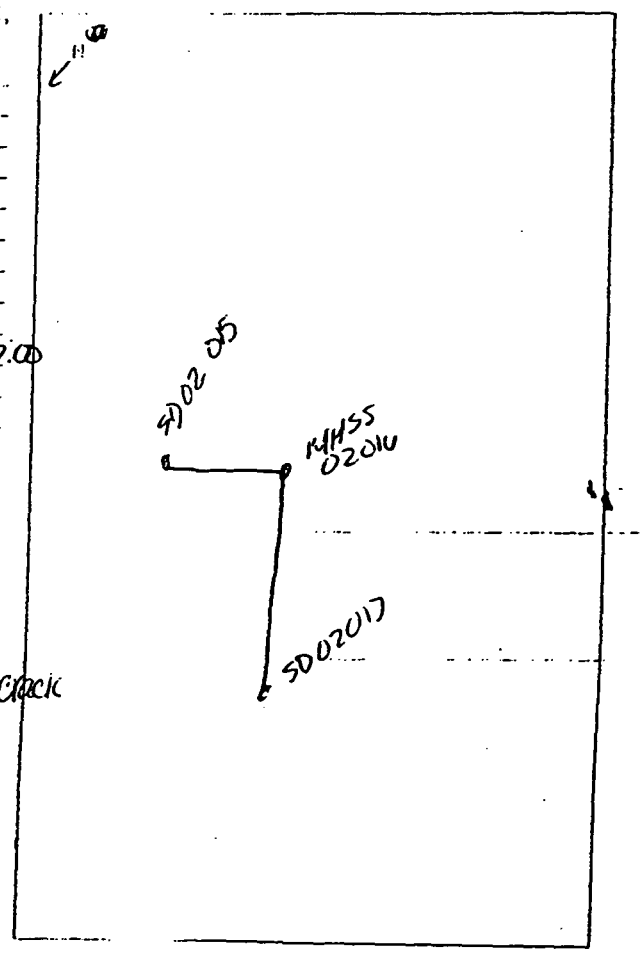
TOTAL: total

(Identify AOC, location, footage count, additional lines, etc.)

MHSS 02014 to SD 02015
- 8.0 Circular crack
- 10.0' crack at (12:00)
- 14.0 Crack (4:00)
- 16.0' possible leaky joint
- 29.0' crack (11:00)
- 31.0' crack (12:00-2:00)
- 32.0' Surface cracks
- 39.0' crack at 12:00

- 00' Circular crack and crack at 12:00
- 10.0' crack at (1:00) about 30'
- 21.0' Crack at 6:00 continues
- 28.0 possible leak @ (12:00-5:00)
- 34.0 crack (12:00)
- 40.0 crack (4:00-1:00)
- 45.0' possible leaky joint
- 46.0' crack (11:00-12:00) and surface cracks
- 54.0' crack (2:00-7:00) continues.
- 60.0' possible leaky joint
- crack at 6:00 continues into circular crack

SKETCH



KAISER ENGINEERS
Sewer Video Inspection

80

Date: 8/11/94
Contractor: Advanced Companies
Time: 10:50
Op: Arnie Huber

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: EE 1000B SN: 037
S. BAKER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: AU4929 SN A951102/

Tape #: Tape 5
Begining Tape Count: 4755
Ending Tape Count: 4992

Line ID by Manhole	FOOTAGE	Hot	CGI	Other	COMMENTS
MH #1: ~~SD MHSS 03028~~		MHSS 03 ~~SD03028~~			
MH #2: SD 02019	60.0'	SD02019			
MH #3: ~~MHSS 03024 BES~~	18.0'	MHSS 03024	.8ppm	2082 LEL 0	
MH #4: ~~MHSS 03027~~ BES	115.0'	MHSS 03027			
MH #5:	52.0'	MHSS 03026	.8ppm	2082 LEL 0.	
MH #6:					
MH #7:					

FOG total

(Identify AOC, problem, footage, tape count, additional lines, etc

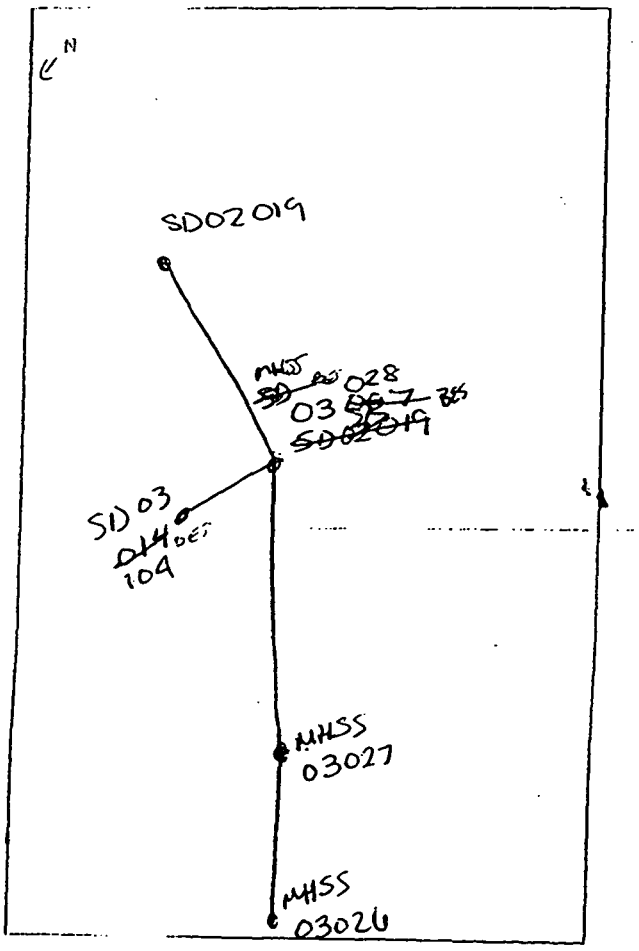
MHSS ~~SD~~ 03028 BES to SD02019
- 120' Crack (1:00-3:00)
- 140 Crack (10:00-12:00)
- 250' Crack (11:00-9:00)
- 310' possible circular crack
- 320' Crack 8:00 continues
- 560' 9:00 wet spots possible crack

MHSS ~~SD~~ 03028 BES to ~~MHSS~~ SD03 OT4DES 104
- 5.0' crack (12:00)
- 150' bad offset crack at 6:00

SD 03028 to MHSS 03027
- 15.0' crack (12:00) offset joint
- 18.0' crack (7:00)
- 30.0' crack (12:00 & 2:00)
- 60.0' crack at 9:00 and continues
- 660' crack (4:00-6:00)
- 90.0 crack at (4:00)
- 95.0' crack (3:00)
- 1010' crack (11:00 & 7:00)

MHSS 03027 to MHSS 03026
- 5.0 cracks 5:00
- Sediment built up on side (right) of line
- 27.0' crack (8-10:00) & (2:00)
- 48' crack (1:00 3:00) & surface cracks

SKETCH



MCP KAISER ENGINEERS
Sewer Video Inspection Form

Date: 8/11/94
Contractor: Advanced Companies
Time: 11:30
Operator: Marie Huber

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: SE 1000 B - SN - 037 S. BAXTER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PU 4929 SN A951102/

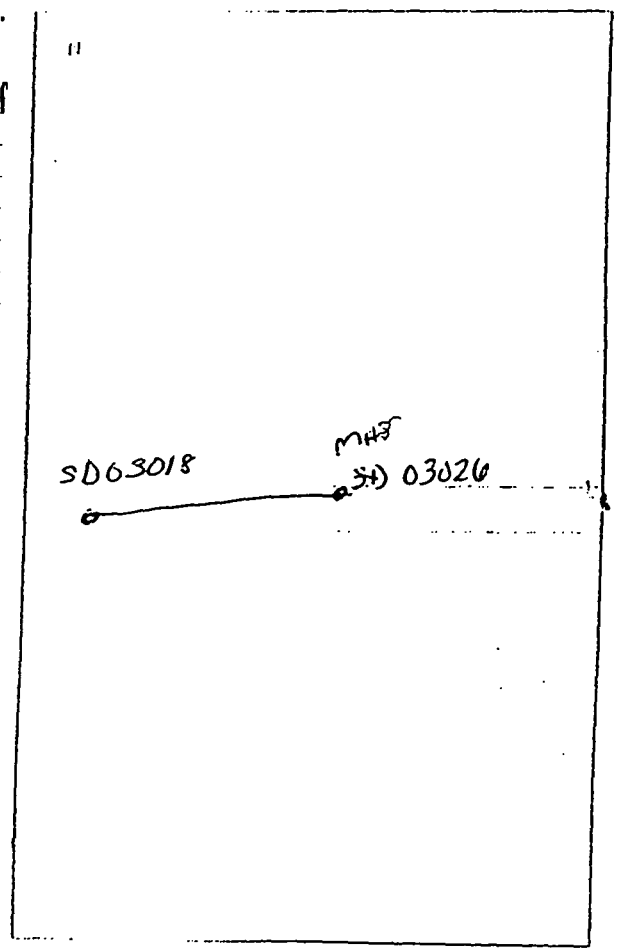
Tape #: Tape 5
Begining Tape Count: 4992
Ending Tape Count: 4992

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: SD 03026	NA				* Debris in line unable to video.
MH #2: SD 03018	5.0	.8ppm	2088		
MH #3:					
MH #4:					
MH #5:					
MH #6:					
MH #7:					

NOTES

(Identify AOC, problem, footage, tape count, additional lines, etc.)
5.0' circular crack
Could not video large amount of debris in line.

SKETCH



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KAISER ENGINEERS

Sewer Video Inspection Log

Date: 8/11/94 Time: 1:35

Contractor: Advanced Companies Operator: Arnie Huber

Video Camera Manufacturer: Aries

Video Camera Model #, Serial #: EE 10003 SN-037 S. BAXTER

Manufacture of VCR: Panasonic

VCR Model #, Serial #: PV 4929 SN A9511021

Tape #: Tape 5

Begining Tape Count: 4992

Ending Tape Count: 5099

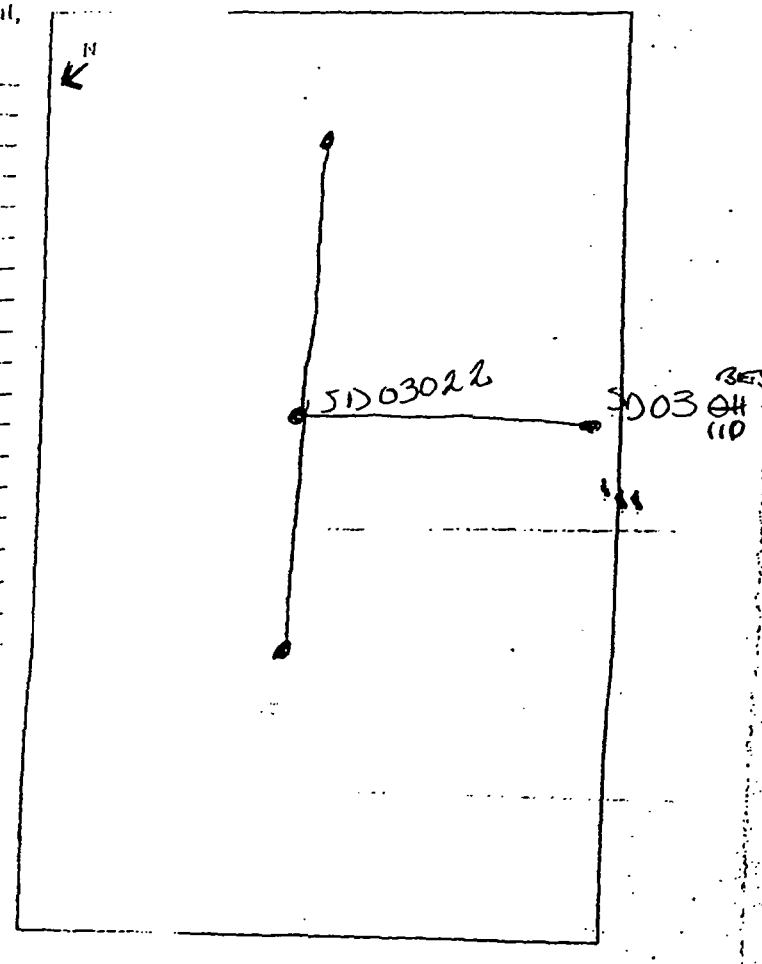
Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: SD 03022		.8pp	20.8%		
MH #2: SD 03 ~~all~~	128.0'		CGI 0		
MH #3: no					
MH #4:					
MH #5:					
MH #6:					
MH #7:					

NOTES total

(Identify AOC, problem, footage, tape count, additional lines, etc.)

110' crack at 10:00 and 12:00
114.0' off set joint
28.0' possible leaky joint
50.0' crack 11:00
90.6' off set joint
92.0' crack 10:00
98.0 crack (3:00 & 9:00)
104. crack 5:00 & off set joint
108. off set joint
116.0 leaky joint
118.0' crack (1:00 & 11:00)
124.0' possible leaky joint
129 seperated joint
heavy debris in line

SKETCH



KAISER ENGINEERS

Sewer Video Inspection Form

Date: 8/11/94 Time: 2:18

Contractor: Advanced Computers Operator: Acne Huber

Video Camera Manufacturer: Ariss

Video Camera Model #, Serial #: EX 1000 B SN-037 S. BAXTER

Manufacture of VCR: Panasonic

VCR Model #, Serial #: AV 4929 SN A951102I

Tape #: Tape 5

Begining Tape Count: 5019

Ending Tape Count: 5151

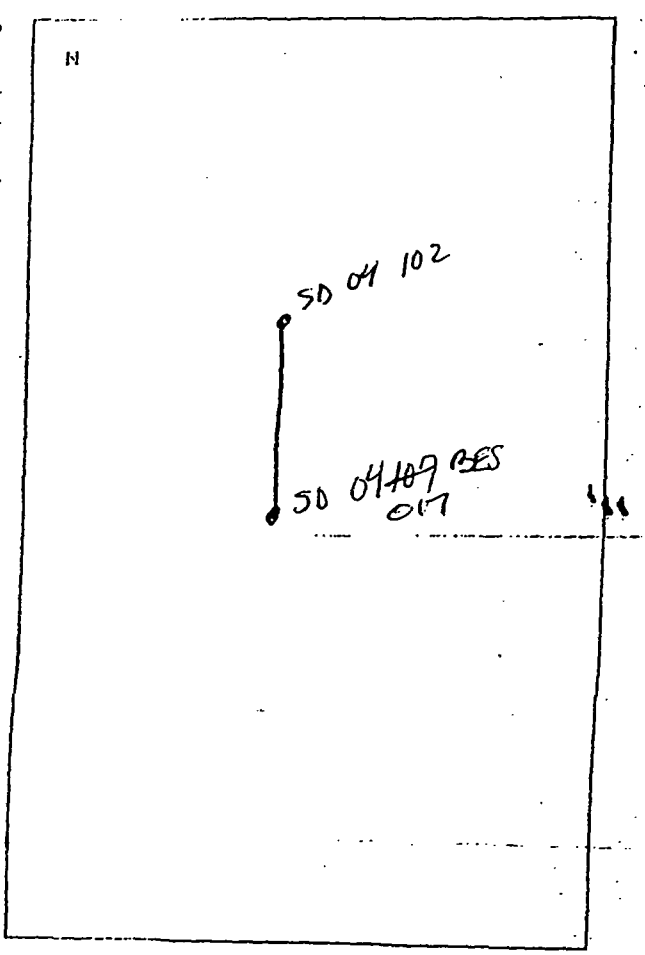
Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: SD 04102		NA	NA	NA	—
MH #2: SD 04107	134				
MH #3:					
MH #4:					
MH #5:					
MH #6:					
MH #7:					

NOTES total 134.0'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

57.0' off set joint possible leaky joint
105.0' Bend in pipe
131.0' off set joint at end of the manhole

SKETCH



KAISER ENGINEERS

Sewer Video Inspection Form

Date: 8/11/94 Time: 3:45

Contractor: Advanced Companies Operator: Arnie Huber

Video Camera Manufacturer: Aries

Video Camera Model #, Serial #: EE 1000 B SN 037 S. BAXTER

Manufacture of VCR: Panasonic

VCR Model #, Serial #: PV 4929 SN A951/021

Tape #: Tape 5

Begining Tape Count: 5151

Ending Tape Count:

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: ~~SB~~ MHSS 11 012					
MH #2: MHSS 11 011	10.0'	8ppm	20%		
MH #3: MHSS 11 013	130.0'		0		
MH #4:					
MH #5:					
MH #6:					
MH #7:					

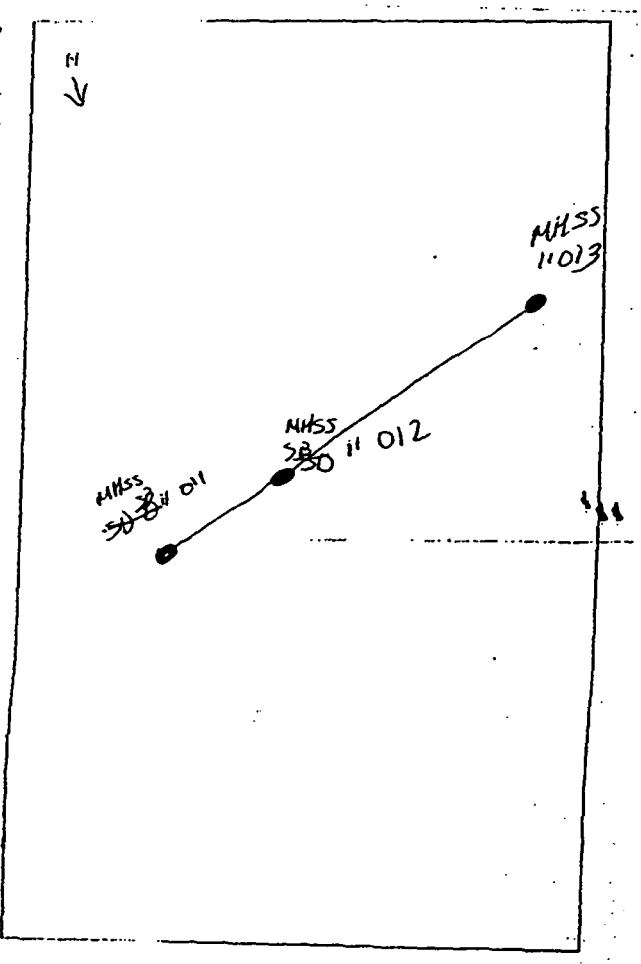
NOTES: total 140.0'

(Identify AOC, problem, footage, pipe count, additional lines, etc.)

MSS 11 012 } pipe was in good condition
MSS 11 011

36.0' surface cracks
40.0 off set joint
48.0' crack 12:00-1:00
106.0' crack at 12:00

SKETCH



KAISER ENGINEERS

Sewer Video Inspection Form

Date: 8/11/94 Time: 3:20

Contractor: Advanced Companies Operator: Arnie Huber

Video Camera Manufacturer: Ariks

Video Camera Model #, Serial #: SE 1000B SN-037 S BAKER

Manufacture of VCR: Panasonic

VCR Model #, Serial #: PV 4924 SN A951102

Tape #:

Begining Tape Count: 5307

Ending Tape Count: 5360

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: MHSS SD 11-013		.8ppm	20.8%		
MH #2: MHSS 11-015	99.0'		GEO		
MH #3:					
MH #4:					
MH #5:					
MH #6:					
MH #7:					

NOTES: total 99.0'

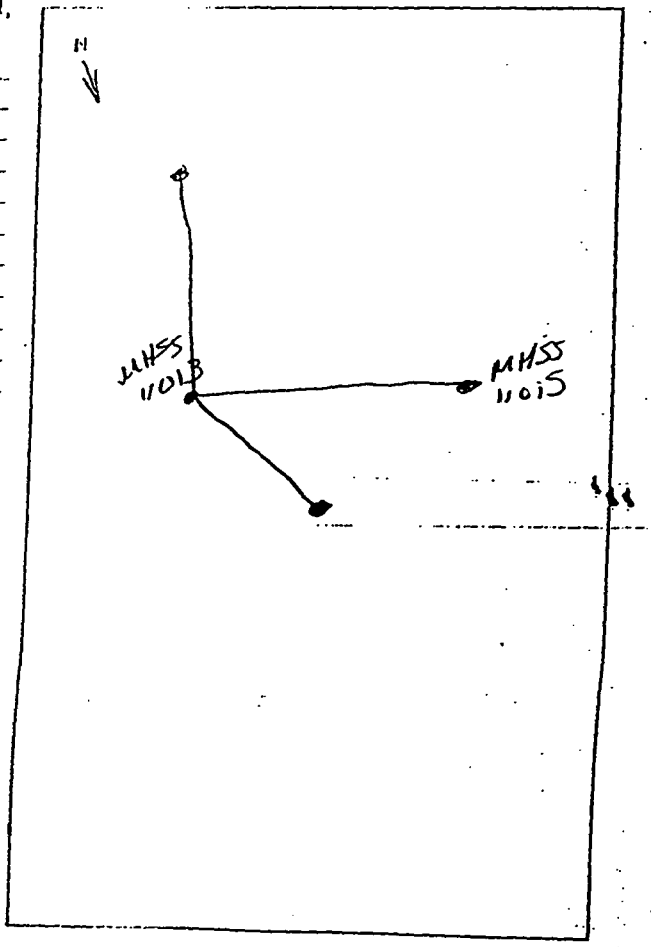
(Identify AOC, problem, footage, tape count, additional lines, etc.)

10. crack (11:00)

47.5' crack (4:00)

69.0' crack (8:00) white calcium deposits

SKETCH



846

KAISER ENGINEERS

Sewer Video Inspection Form

Date: 8/15/94 Time: 8:35

Contractor: Advanced Companies Operator: Arnie Pluber

Video Camera Manufacturer: Aries

Video Camera Model #, Serial #: EE 1000 B SN 037 S. BAXTER

Manufacture of VCR: Panasonic

VCR Model #, Serial #: PV4924 SN A9S1102/

Tape #: Tape 5

Begining Tape Count: 5360

Ending Tape Count: 5381

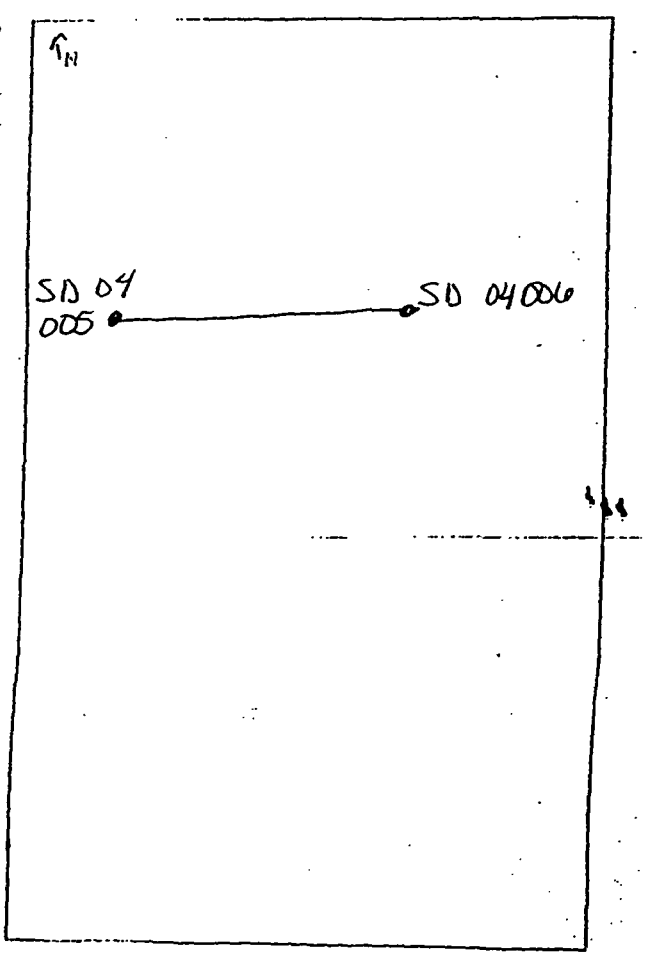
Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: SD 04006		NA	NA	NA	—
MH #2: SD 04005					
MH #3:					
MH #4:					
MH #5:					
MH #6:					
MH #7:					

NOTES

(Identify AOC, problem, footage, tape count, additional lines, etc.)

Cant video; too much debris in line

SKETCH



ICF KAISER ENGINEERS

Sewer Video Inspection Form

Date: 8/15/94 Time: 9:00

Contractor: Advanced Companies Operator: Annie Huber

Video Camera Manufacturer: Aries

Video Camera Model #, Serial #: EE 1000 B SN 037 S. BARTER

Manufacture of VCR: Panasonic

VCR Model #, Serial #: PU 4924 SN A951102/

Tape #: Tape 5

Begining Tape Count: 5381

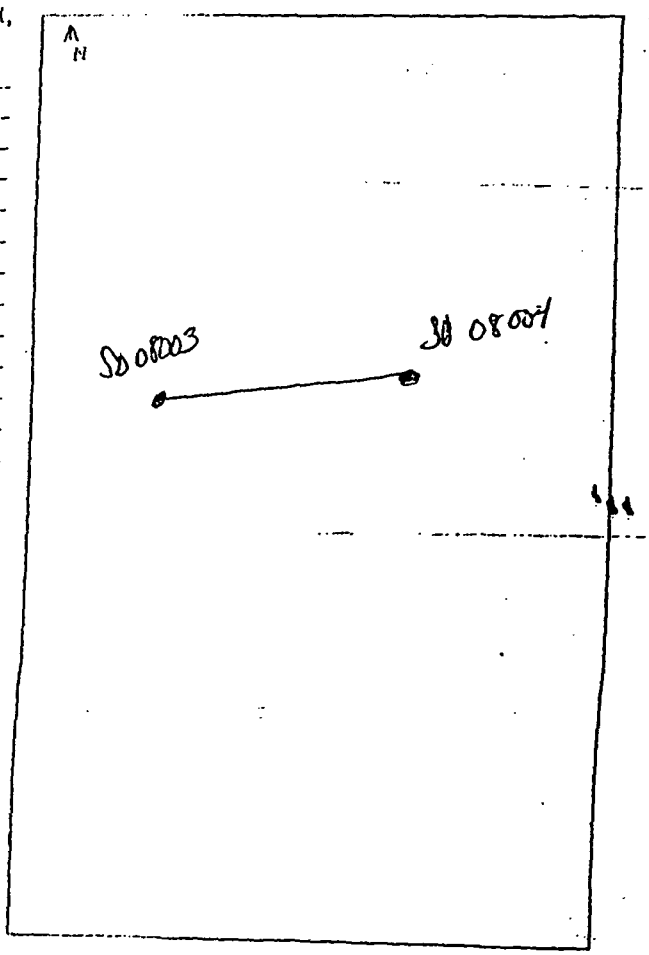
Ending Tape Count: 5381

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: SD 08003		NA	NA	NA	Can't video camera
MH #2: SD 08004					won't fit in box
MH #3:					
MH #4:					
MH #5:					
MH #6:					
MH #7:					

NOTES

(Identify AOC, problem, footage, tape count, additional lines, etc.)

SKETCH



ICF KAISER ENGINEERS
Sewer Video Inspection Form

Date: 8/15/94 Time: 9:35
Contractor: Advanced Companies Operator: Arnie Huber

Video Camera Manufacturer: Aries
Video Camera Model #, Serial #: EE 1000B SN-037 S. BAILER

Manufacture of VCR: Panasonic
VCR Model #, Serial #: PV4924 SN A9511021

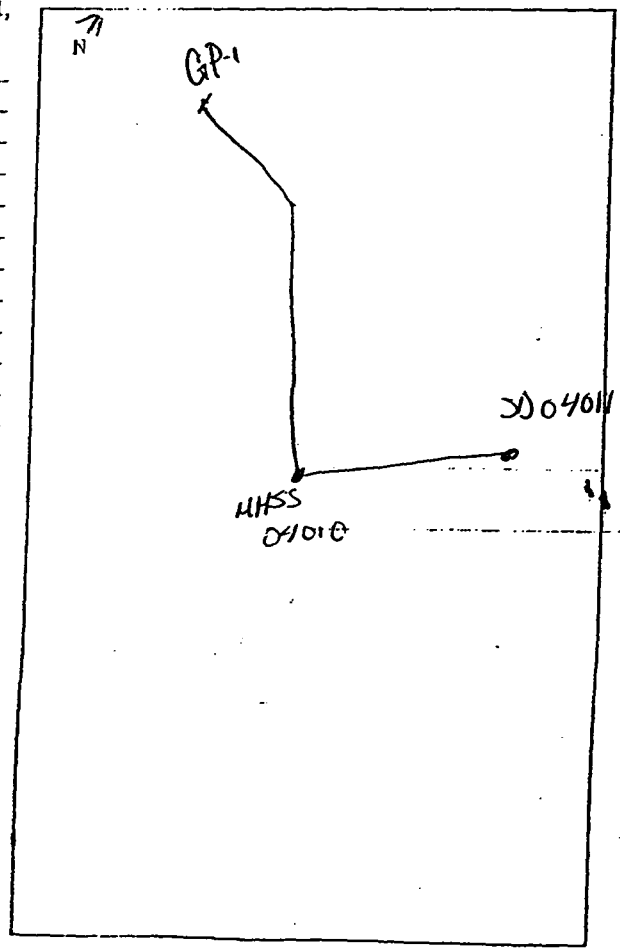
Tape #: Tape 5
Begining Tape Count: 5381
Ending Tape Count: 5465

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: SS 04 010	NA	.8ppm	20.8%	NA	Can't video too much
MH #2: SD 04 001			02-0		debris in line
MH #3: GP-1		Dtbk 1.0			* Can't video to GP-1
MH #4:					Camera will not fit
MH #5:					in line
MH #6:					
MH #7:					

NOTES

(Identify AOC, problem, footage, tape count, additional lines, etc.)

SKETCH



ICF KAISER ENGINEERS

Sewer Video Inspection Form

Date: 8/15/94 Time: 9:55

Contractor: Advanced Companies Operator: Arnie Huber

Video Camera Manufacturer: Aries

Video Camera Model #, Serial #: EE 1000 B SN · 037 S. BAXTER

Manufacture of VCR: Panasonic

VCR Model #, Serial #: PU 4924 SN A9511021

Tape #: Tape 5

Begining Tape Count: 5405

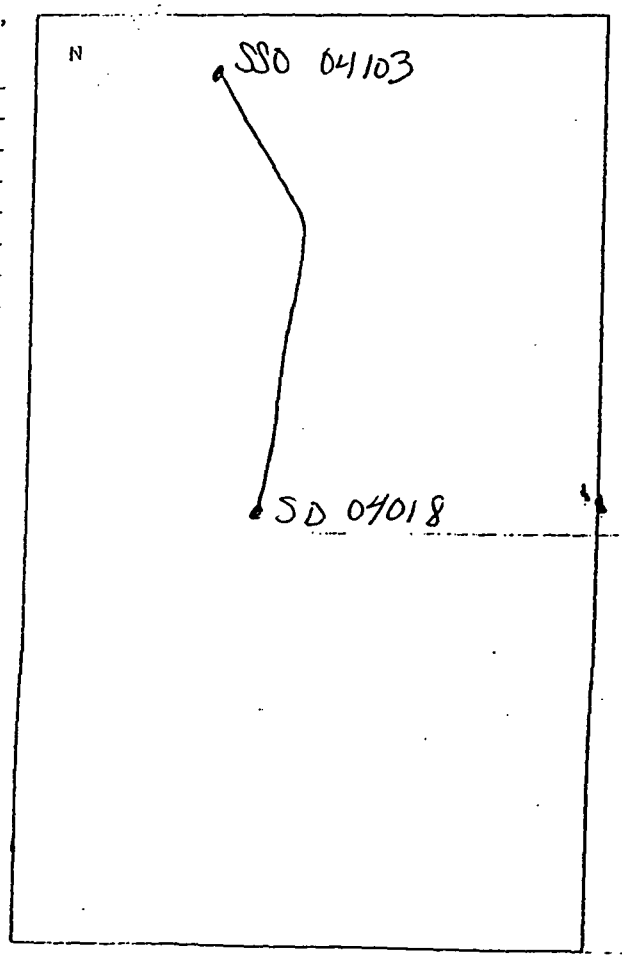
Ending Tape Count: 5426

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: SD 04018	NA	.8ppm	2082		Camera quit working
MH #2: SSO 04103	11.0'		1620		
MH #3:					
MH #4:					
MH #5:					
MH #6:					
MH #7:					

NOTES total 11.0'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

SKETCH



ICF KAISER ENGINEERS
Sewer Video Inspection Form

Date: 8-29-94 Time: 823
Contractor: ADVANCED Operator: DUKE

Video Camera Manufacturer: ARIES
Video Camera Model #, Serial #: EE 1000B SN-037 J. OLBERDING

Manufacture of VCR: PANSONIC
VCR Model #, Serial #: PU4924 SN A951102

Tape #: ~~#5~~ 6
Begining Tape Count:
Ending Tape Count: 179

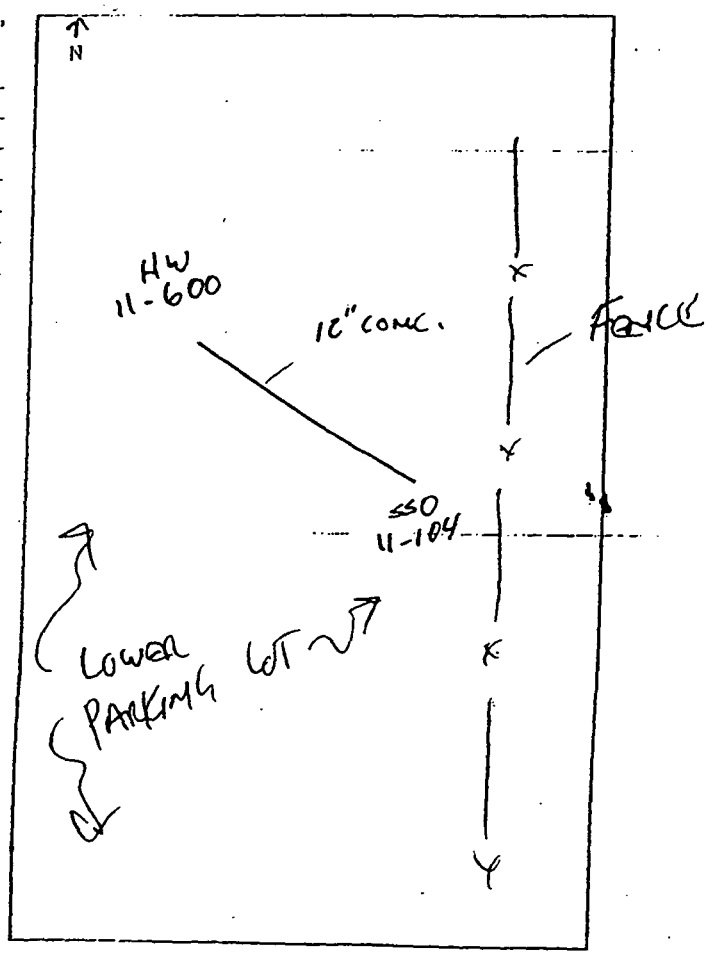
Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: SSO 11-104	NA	NA	NA	NA	–
MH #2: HW 11-600	61.0'				
MH #3:					
MH #4:					
MH #5:					
MH #6:					
MH #7:					

NOTES TOTAL 61.0'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

29.9' BAD OFFSET
36.7 " "
48.5 " "
55.2 " "

SKETCH



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ICF KAISER ENGINEERS
Sewer Video Inspection Form

Date: 9-29-94 Time: 845
Contractor: ADVANCED Operator: DUKE

Video Camera Manufacturer: ARIES
Video Camera Model #, Serial #: EE1000B SN 037 J. OLBERDING

Manufacture of VCR: PANASONIC
VCR Model #, Serial #: DV4924 SN A9510021

Tape #: 6
Begining Tape Count: 0
Ending Tape Count: 518

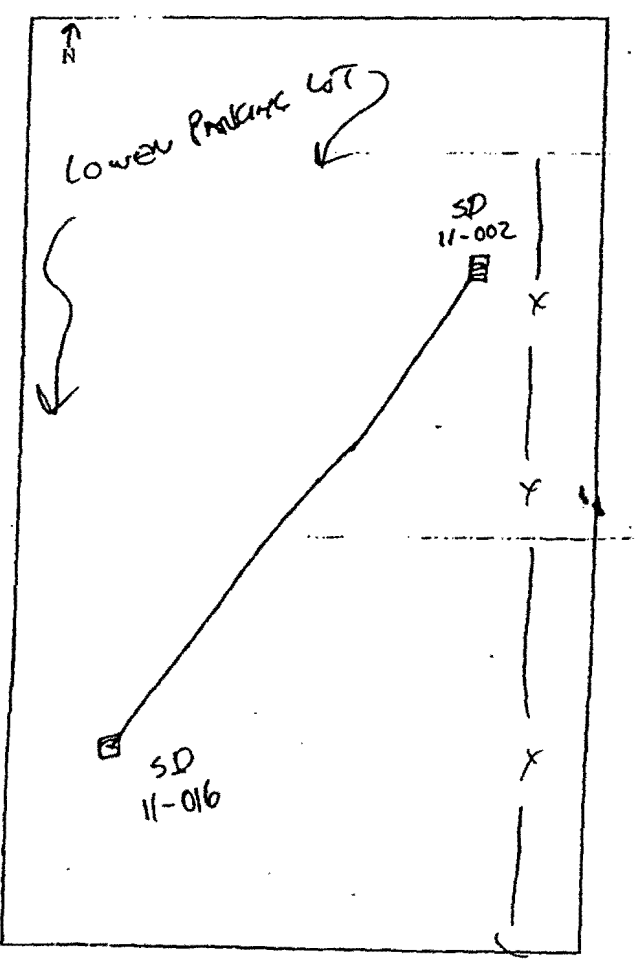
Line ID by Manhole:		FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1:	SD 11-002	NA	NA	NA	NA	—
MH #2:	SD 11-016	301.5				
MH #3:						
MH #4:						
MH #5:						
MH #6:						
MH #7:						

NOTES TOTAL 301.5'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

118.7 BAD OFFSET JOINT
163.8' " "
198.0' CRACK 5:00 BOTTOM OF PIPE
214.0 CRACK 4:00 TO 6:00
219.0 CRACK 4:00 TO 6:00
225.0 CRACK AT 5:00
245.0 CRACK 9:00 TO 7:00
262.8 CRACK 5:00
263.5 RADIAL CRACK 5:00-11:00
263.5 CRACK 6:00
266.5 OFFSET JOINT (BAD)
273.5 CRACK 6:00
284.4 OFFSET JOINT
290.8 OFFSET JOINT

SKETCH



ICF KAISER ENGINEERS
Sewer Video Inspection Form

Date: 8-29-94 Time: 930
Contractor: ADVANCED Operator: DUKE

Video Camera Manufacturer: ARIES
Video Camera Model #, Serial #: EE 1000B SN-037

S.T
J. OLBERDING.

Manufacture of VCR: PANASONIC
VCR Model #, Serial #: PV 4924 SN A9511021

Tape #: 6
Begining Tape Count:
Ending Tape Count:

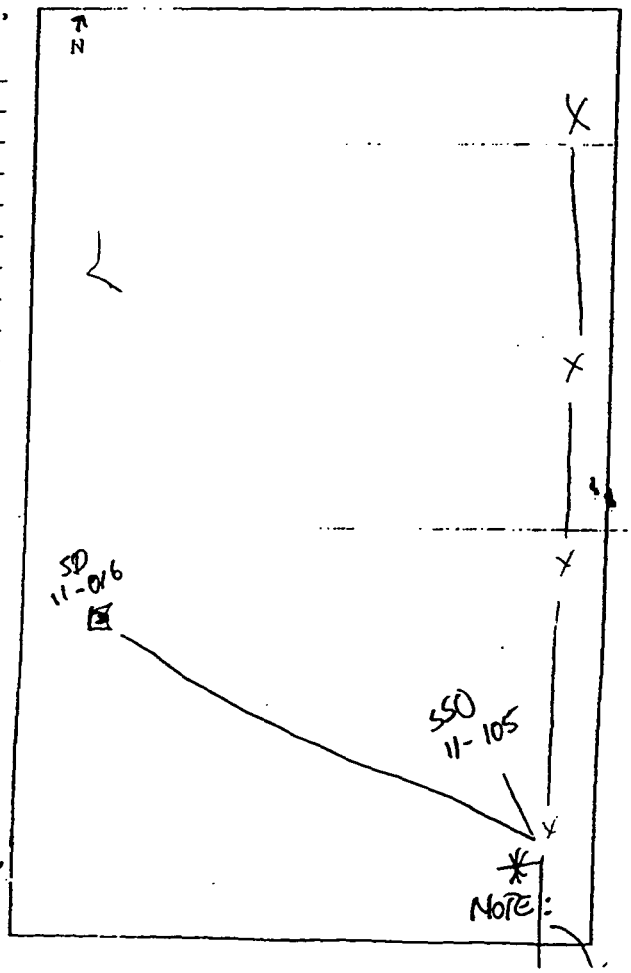
Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: SD 11-016	NA	NA	NA	NA	LINE IN BAD
MH #2: SSO 11-105	228.3				CONDITION
MH #3:					REPLACE
MH #4:					
MH #5:					
MH #6:					
MH #7:					

NOTES TOTAL 228.3'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

0.7' OFFSET JOINT
12.3 " "
14.3 RADIAL CRACK 11:00 - 6:00
16.0 GROUT JOINT - OFFSET JOINT
17.4 CRACK 11:00
17.4 CRACKS 3:00
18.5 GROUT JOINT
23.4 CRACK 3:00 - 5:00
25.2 CRACKS 12:00
28.2 OFFSET JOINT
31.3 OFFSET JOINT & CRACK AT 6:00
34.5 OFFSET " " " 12:00
37.4 " " " " "
38.0 CRACK @ 6:00
39.3 OFFSET JOINT
46.0 " "
49.3 " " CRACK @ 12:00
52.3 " " " "
55.3 CRACKED PIPE @ 12:00
58.3 SEPERATED JOINT
63.7 CRACKED 11:00
67.3 BAD OFFSET JOINT
74.5 CRACKS
77.1 BAD OFFSET JOINT
84.1 CRACKS
89.5 "
92.5 CRACKS WATER LEAKING IN FROM TOP
96.5 OFFSET JOINT CRACKS

SKETCH



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ICF KAISER ENGINEERS
Sewer Video Inspection Form

Date: 8-29-94 Time: 1045
Contractor: ADVANCED Operator: DUCE

Video Camera Manufacturer: ARIES
Video Camera Model #, Serial #: EE1000B SN 037 J. OLBERDING

Manufacture of VCR: PANASONIC
VCR Model #, Serial #: PU4924 SN A951102J

Tape #: 6
Begining Tape Count:
Ending Tape Count:

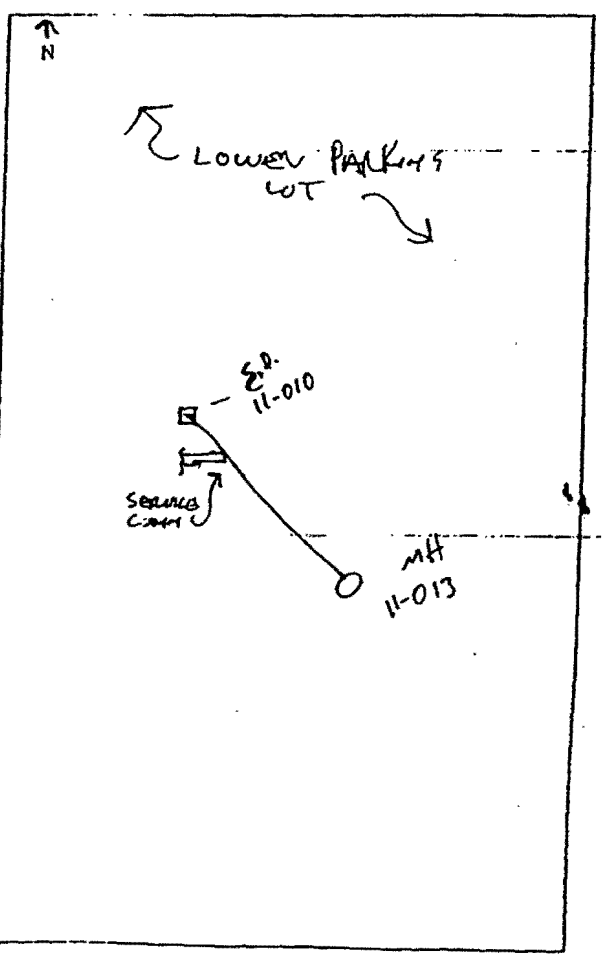
Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: MH 11-013	NA	NA	NA	NA	CMP
MH #2: ~~SD 11-010~~ JHO					
MH #3: END RUN AT	81.9'				
MH #4: SERVICE CONN					
MH #5:					
MH #6:					
MH #7:					

NOTES TOTAL 81.9'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

15.4' BAD JOINT LEAKAGE @ 2:00
30.0' " " " @ 11:00
33.4' " " " @ 10:00
~~36.1' RUST AT 9:00 JHO~~
49.8 BAD JOINT
56.5 CRACK @ 2:00
71.1 BAD JOINT
81.9' SERVICE CONN. @ 9:00

SKETCH



ICF KAISER ENGINEERS
Sewer Video Inspection Form

94

Date: 8-29-94 Time: 1115
Contractor: ADVANCED Operator: DUKES

Video Camera Manufacturer: ARIES
Video Camera Model #, Serial #: EE 1000B SN-037 J. OLBERDING

Manufacture of VCR: PANASONIC
VCR Model #, Serial #: PV4924 SN A9511021

Tape #: #6
Begining Tape Count:
Ending Tape Count:

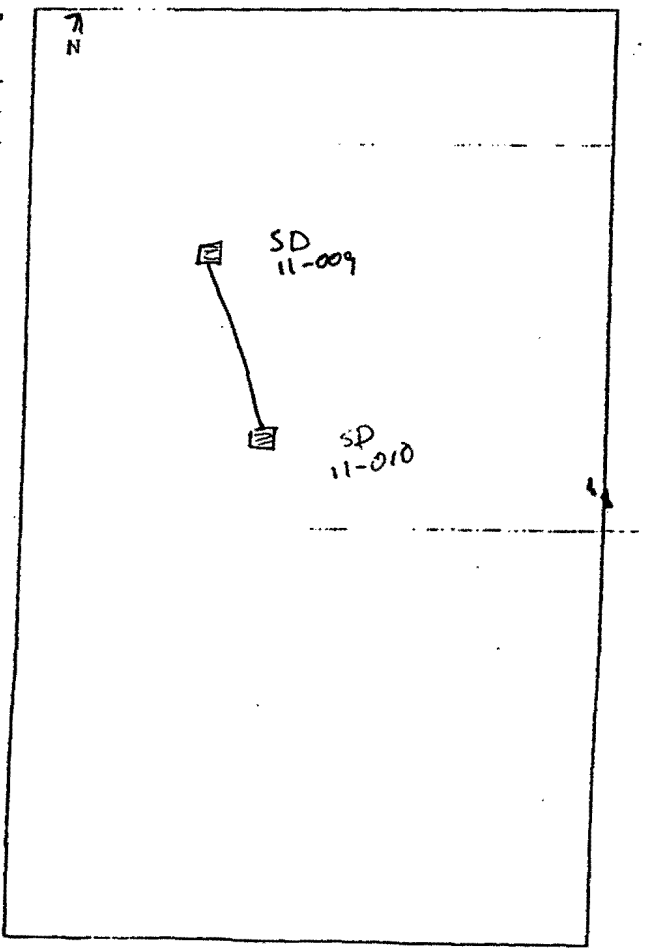
Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: SD-11-010	NA	NA	NA	NA	CMP
MH #2: SD-11-009	60.1'				
MH #3:					GOOD COND.
MH #4:					
MH #5:					
MH #6:					
MH #7:					

NOTES TOTAL 60.1'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

0.0 IN BELLY
20.0 END BELLY
SD 11-009 END BELL

SKETCH



ICF KAISER ENGINEERS
Sewer Video Inspection Form

95

Date: 8-29-94 Time: 1240
Contractor: ADVANCED Operator: DUKE

Video Camera Manufacturer: ARES
Video Camera Model #, Serial #: EE 1000B SN 037 J. OLBERDING

Manufacture of VCR: PANASONIC
VCR Model #, Serial #: PU4924 SN A95K021

Tape #: #6
Begining Tape Count:
Ending Tape Count:

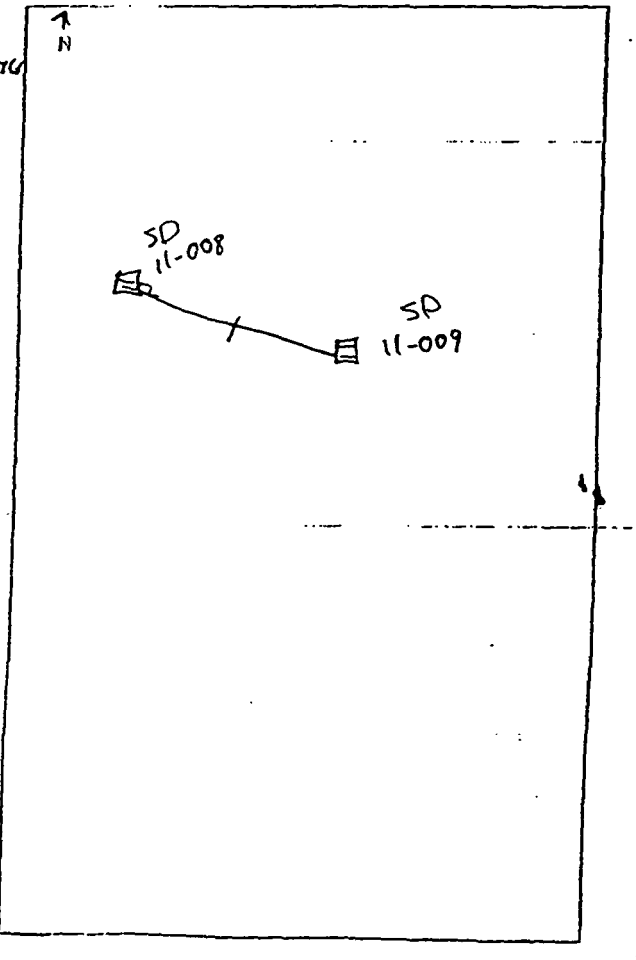
Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: SD 11-008	NA	NA	NA	NA	CMP
MH #2: ~~SD 11-009~~ JHO					
MH #3: Collapsed Conc Pipe. (100 FM)	18.7'				
MH #4:					
MH #5:					
MH #6:					
MH #7:					

NOTES TOTAL 18.7

(Identify AOC, problem, footage, tape count, additional lines, etc.)

50' METAL RUST PICKS STICKING IN LINE
15.9' CMP TO CONCRETE
18.7' COLLAPSED CONCRETE PIPE

SKETCH



ICF KAISER ENGINEERS
Sewer Video Inspection Form

9:6

Date: 8-29-94 Time: 1250
Contractor: ADVANCED Operator: DUKE

Video Camera Manufacturer: ARIES
Video Camera Model #, Serial #: EE 1000B SN 037

J. OLBERDING

Manufacture of VCR: PANASONIC
VCR Model #, Serial #: PV4924 SN A9511021

Tape #: #6
Begining Tape Count:
Ending Tape Count:

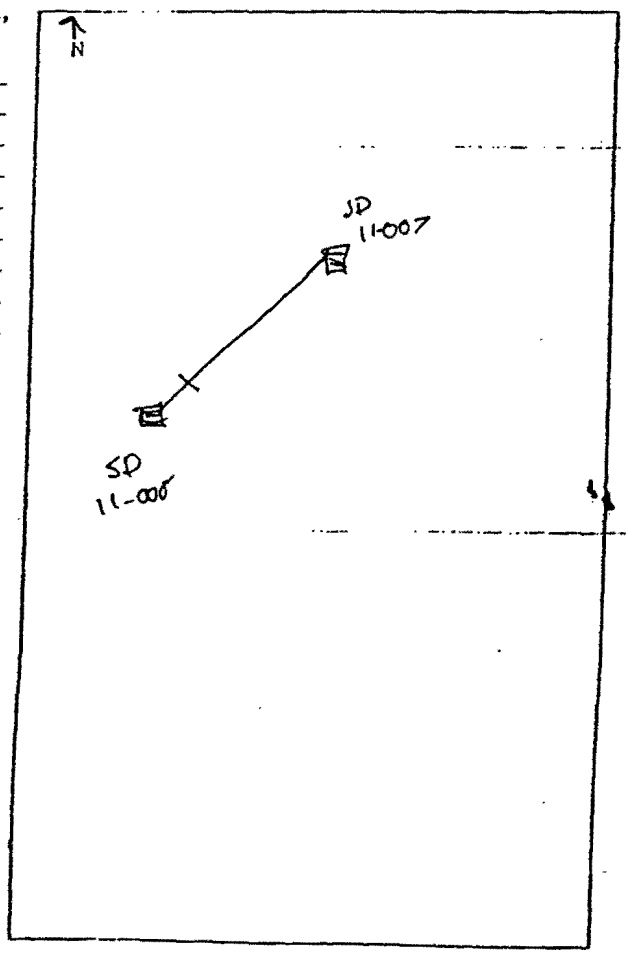
Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: SD 11-008	NA				CMP
MH #2: ~~SD 11-007~~ JHO		NA	NA	NA	
MH #3: DEBRIS (END RUN)	8.0'				Heavy DEBRIS (SILT, SAND, GRAVEL)
MH #4:					
MH #5:					PIPE RUSTY
MH #6:					
MH #7:					

NOTES TOTAL 8.0'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

8.0' Heavy DEBRIS (SAND, GRAVEL)

SKETCH



ICF KAISER ENGINEERS
Sewer Video Inspection Form

97

Date: 8-29-94 Time: 1300
Contractor: ADVANCED Operator: DUGG

Video Camera Manufacturer: ARIES
Video Camera Model #, Serial #: EE 1000 B SN-037 J. OLBBERding

Manufacture of VCR: PANASONIC
VCR Model #, Serial #: PV4924 SN A9511021

Tape #: #6
Begining Tape Count:
Ending Tape Count:

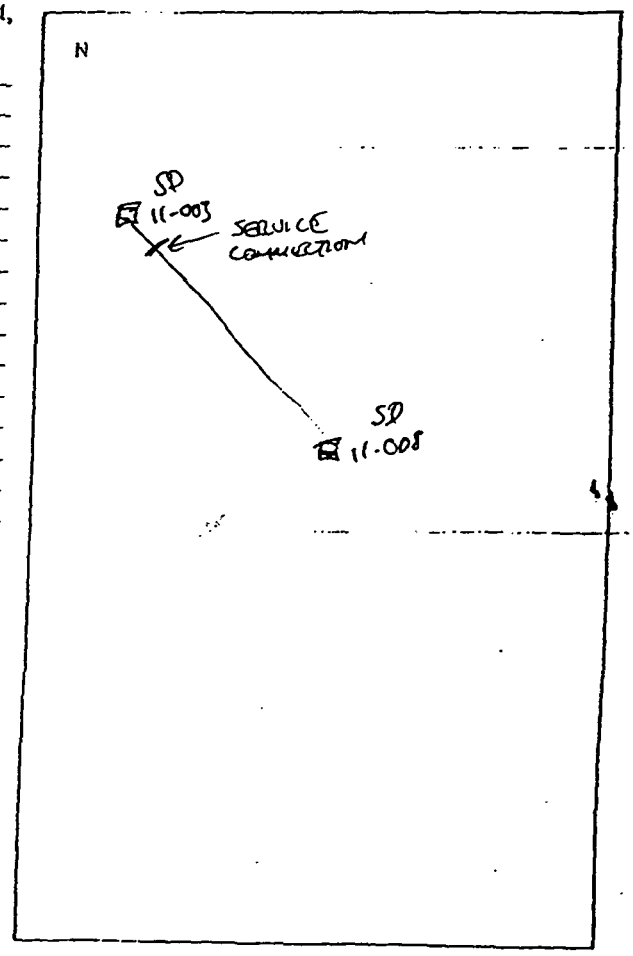
Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: SD 11-008	NA	NA	NA	NA	CMP
MH #2: ~~SD 11-003~~ JHO					RUSTY POOR COND.
MH #3: SERVICE CONN.	91.7'				
MH #4:					
MH #5:					
MH #6:					
MH #7:					

NOTES TOTAL 91.7'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

9.0' CRACK @ 12:00
12.7' HEAVY RUST/LEAKS
16.4 CRACK @ 11:00
19.4 " @ 12:00
32.7 BAD RUSTY JOINT LEAKING
53.0 BAD " " "
73.2 " " " "
75.7 " " "
91.7' SERVICE CONNECTION

SKETCH



ICF KAISER ENGINEERS

Sewer Video Inspection Form

98

Date: 8-29-94 Time: 1320

Contractor: ADVANCED Operator: DUKE

Video Camera Manufacturer: ARIES

Video Camera Model #, Serial #: CC 1000B SN 037 J. OLBERDING

Manufacture of VCR: PANASONIC

VCR Model #, Serial #: PV 4929 SN A9511021

Tape #: #6

Begining Tape Count:

Ending Tape Count:

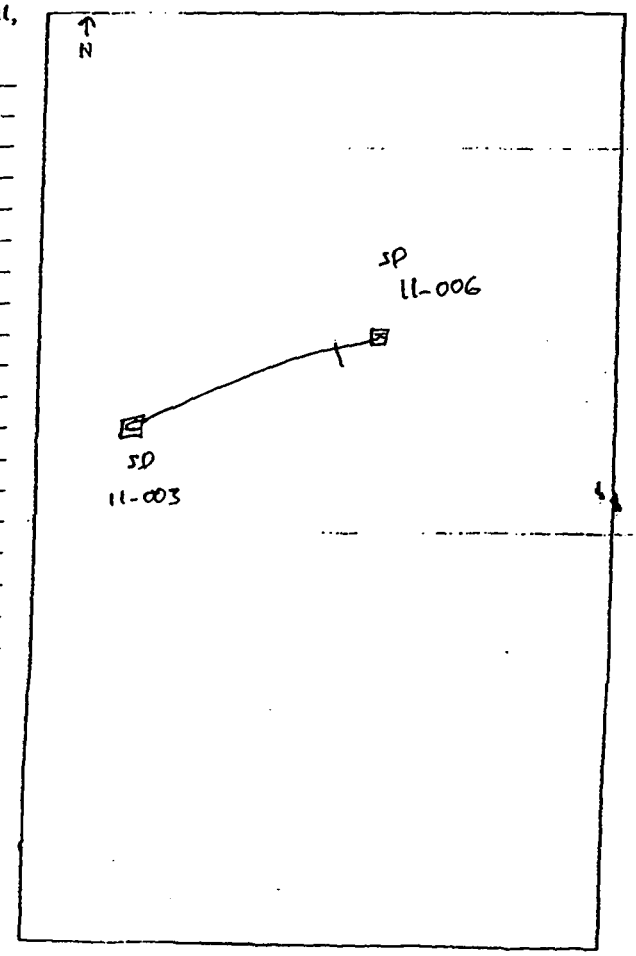
Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: SD 11-006	NA	NA	NA	NA	12" CMP
MH #2: ~~SD 11-003~~ JHO					
MH #3: DEBRIS	7.4'				
MH #4:					
MH #5:					
MH #6:					
MH #7:					

NOTES TOTAL 7.4'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

7.4' Heavy DEBRIS (END Run)

SKETCH



ICF KAISER ENGINEERS
Sewer Video Inspection Form

99

Date: 8-29-94 Time: 1345
Contractor: ADVANCED Operator: DUKE

Video Camera Manufacturer: ARIES
Video Camera Model #, Serial #: EE 1000B SN-037 J. OLBERDING

Manufacture of VCR: PANASONIC
VCR Model #, Serial #: PV 4924 SN A9511021

Tape #: #6
Begining Tape Count:
Ending Tape Count:

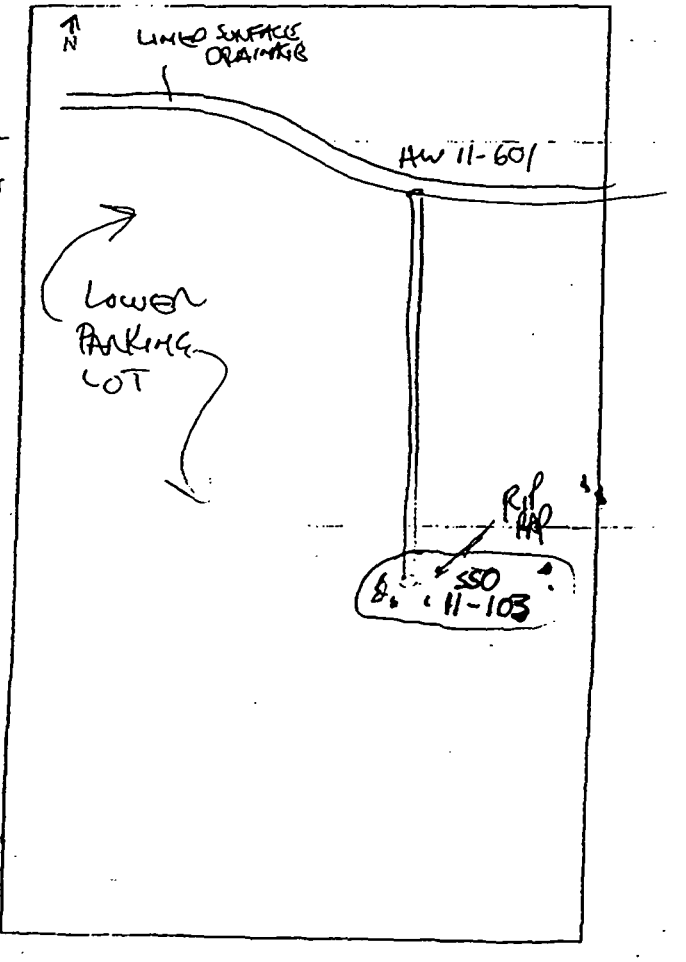
Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: HW 11-601	NA	NA	NA	NA	CONCRETE PIPE
MH #2: SO 11-103	193.0'				
MH #3:					PIPE IN POOR CONDITION
MH #4:					
MH #5:					
MH #6:					
MH #7:					

NOTES TOTAL 193.0'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

4.0' SEPERATED JOINT
11.2' " "
16.2' BADLY SEPERATED JOINT & CRACK
23.1 SEPERATED JOINT
28.6 " " W/ROOT & CRACKS
54.1 SEPERATED JOINT
57.2 " " W/ROOT
78.5 " " "
84.6 " "
108.3 OFFSET "
117.9 CRACK @ 3:00
124.0 CRACK @ 3:00
126.3 BAD SEPERATED JOINT W/ ROCKS COLLASPED
129.0 CRACKS @ 3:00/8:00
138.8 OFFSET JOINT
144.7 " "
147.0 CRACK 3:00 - 9:00
157.3 OFFSET JOINT
163.1 " "
169.5 OFFSET & CRACKED JOINT
175.3 COLLASPING JOINT
180.0 CRACKED & COLLASPING JOINT
187.5 OFFSET JOINT
193.0' END RUN

SKETCH



ICF KAISER ENGINEERS
Sewer Video Inspection Form

100

Date: 8-29-94 Time: 1455
Contractor: ADVANCED Operator: DUKE

Video Camera Manufacturer: ARIES
Video Camera Model #, Serial #: EE1000B SN-037

J. OLBERDING

Manufacture of VCR: PANASONIC
VCR Model #, Serial #: PV 4924 SN A9511021

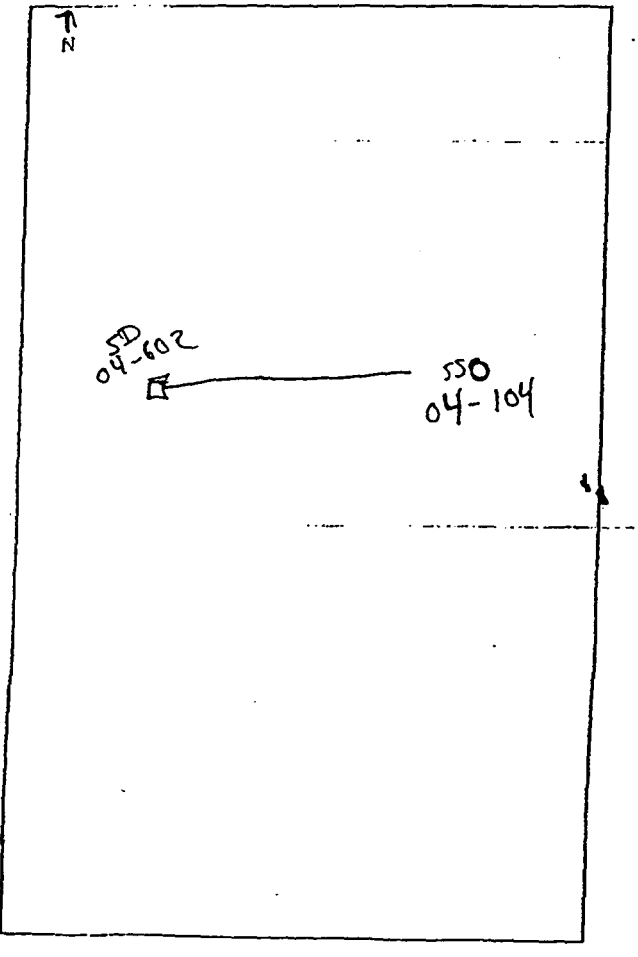
Tape #: #6
Begining Tape Count:
Ending Tape Count:

Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: SD-04-602	NA	NA	NA	NA	CMP
MH #2: SSO 04-104	76.9'				
MH #3:					Sem Fen Pile on Bottom
MH #4:					
MH #5:					
MH #6:					
MH #7:					

NOTES TOTAL 76.9'

(Identify AOC, problem, footage, tape count, additional lines, etc.)
PIPE IN GOOD CONDITION

SKETCH



ICF KAISER ENGINEERS
Sewer Video Inspection Form

101

Date: 8-29-94 Time: 1510
Contractor: ADVANCED Operator: DUKE

Video Camera Manufacturer: ARIES
Video Camera Model #, Serial #: EE 1000B SN 037 J. ALBERTING

Manufacture of VCR: PANASONIC
VCR Model #, Serial #: PV 4924 SN A9S1102

Tape #: #6
Begining Tape Count:
Ending Tape Count:

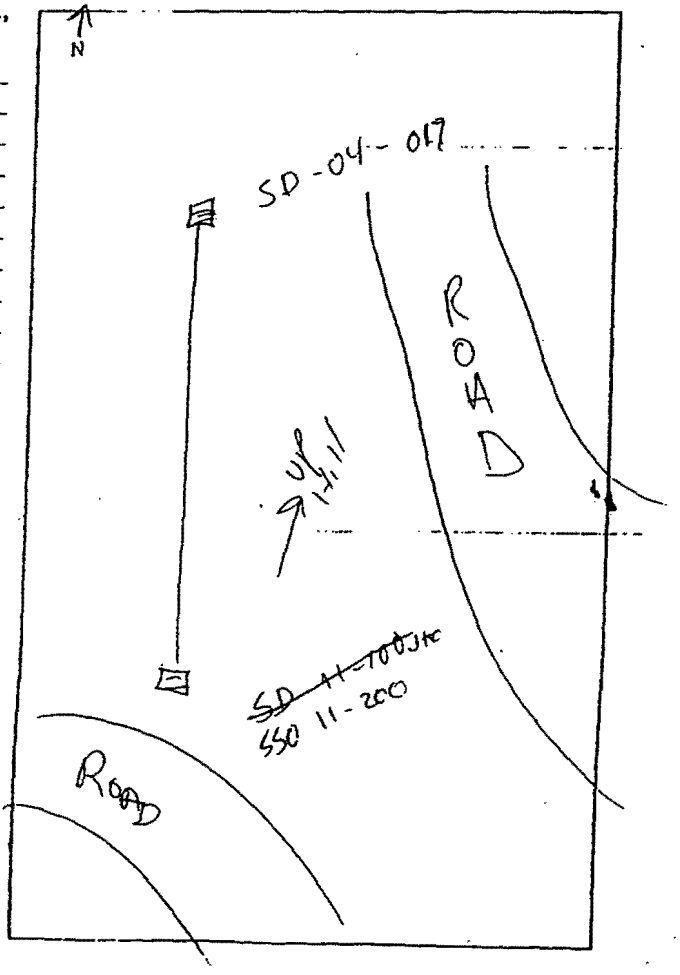
Line ID by Manhole:	FOOTAGE	HnU	CGI	Other	COMMENTS
MH #1: ~~SD-11-100JK~~ SSO 11-200	NA	NA	NA	NA	24" CMP
MH #2: SD-04-017	172.7				
MH #3:					
MH #4:					
MH #5:					
MH #6:					
MH #7:					

NOTES TOTAL 172.7'

(Identify AOC, problem, footage, tape count, additional lines, etc.)

125.7 OFFSET JOINT
148.2 " "
168.7 " "

SKETCH



APPENDIX B

VIDEO SURVEY RESULTS

Plate B.1. Storm Sewers (Sheet 1 of 2)

Plate B.2. Storm Sewers (Sheet 2 of 2)

Plate B.3. Sanitary Sewers

APPENDIX C

APPENDIX C

HORIZONTAL AND VERTICAL LOCATION SURVEYING DATA

Storm Sewers	Pages C-2 through C-8
Sanitary Sewers	Pages C-9 through C-10

HORIZONTAL AND VERTICAL LOCATION SURVEYING DATA STORM SEWERS

POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION	SOUTH	WEST
1000	597733.6270	1495419.6500	745.23	T/STEEL/PIPE	2121.3094	3980.3464
1006	597750.3760	1495427.7700	745.97	INV/STEEL/PIPE	2109.4107	3966.0326
1098	598070.3680	1495838.9000	825.59	MH 05 A	1987.8380	3459.4333
1099	598064.1750	1495871.7700	823.70	MH 05 B	2007.0565	3432.0575
1102	599089.3388	1496491.8202	874.44	MH 04 001	1329.6004	2443.8894
1103	599104.4818	1496516.0002	871.72	SD 04 007	1325.7987	2415.6134
	NOTE: 4" VCP E, D = 2.63', INV = 869.09'; 4" PVC E, D = 1.85', INV = 869.87'					
1104	599138.3820	1496631.0501	867.50	SD 04 006	1342.4537	2296.8350
1105	599146.0521	1496648.2701	867.44	SD 04 005	1342.5824	2277.9845
1106	599259.9590	1496596.6499	867.35	SD 04 008	1217.5247	2277.9389
1107	599250.7409	1496575.8099	867.32	SD 04 009	1217.3103	2300.7256
1108	598989.0516	1496844.1798	860.29	SD 04 102	1566.4911	2164.4299
1109	599161.4954	1496765.0771	864.29	SD 04 018	1376.7717	2165.2304
1110	599197.7612	1496748.6066	864.32	SD C	1336.9410	2165.2484
1111	599001.3828	1496726.1396	865.45	MH 04 004	1506.4985	2266.8332
	NOTE: 24" RCP W, D = 5.60', INV = 859.85'; 24" RCP N, D = 10.37', INV = 855.08'; 24" RCP SE, D = 10.40', INV = 855.05'					
1112	598990.4989	1496670.1598	866.35	SD 04 003	1493.2849	2322.3093
1113	598969.2080	1496546.1501	874.35	MH 04 002	1461.4454	2444.0383
	NOTE: 24" RCP E, D = 5.18', INV = 869.17'; 18" RCP N, D = 4.92', INV = 869.43'; 12" RCP N, D = 4.42', INV = 869.93'; 6" VCP NE, D = 4.48', INV = 869.87'					
1114	598728.7989	1496606.4839	868.63	MH 09 003	1705.3063	2488.4070
	NOTE: 10" PVC NW, D = 6.45', INV = 862.18'; 10" PVC N, D = 7.27', INV = 861.36'; 8" VCP S, D = 7.22', INV = 861.41'					
1115	598782.6699	1496665.0030	851.61	SD 09 005	1680.4213	2412.8603
	NOTE: 12" CMP N, D = 5.42', INV = 846.19'; 12" CMP E, D = 5.61', INV = 846.00'; 12" CI S, D = 5.75', INV = 845.86'					
1116	598727.8216	1496649.4939	845.15	SD 09 004	1723.9639	2449.6422
	NOTE: 12" CI N, D = 3.15', INV = 842.00'; 12" CI S, D = 3.25', INV = 841.90'; 8" PVC W, D = 3.10', INV = 842.05'					
1117	598638.3802	1496623.4753	839.17	SD 08 007	1794.6684	2510.2854
	NOTE: 12" CI N, D = 3.36', INV = 835.81'; 12" CI S, D = 3.40', INV = 835.77'; 12" CI E, D = 3.38', INV = 835.79'					
1120	597988.2039	1496086.2403	805.08	194 T BLD	2164.8405	3268.1266
1122	599150.1615	1497167.3588	812.34	SD 11 006	1553.2770	1803.5609
1123	599110.7044	1497224.6801	809.40	SD 11 003	1612.8895	1767.6591
1124	599196.1194	1497254.6072	804.74	SD 11 007	1547.4664	1705.1197
1125	599221.4549	1497299.3464	801.72	SD 11 009	1542.8756	1653.9103
1126	599171.0199	1497298.8481	803.18	SD 11 008	1588.6001	1675.1990
1127	599463.1097	1497084.5683	810.11	T/CONC PIPE	1234.0789	1749.6771
1128	599565.1892	1497098.6049	806.06	T/CONC PIPE	1146.9153	1694.7249
1129	599423.7623	1496741.6996	862.14	SSO 04 107	1128.2720	2078.1768
	NOTE: 8" CMP, T/CMP					
1130	599396.3367	1496755.0405	859.58	SSO 04 106	1158.7592	2077.3570
	NOTE: 12" CMP, T/CMP					
1131	599394.8877	1496754.0306	859.44	HW 04 108	1159.6616	2078.8754
	NOTE: 12" CMP, T/CMP					
1132	599376.8879	1496761.4312	858.58	T/CMP	1179.1109	2079.5715
1133	599226.7360	1496823.9962	850.97	SSO 04 103	1341.6977	2084.6227
	NOTE: 15" CMP, T/CMP					
1134	599169.5364	1496866.2681	846.10	SSO 04 109	1411.2511	2069.7556
	NOTE: 12" CMP, T/CMP					
1135	599080.3736	1496932.3911	837.31	SD 04 017	1519.7659	2046.3718
1136	599112.0238	1496967.6516	839.48	SD 11 001	1505.5088	2001.1859
	NOTE: 12" CMP E, D = 2.75', INV = 836.73'					

HORIZONTAL AND VERTICAL LOCATION SURVEYING DATA STORM SEWERS

POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION	SOUTH	WEST
1137	599146.7272	1496996.8912	826.26	SSO 11 100	1485.9839	1960.2218
	NOTE: 12" CMP, T/CMP					
1138	599257.7305	1497349.5797	800.22	SD 11 010	1530.5916	1593.1781
1139	599184.8761	1497408.7505	800.55	SD 11 011	1621.3825	1569.3885
1140	599198.1830	1497401.0404	801.26	SD 11 012	1606.0790	1570.9129
	NOTE: 12" RCP E, D = 6.95', INV = 794.31'; 18" RCP SW, D = 6.82, INV = 794.44'; 15" CMP W, D = 3.27', INV = 797.99'					
1141	599324.0764	1497429.1590	796.32	MH 11 013	1503.0458	1493.2988
1142	599333.3565	1497441.9189	795.41	SD 11 014	1499.8657	1477.8449
	NOTE: 12" CMP W, D = 5.30', INV = 790.11'					
1143	599420.6506	1497452.0879	793.53	MH 11 015	1424.5691	1432.5227
1144	599427.6537	1497462.6678	792.60	SD 11 016	1422.5621	1419.9948
1145	599028.7514	1497252.4023	821.06	SD 11 004	1698.9750	1776.2680
1146	598997.2536	1497268.9927	820.01	SD 11 005	1734.5131	1774.1712
1147	599563.4807	1497191.9263	798.66	SD 11 002	1187.0225	1610.4444
1148	599130.9723	1497737.3321	795.87	SD 11 017	1806.2099	1292.4222
1149	599168.8653	1497737.6115	797.70	MH 11 018	1771.8167	1276.5141
1150	599217.3416	1497821.5507	795.43	MH 11 020	1762.3456	1180.0462
1151	599219.4194	1497747.8307	789.82	MH 11 019	1729.9994	1246.3235
1152	599260.2726	1497757.2700	786.47	SD 11 021	1696.6945	1220.8507
1153	599266.7997	1497704.8299	785.53	SD 11 022	1669.0872	1265.9107
1154	599329.2168	1497707.1989	782.43	T/CMP	1613.2236	1237.9686
1155	599335.0098	1497707.2589	782.11	T/CMP	1607.9728	1235.5210
1156	599374.1366	1497761.8482	779.67	SD 11 023	1594.8916	1169.6439
1157	599516.1116	1497759.1160	771.88	SD 11 024	1464.4685	1113.4818
1158	599571.9068	1497773.5751	769.19	MH 11 026	1419.6297	1077.2650
1159	599516.4058	1497707.2260	771.45	SD 11 025	1442.7647	1160.6157
1160	598850.9343	1495762.5804	876.91	SD 02 100	1245.4606	3206.4822
1161	598888.3125	1495912.0706	877.91	MH 02 002	1273.1757	3054.9028
	NOTE: 15" W, D = 5.00', INV = 872.91'; 12" SE, D = 4.70', INV = 873.21'; 12" N, D = 4.94', INV = 872.97'; 6" PVC NW, D = 1.31', INV = 876.60'					
1162	598892.3064	1495939.5906	878.06	SD 02 103	1280.9071	3028.1908
1163	598927.5561	1495996.6808	877.89	SD 02 006	1272.3899	2961.6380
1164	598962.0433	1496051.1198	877.44	MH 02 005	1263.4718	2897.8145
	NOTE: 12" RCP NW, D = 4.95', INV = 872.49'; 12" RCP E, D = 5.06', INV = 872.38'					
1165	598976.9486	1496129.7597	877.20	SD 03 002	1282.3841	2820.0409
1166	598991.6156	1496123.3497	876.97	SD 03 003	1266.3791	2819.8194
1167	598995.6666	1496121.3097	877.54	MH 03 005	1261.8472	2820.0038
1168	598988.8305	1496108.2197	877.61	MH 03 007	1262.6652	2834.7486
1169	598959.3831	1495993.6098	877.48	MH 02 004	1242.1369	2951.2869
1170	598943.9415	1495887.0008	877.80	MH 02 001	1212.1588	3054.7530
1171	599013.6148	1496113.0400	877.96	SD 03 006	1242.0858	2820.1204
	NOTE: 10" RCP W, D = 3.60', INV = 874.36'; 12" RCP S, D = 6.65', INV = 871.31'; 12" RCP E, D = 6.75', INV = 871.21'; 12" RCP SW, D = 6.76', INV = 871.20'; 12" RCP W, D = 7.70', INV = 870.26'; 6" VCP NW, D = 4.70', INV = 873.26'					
1172	599032.3060	1496152.5399	875.32	SD 03 021	1241.3816	2776.4271
1173	599064.4842	1496226.3398	874.32	SD 03 020	1242.5643	2695.9257
	NOTE: 12" RCP W, D = 3.90', INV = 870.42'; 12" RCP N, D = 4.80', INV = 869.52'					
1174	599084.8691	1496204.1597	875.74	SD 03 109	1214.8374	2707.7037
	NOTE: 4" CI N, D = 2.15', INV = 873.59'; 1.00' SQ. GRATE					
1175	598881.5502	1496220.5305	878.02	SD 03 012	1406.7596	2776.7867
	NOTE: 4" CI SW, D = 0.95', INV = 877.07'; 4" CI N, D = 1.05', INV = 876.97'; 10" CI W, D = 2.05', INV = 875.97'					
1176	598978.9894	1496276.8901	878.33	MH 03 102	1341.3056	2685.2085
	NOTE: 12" RCP S, D = 4.50', INV = 873.83'					
1177	599084.5636	1496327.8197	874.66	SD 03 010	1266.2000	2595.2147

HORIZONTAL AND VERTICAL LOCATION SURVEYING DATA STORM SEWERS

POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION	SOUTH	WEST
1178	599026.7627	1496353.7599	874.43	SD 03 011	1329.5543	2595.4691
	NOTE: 12" RCP N, D = 2.91', INV = 871.42'; 12" RCP E, D = 3.00', INV = 871.33'					
1179	598856.6686	1496441.5102	874.99	SD 03 015	1520.7063	2585.8226
1180	598918.5185	1496434.0496	874.30	SD 03 014	1461.2985	2567.0665
	NOTE: 12" RCP E, D = 3.08', INV = 871.22'; 12" RCP SW, D = 2.60', INV = 871.70'; 12" RCP W, D = 3.04', INV = 871.26'					
1181	598869.5424	1496326.8301	877.49	SD 03 013	1461.6076	2684.9418
1182	598861.8793	1496506.2001	874.38	SD 03 115	1542.6846	2524.7580
1183	598760.3777	1496550.3212	874.91	SD 08 101	1653.3470	2526.5082
1184	598741.8609	1496570.5514	875.22	MH 08 006	1678.5671	2515.7342
	NOTE: 10" PVC SE, D = 4.87', INV = 834.30'; 10" VCP NW, D = 4.84', INV = 834.33'; 6" VCP N, D = 4.75', INV = 834.42'					
1185	598834.4370	1496173.2000	876.61	SD 03 029	1430.1125	2839.3525
1186	598824.2460	1496139.1700	876.59	SD 03 016	1425.3354	2874.5530
1187	598813.2290	1496144.3900	876.77	SD 03 017	1437.5248	2874.3504
1188	598830.7780	1496136.4600	877.28	MH 03 008	1418.2673	2874.3225
1189	598849.0410	1496108.1700	877.48	SD 02 105	1389.9488	2892.5413
1190	598786.8630	1496039.3400	877.71	MH 02 010	1418.1395	2980.9096
1191	598736.6340	1495945.4700	876.80	SD 02 009	1425.1043	3087.1453
1192	598724.1660	1495951.0400	876.78	SD 02 008	1438.7597	3087.2234
1193	598713.0320	1495843.2800	878.19	MH 02 007	1404.3833	3189.9582
1194	598722.4289	1496257.0201	876.83	SD 03 101	1566.7429	2809.2896
1195	598717.4539	1496253.9301	877.67	MH 03 009	1569.9971	2814.1588
1196	598689.2390	1496265.4402	877.56	MH 08 001	1600.4468	2815.3324
	NOTE: 15" RCP N&S, D = 4.73', INV = 872.83'; 6" CI NE, D = 4.29', INV = 873.27'					
1197	598372.5249	1496002.1101	876.32	SD 07 009	1780.0909	3185.9786
1198	598389.4569	1495999.1800	876.63	MH 07 007	1763.4608	3181.6522
	NOTE: 30" RCP N&E, D = 5.94', INV = 870.69'					
1199	598425.2569	1496075.3700	877.01	SD 07 004	1762.3326	3097.4781
	NOTE: 10" VCP N&E, D = 2.69', INV = 874.32'					
1200	598452.1439	1496134.1900	877.24	SD 07 003	1762.1457	3032.8046
	NOTE: 8" VCP W, D = 2.68', INV = 874.56'					
1201	598454.4580	1496150.7700	877.34	MH 07 002	1766.8876	3016.7495
	NOTE: 20" NE, D = 6.14', INV = 871.20'; 20" N, D = 6.18', INV = 871.16'; 24" W, D = 6.40', INV = 870.94'					
1202	598452.7960	1496179.3000	876.71	SD 07 100	1780.1870	2991.4542
	NOTE: 8" CMP NW, D = 2.51', INV = 874.20'					
1203	598514.1900	1496268.5900	876.93	SD 08 003	1761.1624	2884.7772
1204	598497.1730	1496276.1800	876.55	SD 08 004	1779.7949	2884.8949
	NOTE: 10" RCP N, D = 2.97', INV = 873.58'					
1205	598575.9360	1496309.3000	877.22	MH 08 002	1721.7487	2822.1958
	NOTE: 15" RCP N, D = 5.02', INV = 872.20'; 15" RCP W, D = 5.20', INV = 872.02'					
1206	598475.5570	1496156.9600	877.79	MH 07 001	1750.2302	3002.3963
	NOTE: 20" RCP E, D = 5.92', INV = 871.87'; 20" RCP SW, D = 6.10', INV = 871.69'					
1207	598389.7940	'1495994.4900	876.51	SD 07 010	1761.2163	3185.7841
	NOTE: 12" N&S, D = 3.02', INV = 873.49'					
1208	598395.9330	1495991.2300	877.41	MH 07 008	1754.2789	3186.2169
	NOTE: 30" RCP W, D = 6.94', INV = 870.47'; 30" RCP E, D = 6.90', INV = 870.51'; 30" RCP S, D = 6.83', INV = 870.58'; 12" RCP N, D = 4.20, INV = 873.12'; 12" RCP S, D = 6.10', INV = 871.31'					
1209	598316.6880	1495819.6300	876.63	MH 06 001	1755.5577	3375.2267
	NOTE: 33" RCP E, D = 7.19', INV = 869.44'; 24" RCP NW, D = 6.93', INV = 869.70'; 33" RCP SW, D = 12.02', INV = 864.61'					
1210	598420.9980	1495718.0200	875.19	SD 06 004	1618.5889	3424.6706
	NOTE: 6" VCP NE&SW, D = 1.96', INV = 873.23'					
1211	598428.5800	1495735.0200	875.17	SD 06 005	1618.7068	3406.0568
	NOTE: 10" RCP W, D = 3.00', INV = 872.17'; 10" RCP E, D = 3.10', INV = 872.07'					

HORIZONTAL AND VERTICAL LOCATION SURVEYING DATA STORM SEWERS

POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION	SOUTH	WEST
1212	598409.2470	1495738.6400	875.59	MH 06 105	1637.8085	3410.7467
1213	598567.2270	1495651.6500	874.44	SD 01 019	1458.0027	3424.7051
1214	598573.1590	1495669.3000	874.41	SD 01 018	1459.8918	3406.1810
1215	598663.0960	1495767.1099	877.27	MH 01 015	1418.3931	3279.9539
	NOTE: 24" E&W, D = 6.03', INV = 871.24'					
1216	598674.1148	1495788.7700	877.59	MH 01 014	1417.3063	3255.6764
	NOTE: 24" RCP E&W, D = 6.19', INV = 871.40'; 24" RCP S, D = 6.05', INV = 871.54'					
1217	598512.6349	1495600.9293	871.76	SD 01 022	1486.7660	3493.4478
	NOTE: 6" CI W, D = 2.12', INV = 869.64'					
1218	598470.7102	1495625.9608	871.82	SD 01 020	1535.2868	3487.9712
	NOTE: 10" RCP S, D = 3.20', INV = 868.62'; 6" CI NW, D = 3.05', INV = 868.77'					
1219	598462.2793	1495629.7811	871.78	SD 01 021	1544.5428	3487.9750
	NOTE: 10" RCP N&S, D = 3.38', INV = 868.40'					
1220	598390.1377	1495671.2805	869.95	SD 06 100	1627.3846	3479.9840
	NOTE: 6" CI SW, D = 1.20', INV = 868.75'; 6" CMP S, D = 0.00', INV = 869.95'					
1221	598407.3204	1495659.6201	871.48	SD 06 004	1606.9196	3483.5047
1222	598774.7300	1495567.2300	873.42	SD 01 010	1234.1589	3415.8650
	NOTE: 10" RCP S, D = 3.10', INV = 870.30'					
1223	598763.7660	1495590.1400	873.15	SD 01 009	1253.6078	3399.5305
	NOTE: 15" RCP NE, D = 3.33', INV = 869.82'; 10" RCP NW, D = 2.83', INV = 870.32'; 18" RCP W, D = 3.33', INV = 869.82'					
1224	598621.9810	1495532.6700	869.29	SD 01 008	1358.9882	3510.4393
	NOTE: 15" CMP E, D = 1.96', INV = 867.33'; 6" CMP S, D = 1.86', INV = 867.43'; 18" RCP W, D = 2.82', INV = 866.47'					
1225	598535.8970	1495493.8700	863.09	SD 01 007	1421.3551	3581.3354
	NOTE: 18" RCPG E, D = 2.79', INV = 860.30'; 18" RCP W, D = 3.02', INV = 860.07'; 8" CMP S, D = 1.64', INV = 861.45'					
1226	598484.7780	1495470.9900	859.76	SD 01 006	1458.4566	3623.2893
	NOTE: 18" RCP E, D = 3.13', INV = 856.63'; 18" RCP W, D = 3.32', INV = 856.44'; 8" CI S, D = 2.88', INV = 856.88'					
1227	598467.3750	1495466.6400	859.28	SD 01 005	1472.5083	3634.4400
	NOTE: 18" RCP E&W, D = 3.15', INV = 856.13'					
1228	598420.1050	1495478.8000	858.19	SD 01 003	1520.5796	3642.8934
	NOTE: 18" RCP NE, D = 3.12', INV = 855.07'; 18" RCP W, D = 3.23', INV = 854.94'; 4" PVC S, D = 1.87', INV = 856.32'; 4" CI S, D = 2.44', INV = 855.75'					
1229	598418.6386	1495500.4767	859.01	SD 01 002	1530.8698	3623.7586
1230	598386.7704	1495446.0580	853.89	SSO 01 001	1537.4112	3686.4817
	NOTE: 24" RCP, INV CONC PIPE					
1231	598335.5044	1495520.3600	856.51	SD 06 008	1614.7927	3639.9941
1232	598290.7984	1495594.8319	848.94	SD 06 007	1686.2702	3590.6419
	NOTE: 18" RCP N, D = 3.45', INV = 845.49'; 33" RCP SE&NW, D = 3.97', INV = 844.97'					
1233	598246.6046	1495624.3737	846.17	SD 06 101	1738.7206	3581.9953
1234	598256.7765	1495647.4332	844.98	SD 06 102	1738.9832	3556.7932
1235	598261.5971	1495661.1930	841.57	INV CONC PIPE	1740.2774	3542.2710
1236	598213.2312	1495738.4850	837.14	SD 06 010	1816.2530	3491.8625
1237	598203.5892	1495714.2854	838.58	SD 06 009	1815.0368	3517.8838
1238	598197.8788	1495776.9556	834.70	SD 06 011	1846.1265	3463.1700
	NOTE: 4" VCP, D = 4.88', INV = 829.82'; BLDG. 48 FOUNDATION DRAIN					
1239	598233.0605	1495720.9242	838.17	T/CONC PIPE	1790.9403	3499.6633
1240	598271.0949	1495484.2427	836.58	SD 05 004	1658.5292	3699.4934
1241	598208.2518	1495480.8352	829.30	SSO 05 003	1714.3518	3728.5572
	NOTE: 33" RCP, T/CONC PIPE					
1242	598290.2566	1495628.6806	850.61	INV CLAY PIPE	1700.7467	3560.0403
1243	598083.8363	1495650.7686	810.28	SD 05 101	1897.8550	3625.1978
1244	598103.8169	1495484.2988	800.57	SD 05 002	1810.8898	3768.5452
	NOTE: 6" CMP NW, D = 2.48', INV = 789.09'; 15" CMP SW, D = 3.72', INV = 796.85'					

HORIZONTAL AND VERTICAL LOCATION SURVEYING DATA STORM SEWERS

POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION	SOUTH	WEST
1245	598037.7825	1495424.5482	797.71	SD 05 001	1846.3432	3850.2382
	NOTE: 15" CMP NE, D = 2.35', INV = 795.36'; 10" VCP N, D = 2.46', INV = 795.25'; 15" CMP SW, D = 4.78', INV = 792.93'					
1246	598322.7431	1495671.6709	862.01	INV CONC PIPE	1688.9211	3507.4694
1247	598163.3163	1495798.6700	831.53	SD 06 012	1886.5723	3457.6729
1248	598170.1708	1495828.6801	829.68	SD 06 013	1892.7272	3427.5116
1249	598162.1135	1495852.4700	827.54	SD 06 014	1909.8926	3409.1750
1250	598150.1918	1495894.4998	825.00	SD 06 015	1938.1121	3375.8240
1251	598128.9015	1495914.8395	826.13	SD 06 016	1965.9032	3366.0960
1252	598111.6887	1495906.4592	825.58	SD 06 017	1978.1168	3380.8385
1253	598075.0115	1495983.1087	826.01	SD 06 104	2043.1822	3326.1864
	NOTE: 10" RCP E, D = 2.05', INV = 823.96'					
1254	598083.5021	1496009.3688	826.11	SD 06 103	2046.2981	3298.7643
	NOTE: 10" RCP E&W, D = 2.42', INV = 823.69'					
1255	598035.3264	1496123.2381	821.64	SD 10 106	2137.2107	3214.9668
1257	598051.4667	1496168.0983	818.56	SD 10 007	2141.0438	3167.4457
	NOTE: 33" RCP N, D = 3.84', INV = 814.72'; 33" RCP SW, D = 7.62', INV = 810.94'					
1258	598071.2900	1496219.3386	817.11	SD 10 009	2144.1586	3112.5929
	NOTE: INACCESSIBLE					
1259	598068.8488	1496227.6686	817.94	MH 10 009	2149.8229	3106.0154
1260	598076.7988	1496248.2294	817.93	SD 10 100	2151.0767	3084.0068
	NOTE: 12" RCP S, D = 3.04', INV = 814.89', 18" RCP W, D = 2.80', INV = 815.13'					
1261	598074.4888	1496249.3794	817.61	SD 10 101	2153.6554	3083.9138
	NOTE: 10" RCP N&S, D = 2.30', INV = 815.31'					
1262	598057.7807	1496256.9492	817.56	SD 10 102	2171.9983	3083.9222
	NOTE: 10" RCP SW, D = 1.67', INV = 815.89', 10" RCP N, D = 2.05', INV = 815.51'					
1263	598115.5546	1496384.6697	817.55	SD 10 004	2172.1463	2943.7426
	NOTE: 10" RCP N, D = 2.24', INV = 815.31'					
1264	598132.2997	1496377.4399	817.62	SD 10 003	2153.9101	2943.4093
	NOTE: 10" RCP S, D = 2.94', INV = 814.68', 10" RCP N, D = 3.00', INV = 814.62'					
1265	598141.2088	1496364.5200	817.48	MH 10 001	2140.4595	2951.4949
1266	598156.0084	1496403.6701	820.05	MH 10 002	2143.1547	2909.7277
	NOTE: 33" RCP S, 15" RCP W, DEPTH INACCESSIBLE					
1267	598196.7957	1496482.9905	819.46	MH 08 014	2138.7778	2820.6425
	NOTE: 12" RCP NE, DEPTH INACCESSIBLE, 12" RCP S, D = 5.60', INV = 813.86'					
1268	598257.1916	1496502.7410	824.71	MH 08 013	2091.9353	2777.7063
	NOTE: 12" RCP NE, D = 8.20', INV = 816.51', 12" RCP SW, D = 8.28', INV = 816.43'; 12" RCP W, D = 5.20', INV = 819.51'					
1269	598312.1271	1496548.7215	825.82	SD 08 017	2060.9010	2713.1386
1270	598326.7584	1496517.5916	826.10	MH 08 011	2034.7166	2735.4438
	NOTE: 8" VCP NW, D = 6.30', INV = 819.80', 12" RCP E, D = 8.70', INV = 817.40'; 12" RCP S, D = 9.01', INV = 816.99'					
1271	598208.5845	1496511.1606	822.04	SD 08 016	2139.6791	2790.1185
1272	598156.3254	1496517.8301	814.77	SSO 08 015	2190.0258	2805.6330
	NOTE: 12" RCP, T/CONC PIPE					
1273	598589.6350	1495600.1300	872.29	SD 01 023	1416.3131	3462.3668
	NOTE: 4" VCP W, D = 2.33', INV = 869.96'					
1274	598503.3970	1495696.9100	875.07	MH 01 100	1534.8288	3409.8559
1275	598837.0050	1495638.7600	874.58	MH 01 011	1206.9952	3324.9978
	NOTE: 12" VCP N, D = 4.10', INV = 870.48', 15" RCP SW, D = 4.46', INV = 870.12'; 8" VCP S, D = 3.31', INV = 870.58'; 10" VCP E, D = 4.00', INV = 870.58'					
1276	598902.3120	1495627.9800	874.32	SD 01 012	1143.0679	3307.8365
1277	598909.6610	1495611.0100	874.29	SD 01 013	1129.3649	3320.2549
	NOTE: 10" VCP, D = 2.90', INV = 871.39'					
1278	598014.6090	1495585.7200	795.33	MH 05 005	1934.0275	3713.0346
	NOTE: 12" VCP NE, D = 5.80', INV = 789.53', 10" VCP NE, D = 11.47', INV = 783.86'; 10" VCP SE, D = 11.51', INV = 783.82'					

HORIZONTAL AND VERTICAL LOCATION SURVEYING DATA STORM SEWERS

POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION	SOUTH	WEST
1279	597942.6810	1495644.1400	784.38	SD 05 009	2023.6646	3689.5461
	NOTE: 7" SS SE, D = 1.90', INV = 782.48'					
1280	597911.8430	1495679.2200	783.92	SD 05 007	2066.2400	3670.3385
	NOTE: 18" RCP N, D = 4.48', INV = 779.44', 18" RCP SW, D = 16.44', INV = 767.48'					
1281	598011.4239	1495650.8218	788.50	MH 05 006	1963.8218	3655.0632
1282	597925.3651	1496100.1599	791.52	SD 05 105	2227.8171	3281.4091
	NOTE: 33" RCP S, D = 9.13', INV = 782.39'					
1283	597988.3321	1496319.2402	801.95	MH 10 104	2260.9767	3055.8842
1284	597998.3574	1496369.4002	801.61	SD 10 008	2272.5681	3006.0628
	NOTE: 12" RCP N, D = 1.67', INV = 799.94'					
1285	598032.6346	1496418.3300	802.33	SD 10 006	2261.5654	2947.3432
1286	598045.2007	1496434.7400	803.14	SD 10 005	2256.9006	2927.2078
	NOTE: 15" RCP W, D = 2.34', INV = 800.80'; 15" RCP E, D = 2.42', INV = 800.72'; 4" PVC N, D = 1.90', INV = 801.24'					
1287	598058.3896	1496409.6399	806.79	T/CMP	2234.5208	2944.6177
1288	598113.6800	1496497.0296	808.20	INV/CORR/PVC	2220.2696	2842.1926
1289	598247.5261	1496460.6132	826.26	MH 08 012	2083.3343	2820.0643
	NOTE: 12" RCP W, 8" VCP N, DEPTH INACCESSIBLE; 12" RCP E, D = 5.43', INV = 820.83'					
1290	598464.5567	1496580.9223	826.93	SD 08 009	1935.3880	2620.8447
	NOTE: 15" CI N, D = 5.20', INV = 821.73'; 18" RCP E, D = 5.35', INV = 821.58'; 12" CMP S, D = 5.30', INV = 821.63'					
1291	598463.3536	1496573.3823	826.70	INV CONC PIPE	1933.3688	2628.2083
1292	598507.6677	1496587.0121	829.36	SD 08 008	1898.6432	2597.4896
	NOTE: 12" CI N, D = 3.30', INV = 826.06'; 15" CI S, D = 3.50', INV = 825.86'; 12" CMP E, D = 3.15', INV = 826.21'					
1293	598491.8481	1496461.0622	865.61	SD 08 018	1861.0195	2718.7253
	NOTE: 12" RCP E, D = 6.07', INV = 859.54'					
1294	598495.8610	1496663.2522	819.31	INV CONC PIPE	1940.8903	2532.9363
1295	598609.6463	1496724.4317	826.83	SD 09 100	1862.5413	2430.2161
	NOTE: 15" RCP E, D = 11.89', INV = 814.94'					
1296	598604.7385	1496786.8617	808.79	HW 09 006	1892.8007	2375.3894
	NOTE: 33" RCP E, D = 4.45', INV = 804.34', HEADWALL					
1297	598591.9775	1496771.4817	810.22	SSO 09 100	1898.0685	2394.6673
	NOTE: 15" RCP, INV CONC PIPE					
1298	598722.9434	1496761.5012	835.30	SSO 09 101	1774.6769	2349.6541
	NOTE: 8" STEEL, INV/STEEL/PIPE					
1299	598737.3890	1496276.2001	876.99	SD 03 200	1561.0423	2785.6427
1300	599222.4500	1496337.3200	871.98	SD 03 022	1144.5536	2529.6017
1301	599244.5230	1496386.4700	871.53	SD 04 012	1144.7561	2475.7231
	NOTE: 18" RCP E&W, D = 5.00', INV = 866.53'					
1302	599268.5280	1496439.5000	870.96	SD 04 011	1144.8019	2417.5130
	NOTE: 18" RCP E&W, D = 5.35', INV = 865.61'; 8" VCP SW, D = 5.10', INV = 865.86'					
1303	599308.9670	1496469.2200	867.83	SD 04 013	1120.2522	2373.7420
1304	599216.8760	1496458.5000	871.70	MH 04 010	1199.6895	2421.5476
1305	599330.1670	1496575.6100	867.37	SD 04 014	1144.8957	2268.0965
1306	599074.7982	1496272.6295	873.36	SD 03 018	1252.2940	2649.5097
	NOTE: 12" RCP S, D = 4.32', INV = 869.04'; 12" RCP W, D = 4.70', INV = 868.66'; 12" RCP N, D = 4.80', INV = 868.56'; 12" RCP E, D = 4.45', INV = 868.91'					
1307	599178.3580	1496314.0399	872.63	SD 03 023	1175.0904	2569.0171
1308	599129.6271	1496294.3697	873.01	SD 03 219	1211.3431	2607.0612
1309	599191.2932	1496248.4899	872.40	SD 03 024	1136.2316	2623.3688
1310	597892.9520	1495602.5100	779.84	SSO 05 102	2051.7546	3748.0010
	NOTE: 15" RCP, T/CONC PIPE					
1311	597845.4910	1495716.0800	761.77	MH 05 010	2141.8927	3664.1809
	NOTE: 18" RCP E, D = 3.48', INV = 758.29'; 10" PVC NW, D = 3.46', INV = 758.31'					

HORIZONTAL AND VERTICAL LOCATION SURVEYING DATA STORM SEWERS

POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION	SOUTH	WEST
1312	597754.0940	1496058.8200	745.65	SD 05 018	2366.7133	3389.8093
	NOTE: 42" RCP S, D = 10.36', INV = 735.29', 24" RCP W, D = 10.26', INV = 735.39'					
1313	597757.0620	1495956.0900	744.29	SD 05 019	2321.5724	3482.1378
	NOTE: 12" CMP NE, D = 3.44', INV = 740.85', 24" RCP W, D = 7.89', INV = 736.40'; 24" RCP E, D = 8.05', INV = 736.24'					
1314	597758.2560	1495903.6100	744.00	SD 05 020	2298.8054	3529.4373
	NOTE: 24" RCP N, D = 3.42', INV = 740.58', 24" RCP E, D = 7.17', INV = 736.83'; 24" RCP W, D = 7.62', INV = 736.38'					
1315	597815.8586	1495904.1002	756.15	SD 05 023	2246.5501	3505.1950
	NOTE: 24" RCP W, D = 5.60', INV = 750.55', 24" RCP S, D = 6.28', INV = 749.87'					
1316	597825.3940	1495781.4703	756.30	SD 05 022	2187.2076	3612.9331
	NOTE: 18" RCP W, D = 3.33', INV = 752.97', 24" RCP E, D = 4.00', INV = 752.30'					
1317	597857.4101	1496094.2003	779.95	SSO 05 008	2287.2407	3314.9088
	NOTE: 33" RCP NW; 12" CMP SW, INV CONC PIPE					
1318	598845.3361	1496935.1598	818.50	SSO 09 013	1734.9547	2140.9451
	NOTE: 24" CMP, T/CMP					
1319	598935.8692	1497025.7288	814.82	SD 11 100	1689.9219	2021.0659
	NOTE: 24" RCP S, D = 2.88', INV = 811.94'					
1320	598938.1352	1497023.1287	817.68	SSO 11 200	1686.7842	2022.4976
	NOTE: 24" CMP, T/CMP					
1321	599186.8070	1495985.7400	875.78	SD 03 104	1031.7744	2864.5043
	NOTE: 4" CI S, D = 3.55', INV = 872.23', 12" RCP N, D = 5.65', INV = 870.13'					
1322	599158.3950	1495944.4900	875.11	SD 02 019	1040.6083	2913.8071
1323	599118.7060	1495963.7500	874.91	SD 02 020	1084.7088	2912.6630
1324	599104.5350	1495839.1800	875.28	SD 02 017	1046.1539	3031.9610
1325	599042.1020	1495807.0600	874.90	SD 02 015	1089.7418	3087.0034
	NOTE: 10" N, DEPTH INACCESSIBLE					
1326	599078.9760	1495790.7200	875.91	MH 02 016	1049.4111	3086.6513
	NOTE: 8" RCP E, D = 4.52', INV = 871.39', 8" RCP S, D = 4.54', INV = 871.37'; 10" RCP W, D = 4.58', INV = 871.33'					
1327	598975.9450	1495714.7000	874.75	SD 02 014	1111.8358	3198.4439
1328	598993.8250	1495699.6900	875.89	MH 02 013	1089.3521	3204.7270
	NOTE: 10" RCP E, D = 5.12', INV = 870.77', 10" VCP NW, D = 5.50', INV = 870.39'; 8" RCP S, D = 5.20', INV = 870.69'					
1329	599168.3460	1495852.4500	875.33	SD 02 018	993.5241	2993.5157
	NOTE: 12" CMP N, D = 1.50', INV = 873.83'					
1330	599180.2710	1495846.9700	873.02	SSO 02 104	980.4004	2993.5800
	NOTE: 12" CMP, INV/CMP					
1331	599017.4280	1495642.0400	869.19	SSO 02 101	1044.0418	3247.4775
	NOTE: 10" VCP, INV/CMP					
1332	599159.3907	1496007.8198	872.62	SD 03 103	1065.8633	2855.7223
1333	599206.4629	1495982.6202	875.52	SD 03 028	1012.5853	2859.2256
	NOTE: 12" RCP S, D = 3.53', INV = 871.99', 12" RCP E, D = 4.06', INV = 871.46'; 12" RCP SW, D = 3.94', INV = 871.58'; 4" PVC SE, D = 3.53', INV = 871.99'					
1334	599253.9916	1496086.5496	874.52	MH 03 027	1012.2352	2744.9445
	NOTE: 12" RCP E&W, D = 4.18', INV = 870.34'					
1335	599274.0204	1496131.0597	873.97	MH 03 026	1012.3825	2696.1359
	NOTE: 12" RCP W, D = 4.00', INV = 869.97', 12" RCP S, D = 4.34', INV = 869.63'					
1336	599413.4706	1496498.7603	868.58	SD 04 015	1037.2855	2303.6693

HORIZONTAL AND VERTICAL LOCATION SURVEYING DATA SANITARY SEWERS

POINT	NORTHING	EASTING	ELEVATION	ID NUMBER	SOUTH	WEST
1015	598952.4150	1496192.2600	878.20	03 011	1330.5456	2773.2578
1016	598994.6770	1496139.8700	877.48	03 002	1270.4158	2803.5100
1017	598974.7120	1496123.4300	877.36	03 003	1281.8062	2826.7292
1018	598965.4600	1496103.5100	877.53	03 004	1282.0028	2848.6921
1019	599034.8360	1496120.3100	877.93	03 001	1225.7633	2804.7332
1020	599000.6900	1496296.4600	878.38	03 012	1329.6276	2658.4219
1021	598935.5911	1495983.2499	878.08	02 008	1259.5242	2970.5500
1022	598922.4860	1495965.3800	878.03	02 009	1264.0767	2992.2376
1023	598843.4500	1495978.5403	877.97	02 005	1341.4900	3012.9027
1024	598801.0921	1495998.6804	877.99	02 006	1388.3847	3012.0596
1025	598991.9330	1495964.9897	877.90	02 007	1200.6711	2963.9043
1026	598863.0692	1495781.6505	877.39	02 012	1242.2875	3184.1024
1027	598812.6070	1496032.3900	878.05	02 014	1391.8238	2976.6040
	NOTE: 8" VCP S&W, D = 7.84', INV = 870.21'					
1028	598810.5730	1496016.2300	878.09	02 010	1387.0004	2992.1609
1029	598690.5110	1495895.7800	878.08	02 001	1446.5807	3151.4508
1030	598713.8290	1495946.1100	877.47	02 002	1446.1368	3095.9833
1031	598806.1470	1496148.2500	877.43	03 008	1445.5689	2873.7607
	NOTE: 8" VCP E&W, D = 7.01', INV = 870.42'					
1032	598812.2350	1496160.8500	878.18	03 007	1445.2297	2859.7711
	NOTE: 8" VCP E&W, D = 7.72', INV = 870.46'; 10" DIP N, D = 7.67', INV = 870.51'					
1033	598816.4360	1496170.7100	877.51	03 009	1445.4771	2849.0563
1034	598872.2019	1496136.3809	877.82	03 006	1380.5106	2857.2822
	NOTE: 10" DIP S, D = 5.95', INV = 871.87'; 10" VCP NE, D = 5.86', INV = 871.96'; 6" VCP W, D = 4.05', INV = 873.77'					
1035	598908.1410	1496130.0716	877.83	03 005	1345.1750	2848.1815
1036	598725.9163	1496304.7804	877.92	08 001	1583.2969	2764.3544
1037	598834.5880	1496383.7004	876.27	03 100	1516.9333	2647.5906
	NOTE: 4" CIP S&E, D = 1.61', INV = 874.66'					
1038	598890.2162	1496498.1898	874.82	03 14	1513.5695	2520.3467
1039	598836.1714	1496523.4804	875.00	08 003	1573.2348	2519.6411
	NOTE: 8" VCP N, D = 10.87', INV = 864.13'; 6"VDP E, D = 10.73', INV = 864.27'					
1040	598964.5459	1496662.8291	867.07	04 007	1513.8916	2339.7066
1041	599004.0343	1496704.8287	866.80	04 006	1495.2802	2285.1454
1042	599130.1989	1496589.4401	870.94	04 005	1332.7167	2338.1090
1043	599282.3359	1496581.9098	867.82	04 002	1191.0572	2282.1185
1044	599364.3509	1496540.9097	868.19	04 001	1099.4302	2285.5761
1045	599170.5950	1496386.2600	872.61	03 013	1211.9944	2506.4542
1046	598580.4930	1496304.4400	877.93	08 002	1715.5910	2824.7392
	NOTE: 6" VCP SW, D = 2.78', INV = 875.15'; 4" PVC SE, D = 2.51', INV = 875.42'; 6" VCP N, D = 2.98', INV = 874.95'					
1047	598715.3110	1496243.1200	877.95	03 010	1567.4829	2824.8887
	NOTE: 8" VCP NW&SE, D = 6.25', INV = 871.70'; 6" VCP S, D = 5.51', INV = 872.44'					
1048	598371.1720	1496017.7100	876.79	07 001	1787.7674	3172.3309
	NOTE: 5" IRON N, D = 9.16', INV = 867.63'; 4" CIP N, D = 9.09', INV = 867.70'; 8" VCP SW, D = 9.35', INV = 867.44'					
1049	598167.7080	1496085.0000	870.78	10 001	2000.8566	3195.1025
1050	598253.8610	1495897.0900	859.73	06 005	1844.7722	3330.6391
1051	598261.2470	1495706.8700	849.92	06 004	1759.4655	3500.8183
	NOTE: 8" VCP NE, DEPTH INACCESSABLE; 8" VCP NW, D = 5.59', INV = 844.33'; 8" VCP NE&NW&SW, D = 13.30', INV = 836.62'					
1052	598261.0480	1495687.6800	845.82	06 003	1751.7193	3518.3766
1053	598247.9450	1495593.6500	848.16	06 008	1724.8079	3609.4211
	NOTE: 8" PVC W&S, D = 11.05', INV = 837.11'					
1054	598179.0140	1495575.4500	829.59	05 001	1780.0638	3654.4711

HORIZONTAL AND VERTICAL LOCATION SURVEYING DATA SANITARY SEWERS

POINT	NORTHING	EASTING	ELEVATION	ID NUMBER	SOUTH	WEST
1055	598134.8040	1495546.5800	816.09	05 002	1808.3989	3699.0259
1056	598112.1110	1495661.1800	817.55	05 004	1876.4066	3604.0360
1066	598632.5830	1495767.5596	877.82	01 004	1446.3666	3292.1493
1067	598505.1673	1495588.2291	872.73	01 003	1488.3202	3508.0986
1068	598414.8150	1495484.6300	858.59	01 002	1527.8055	3639.7694
1069	598374.2890	1495444.5000	855.30	01 001	1548.1341	3693.0566
1070	598299.2400	1495504.4800	854.21	06 007	1641.2580	3669.4367
1071	598366.9360	1495631.1300	871.57	06 002	1631.9278	3526.1331
	NOTE: 8" VCP N&SE, D = 13.40', I = 858.17'					
1072	598393.6270	1495639.3700	872.94	06 001	1611.0247	3507.6030
	NOTE: 8" VCP N&S, D = 11.77', I = 861.17'; 4" PVC N, D = 1.48', I = 871.46'; 10" VCP NE, D = 11.89', I = 861.05'; 8" VCP NE, D = 9.19', I = 863.75'; 8" VCP N, D = 7.61', I = 865.33'; 6" PVC W, D = 11.00', I = 861.94'					
1073	598909.0542	1496686.3911	861.99	09 001	1574.1605	2341.1728
1074	598860.4732	1496690.1618	857.15	09 004	1619.9601	2357.8077
1075	598918.3749	1496730.3809	860.65	09 002	1583.8446	2297.2615
	NOTE: BOLTED SHUT					
1076	598882.1210	1496737.5015	858.96	09 003	1619.8020	2305.7535
	NOTE: 6" CIP NW, D = 4.10', I = 854.86'; 6" CIP E&W, D = 4.91', I = 854.05'; 6" CIP SW, D = 4.80', I = 854.16'					
1077	598870.7864	1496765.2217	845.14	09 005	1641.5755	2285.1915
1078	598797.4092	1496816.7028	837.89	09 007	1729.6660	2268.6208
1079	598127.1094	1496268.0004	828.68	10 005	2113.4271	3045.2183
1080	598147.4454	1496266.9206	833.81	10 004	2094.4613	3037.8008
1081	598213.7571	1496324.8009	826.36	10 003	2057.9828	2957.6965
	NOTE: 6" NE&E, D = 3.08', I = 823.28'; 8" S, D = 3.08', I = 823.28'					
1082	598241.1171	1496320.0910	826.50	10 002	2031.1208	2950.6832
	NOTE: 8" N&SW, D = 3.43', I = 823.07'					
1083	597994.8690	1495526.1700	795.44	05 008	1927.4041	3775.4205
	NOTE: 8" CIP N, D = 8.90', I = 786.54'; 8" VCP E&W, D = 10.36', I = 785.08'; 10" VCP SW, D = 10.77', I = 784.67'					
1084	598012.6800	1495442.6100	795.02	05 007	1876.6650	3844.1595
	NOTE: 8" PVC NE, D = 6.96', I = 788.06'; 8" VCP NE&SW, D = 8.60', I = 786.42'; 8" VCP E, D = 8.60', I = 786.42'					
1085	597980.5900	1495394.7500	790.23	05 009	1886.1178	3901.0013
	NOTE: 8" VCP NE&SW, D = 5.34', I = 784.89'					
1086	598063.6550	1495532.4500	802.79	05 006	1867.3561	3741.2857
	NOTE: 8" VCP E&SW, D = 4.23', I = 798.56'					
1094	598004.5870	1495696.5800	818.68	05 011	1988.9509	3616.2162
1095	598046.1690	1495687.6100	830.74	05 010	1947.3773	3607.2074
1096	598067.3580	1495742.1600	830.55	06 009	1950.6156	3548.7764
1100	598074.6340	1496005.3200	824.57	06 12	2052.7016	3306.1149
1101	598090.8160	1496050.4000	823.44	10 006	2056.5876	3258.3764
1118	598010.4740	1496214.8300	818.25	10 009	2197.6803	3141.8221
1119	598044.5870	1496180.2100	819.22	10 008	2152.3125	3159.2578
1121	598038.3569	1496103.9504	825.77	D	2126.4831	3231.2799
1256	598069.3653	1496129.2086	826.72	10 X	2108.6784	3195.4680

APPENDIX D

APPENDIX D

MOUND PLANT PRECIPITATION DATA
JANUARY, 1994 - AUGUST, 1994

APPENDIX D
MOUND PLANT PRECIPITATION DATA
JANUARY, 1994 - AUGUST, 1994
(inches)

Date	January	February	March	April	May	June	July	August
1								
2	0.11			0.34				
3					0.04			
4	0.18							0.47
5								
6				0.60	0.25			
7	0.10		0.06		0.44	0.80		
8	0.15	0.19					0.29	
9				0.41			0.02	
10			0.33	2.30				
11				1.00				
12	0.15	0.32			0.16			
13		0.10	0.13			0.03	0.64	
14		0.09			0.23			
15				0.30	0.07		0.05	
16								
17	1.00							
18			0.04					
19			0.05					
20	0.30	0.09					0.51	0.42
21							1.05	
22	0.12	0.11						
23	0.04	0.42				0.15		
24						0.02		
25	0.56	0.06			0.02			
26						1.37		
27	0.48			0.11			0.25	0.09
28	0.65			0.43		0.01	1.22	
29				0.55			0.23	
30				0.90			0.01	
31								

Note: Blocks without data are days when precipitation did not fall.

Source: Mound Plant Precipitation Gauge

APPENDIX E

APPENDIX E

SURFACE WATER DRAINAGE MAP
AND POTENTIAL AREAS OF INFILTRATION AND LEAKAGE

APPENDIX F

APPENDIX F

OU-2 SUMP AND TANK DATABASE

APPENDIX F
OU-2 SUMP AND TANK DATABASE
Page 1 of 9

ID	Building	Room/Location	Reference	OU-2 Category 1.)	Capacity (gallons)	Mound Program	Primary Regulatory Jurisdiction	Spill Jurisdiction	Tank Material	Status	Date Installed
2	H	Rm H-133	a,b	--	900	D&D	AEA	AEA	s/s lined concrete	inactive	1947
3	WD	Deck	a,b	IV	500	AUSTP	AEA	AEA	steel lined concrete	in service	1947
4	WD	Deck	a,b	IV	30,000	AUSTP	AEA	AEA	steel lined concrete	in service	1947
5	WD	Deck	a,b	IV	30,000	AUSTP	AEA	AEA	steel lined concrete	in service	1947
6	WD	Deck	a,b	IV	30,000	AUSTP	AEA	AEA	concrete	in service	1947
7	WD	Dock 2	a,b	IV	30,000	AUSTP	CWA	AEA	concrete	in service	1947
8	WD	Dock 2	a,b	IV	30,000	AUSTP	CWA	AEA	concrete	in service	1947
9	WD	Dock 2	a,b	IV	30,000	AUSTP	CWA	AEA	concrete	in service	1947
10	WD	Dock 2	a,b	IV	30,000	AUSTP	CWA	AEA	concrete	in service	1947
11	WD	Annex	a,b	IV	30,000	AUSTP	AEA	AEA	steel lined concrete	in service	1966
12	WD	Rm 1/Basement	a,b	IV	600	AUSTP	AEA	AEA	steel lined concrete	in service	1947
13	WD	Annex	a,b	IV	600	AUSTP	AEA	AEA	steel lined concrete	in service	1966
14	WD	Annex	a,b	IV	3,750	AUSTP	AEA	AEA	steel lined concrete	in service	1966
15	WD	Annex	a,b	IV	3,750	AUSTP	AEA	AEA	steel lined concrete	in service	1966
16	WD	Annex	a,b	IV	3,750	AUSTP	AEA	AEA	steel lined concrete	in service	1966
17	WD	Rm 01/sub-basement	a,b	IV	3,750	AUSTP	CWA	AEA	steel lined concrete	in service	1947
18	WD	Rm 8	a,b	IV	500	AUSTP	CWA	AEA	concrete	in service	1947
19	R	Rm 128	a,b	IV	450	AUSTP	AEA	AEA	double fiberglass set in concrete	in service	1981
20	SW	Rm SW 8	a,b	IV	500	AUSTP	AEA	AEA	s/s lined steel	in service	1950
21	SW	Rm SW 125	a,b	IV	200	AUSTP	AEA	AEA	s/s lined steel	in service	1965
22	SW	Rm SW 143	a,b	IV	100	AUSTP	AEA	AEA	s/s lined steel	in service	1965
23	SW	Rm SW 137	a,b	IV	100	D&D	AEA	AEA	stainless steel	inactive	1950
24	HH	outside Rm H-21	a,b	III	200	AUSTP	AEA	AEA	steel lined concrete	in service	1974
28	A	Rm A-10	a,b	IV	200	AUSTP	AEA	AEA	PVC lined steel	in service	1968
29	A	Rm A-10	a,b	IV	400	AUSTP	AEA	AEA	PVC lined steel	in service	1968
113	P	--	a,b	IV	400	AUSTP	AEA	AEA	bare steel w/ coating	in service	1947
114	P	--	a,b	IV	25,000	AUSTP	AEA	CWA	bare steel w/ coating	in service	1947
115	P	--	a,b	IV	25,000	AUSTP	AEA	CWA	bare steel w/ coating	in service	1965
116	P	--	a,b	IV	25,000	AUSTP	AEA	CWA	bare steel	in service	1965
117	R	R/S/T Bldg Stack	a,b	IV	25,000	AUSTP	BUSTR	CWA	bare steel with coating	in service	1971
119	M	Rm M-108	a,b	IV	5,000	AUSTP	CWA	BUSTR	concrete	in service	1980
120	R	Corridor 2	a,b	IV	250	AUSTP	CWA	AEA	s/s	in service	--
124	T	Rm T-1	a,b	IV	500	AUSTP	CWA	AEA	steel lined concrete	in service	1947
125	T	Corridor 2	a,b	IV	350	AUSTP	CWA	AEA	steel lined concrete	in service	1947

REFERENCES:

a) DOE, 1992. "Mound Plant Underground Storage Tank Program Plan and Regulatory Status Review"
b) EG&G, 1994. "Active Underground Storage Tank Plan", May 16, 1994 (Dames & Moore)
c) ICF KE field investigation

LEGEND:

NA = Not Applicable
-- = Information not available
AEA = Atomic Energy Act
CWA = Clean Water Act
BUSTR = Bureau of Underground Storage Tanks Regulations
FFA = Federal Facility Agreement
D&D = Decontamination and Decommissioning
ER = Environmental Restoration
AUSTP = Active Underground Storage Tank Program
s/s = stainless steel
ww = wastewater
PVC = poly vinyl chloride
Bldg. = Building

NOTES:

1.) Category I = Included in the OU-2 scope of work.
Category II = No further action is required, not included in the OU-2 field scope of work.
Category III = Included in the OU-2 scope of work, requires more data to be evalauted.
Category IV = Areas under other programs, not in included in the OU-2 field scope of work.

File: APP-F.WK3-DATA-E
Project: 50942-002-00

APPENDIX F
OU-2 SUMP AND TANK DATABASE
Page 2 of 9

ID	Purpose	Tank Cathodic Protection	Inlet of Tank	Outlet of Tank	Spills	Spill Overflow Protection	Piping Material
2	laundry (rad) water sump	none	alpha ww from laundary floor drains	H Bldg. to WD Bldg.	No	ball float switch	--
3	alpha influent storage	epoxy lining	H Bldg. SWR, PP; WD basement, WDA	to two 60,000 gal. clarifiers	No	high level alarm	bare steel
4	alpha influent storage	epoxy lining	H Bldg. SWR, PP; WD basement, WDA	to two 60,000 gal. clarifiers	No	high level alarm	--
5	alpha influent storage	PVC lined	H Bldg. SWR, PP; WD basement, WDA	to two 60,000 gal. clarifiers	No	high level alarm	--
6	alpha influent storage	epoxy lining	WDA, H Bldg., WD basement	to two 60,000 gal. clarifiers	No	high level alarm	--
7	alpha effluent storage	epoxy lining	WD Building	collect and test prior to discharge	No	datalogger from level indicator	bare steel
8	alpha effluent storage	epoxy lining	WD Building	collect and test prior to discharge	No	datalogger from level indicator	--
9	alpha effluent storage	epoxy lining	WD Building	collect and test prior to discharge	No	datalogger from level indicator	--
10	alpha effluent storage	epoxy lining	WD Building	collect and test prior to discharge	No	datalogger from level indicator	--
11	hot sump	PVC lining	ww from floor/sink drains from WDA	Tanks 15 and 16	No	on/off ball float switch	bare steel
12	alpha wastewater sump	none	Tank 17/18,floor/sink drains in WD Bldg.	Influent tanks 3,4,5,6	No	on/off ball float switch	bare steel
13	beta influent storage	none	Piping SW/R complex, drains from T Bldg.	pump/in-house drumming	No	none	--
14	beta influent storage	none	Piping SW/R complex, drains from T Bldg.	pump/in-house drumming	No	none	--
15	alpha influent storage	none	WD Annex basement wash sump	Alpha influent tank 3,4,5,6	No	none	--
16	alpha influent storage	none	WD Annex basement wash sump	Alpha influent tank 3,4,5,6	No	none	--
17	alpha ww sump	none	WD Building floor drains	Tank 12	No	on/off ball float switch	--
18	alpha ww sump	vitrified clay	drains in alpha ww treatment system	Tank 12	No	ball float switch	--
19	alpha ww tank	none	alpha ww R Bldg.	WD Alpha ww influent tank	No	high level alarm/auto shut off	--
20	beta ww tank	none	Rm 8,13,and 19	Tanks 13 and 14	No	high level alarm/ball float on/off	--
21	beta ww tank	none	Rm SW-125 beta ww	WDA Bldg. Tanks 13 and 14	No	high level alarm/ball float on/off	--
22	beta ww tank	none	SW Bldg. beta ww	AST 13 and 14	No	high level alarm/ball float on/off	cast iron
23	alpha ww sump	none	collect from "hot cell" to process	pumped to 30 gallon drums sent WD Bldg.	No	on/off ball float switch	--
24	beta ww tank	none	H bldg process area, sinks and drains	Beta treatment, WD Bldg. Tanks 13,14	No	none	cast iron
28	medical decon shower tank	none	ww from med. decon shower	rad to WD Bldg. non-rad Bldg. 57	No	high level alarm	bare steel
29	medical decon shower tank	none	ww from med. decon shower	rad to WD Bldg. non-rad Bldg. 57	No	high level alarm	bare steel
113	fuel oil tank (tank 1)	--	fill line	standby electric generator	Yes	none	bare steel
114	fuel oil tank (tank 2)	--	fill line	standby electric generator	Yes	none	bare steel
115	fuel oil tank (tank 3)	--	fill line	standby electric generator	Yes	none	bare steel
116	fuel oil tank (tank 4)	--	fill line	standby electric generator	Yes	none	bare steel
117	diesel fuel storage	none	fill cap	supply fuel emergency generator No. 1	No	none	bare steel
119	metal plating rinse tank	epoxy	H Bldg.	Bldg. 57	No	none	bare steel
120	sanitary waste tank	none	R Bldg.	Bldg. 57	No	high level alarm ball float switch	--
124	cooling water sump	none	cooling systems T Bldg.	stormwater system	No	on/off float level switch	bare steel
125	sanitary waste sump	none	restroom T Bldg.	Bldg. 57	No	on/off float level switch	bare steel

REFERENCES:

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OU-2 SUMP AND TANK DATABASE
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ID	Substance Last or Currently Stored	Tank Site Description	Date Inspected	Tank Release Detection Method	Piping Release Detection Method	Closure Date	Map Available	Notes
2	radioactive ww	indoor	4/19/94	none	none	1991	No	--
3	radioactive water	indoor	4/11/94	second. containment w/interstitial monitoring	none	NA	Yes	--
4	radioactive water	indoor	4/11/94	second. containment w/interstitial monitoring	none	NA	Yes	--
5	radioactive water	indoor	4/11/94	second. containment w/interstitial monitoring	none	NA	Yes	--
6	radioactive water	indoor	4/11/94	second. containment w/interstitial monitoring	none	NA	Yes	--
7	radioactive water	indoor	4/11/94	none	none	NA	Yes	--
8	radioactive water	indoor	4/11/94	none	none	NA	Yes	--
9	radioactive water	indoor	4/11/94	none	none	NA	Yes	--
10	radioactive water	indoor	4/11/94	none	none	NA	Yes	--
11	radioactive water	indoor	4/11/94	none	none	NA	Yes	--
12	radioactive water	indoor	4/11/94	none	none	NA	Yes	--
13	radioactive water	indoor	4/11/94	none	none	NA	Yes	--
14	radioactive water	indoor	4/11/94	none	none	NA	Yes	--
15	radioactive water	indoor	4/11/94	none	none	NA	Yes	--
16	radioactive water	indoor	4/11/94	none	none	NA	Yes	--
17	radioactive water	indoor	4/11/94	none	none	NA	Yes	--
18	radioactive water	indoor	4/11/94	none	none	NA	Yes	--
19	radioactive ww	indoor	4/18/94	none	none	NA	Yes	--
20	radioactive ww	indoor	4/18/94	second. containment w/interstitial monitoring	none	NA	No	--
21	radioactive ww	indoor	4/20/94	second. containment w/interstitial monitoring	none	NA	No	--
22	radioactive ww	indoor	4/20/94	second. containment w/interstitial monitoring	none	NA	No	--
23	radioactive ww	indoor	4/20/94	none	none	--	No	--
24	radioactive ww	indoor	4/20/94	none	none	NA	Yes	--
28	decon water	outdoor	4/15/94	none	none	NA	Yes	--
29	decon water	outdoor	4/15/94	none	none	NA	Yes	--
113	fuel oil No. 2	outdoor	4/21/94	monthly inventory control/manual tank gauge/annaul tightness test	line tightness test	NA	Yes	intended replacement. May 1995
114	fuel oil No. 2	outdoor	4/21/94	monthly inventory control/manual tank gauge/annaul tightness test	line tightness test	NA	Yes	intended replacement. May 1995
115	fuel oil No. 2	outdoor	4/21/94	monthly inventory control/manual tank gauge/annaul tightness test	line tightness test	NA	Yes	intended replacement. May 1995
116	fuel oil No. 2	outdoor	4/21/94	monthly inventory control/manual tank gauge/annaul tightness test	line tightness test	NA	Yes	intended replacement. May 1995
117	diesel	outdoor	4/18/94	tank tightness test	line tightness test	NA	No	--
119	industrial ww	outdoor	4/19/94	none	none	NA	No	--
120	sanitary ww	indoor	4/19/94	none	none	NA	No	--
124	cooling water	indoor	4/14/94	none	none	NA	No	--
125	sanitary ww	indoor	4/14/94	none	none	NA	No	--

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APPENDIX F
OU-2 SUMP AND TANK DATABASE
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ID	Building	Room/Location	Reference	OU-2 Category 1.)	Capacity (gallons)	Mound Program	Primary Regulatory Jurisdiction	Spill Jurisdiction	Tank Material	Status	Date Installed
126	T	Rm T-11 F	a,b	IV	350	AUSTP	CWA	AEA	steel lined concrete	in service	1947
127	T	Rm T-15 A	a,b	IV	350	AUSTP	CWA	AEA	steel lined concrete	in service	1947
128	T	Stair 3	a,b	IV	350	AUSTP	CWA	AEA	steel lined concrete	in service	1947
129	T	Rm T-78	a,b	IV	350	AUSTP	CWA	AEA	steel lined concrete	in service	1947
130	T	Corridor 8	a,b	IV	350	AUSTP	CWA	AEA	steel lined concrete	in service	1947
131	T	Rm T-78B	a,b	IV	350	AUSTP	CWA	AEA	steel lined concrete	in service	1947
132	T	Rm T-90	a,b	IV	350	AUSTP	CWA	AEA	steel lined concrete	in service	1947
133	T	Rm T-99	a,b	IV	350	AUSTP	CWA	AEA	steel lined concrete	in service	1947
134	WD	Rm 01	a,b	IV	350	AUSTP	CWA	AEA	steel lined concrete	in service	1947
135	WD	Annex Rm-9	a,b	IV	400	AUSTP	CWA	AEA	concrete	in service	1967
202	G	--	a,b	IV	400	ER	FFA	AEA	bare steel	removed	1947
203	G	--	a,b	I	4,000	ER	FFA	FFA	bare steel	removed	1964
204	G	--	a,b	I	4,000	ER	FFA	FFA	bare steel	removed	1975
205	Old SD	--	a,b	I	5,000	D&D	AEA	FFA	concrete	inactive	1947
206	Old SD	--	a,b	IV	7,500	D&D	AEA	AEA	concrete	inactive	1947
207	Old SD	--	a,b	IV	30,000	D&D	AEA	AEA	concrete	inactive	1947
208	41	--	a,b	IV	7,500	D&D	AEA	AEA	s/s lined steel	removed	1968
209	41	--	a,b	--	3,466	D&D	AEA	AEA	s/s lined steel	removed	1968
214	WD	Annex	a,b	--	3,466	D&D	AEA	AEA	bare steel	inactive	1968
215	WD	Annex	a,b	IV	3,750	D&D	AEA	AEA	bare steel	inactive	1968
216	WD	Annex	a,b	IV	3,750	D&D	AEA	AEA	bare steel	inactive	1968
222	58	--	a,b	IV	3,750	ER	FFA	AEA	bare steel	removed	1973
223	56	--	a,b	I	3,000	ER	FFA	FFA	bare steel	removed	1972
225	M	Rm M-38	a,b	I	825	ER	FFA	FFA	concrete	inactive	1969
226	SW	Rm SW-10	a,b	IV	350	D&D	AEA	FFA	s/s	inactive	1967
227	T	Rm T-23	a,b	I	100	D&D	AEA	AEA	steel lined concrete	closed in place	1947
228	T	Rm T-3	a,b	III	350	D&D	AEA	AEA	s/s lined concrete	closed in place	1947
229	T	Rm T-40	a,b	III	350	D&D	AEA	AEA	steel lined concrete	closed in place	1947
230	T	Rm T-41	a,b	III	350	D&D	AEA	AEA	steel lined concrete	closed in place	1947
231	T	Rm T-50	a,b	III	350	D&D	AEA	AEA	acid proof brick with 1/4" portite cement joints	closed in place	1947
232	T	Rm T-50	a,b	III	60	D&D	AEA	AEA	steel lined concrete	closed in place	1947
233	T	Corridor 8	a,b	III	350	D&D	AEA	AEA	steel lined concrete	closed in place	1947
234	T	Corridor 7	a,b	III	350	D&D	AEA	AEA	steel lined concrete	closed in place	1947
235	T	Rm T-63	a,b	III	350	D&D	AEA	AEA	steel lined concrete	closed in place	1947
236	HH	Rm HH-15	a,b	III	350	D&D	AEA	AEA	steel lined concrete	inactive	1967

REFERENCES:
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APPENDIX F
OU-2 SUMP AND TANK DATABASE

ID	Purpose	Tank Cathodic Protection	Inlet of Tank	Outlet of Tank	Spills	Spill Overflow Protection	Piping Material
126	sanitary waste sump	none	non-work area floor and sink drains	Bldg. 57	No	on/off float level switch	bare steel
127	sanitary waste sump	none	restroom and non-work area T Bldg.	Bldg. 57	No	on/off float level switch	bare steel
128	cooling water sump	none	cooling water/condensate, T Bldg.	storm water system	Flooding	on/off float level switch	bare steel
129	condensate sump	none	Steam condensate, T Bldg.	storm water discharge	No	on/off float level switch	bare steel
130	sanitary waste sump	none	restroom and non-work area T Bldg.	Bldg. 57	No	on/off float level switch	bare steel
131	sanitary waste sump	none	sanitary ww from restroom	Bldg. 57	No	on/off float level switch	bare steel
132	cooling system condensate sump	none	cooling units, air handling T Bldg.	stormwater system	No	on/off float switch	bare steel
133	sanitary waste sump	none	restrooms in T Bldg.	Bldg. 57	No	on/off float level switch	bare steel
134	sanitary waste sump	none	collect sanitary waste	Bldg. 57	No	on/off float level switch	bare steel
135	sanitary waste sump	none	shower and toilet, WDA	Bldg. 57	No	on/off float level switch	bare steel
202	leaded gasoline storage	none	NA	NA	Yes	NA	NA
203	leaded gasoline storage	none	NA	NA	Yes	NA	NA
204	unleaded gasoline storage	none	NA	NA	Yes	NA	NA
205	sanitary waste treatment (primary settling)	none	sanitary waste from operations	--	Yes	--	--
206	sanitary waste treatment (aeration)	none	sanitary waste from OPS	--	Yes	--	--
207	sanitary waste treatment (digester)	none	sanitary waste from site	operations replaced w/ Bldg. 57	Yes	--	--
208	alpha ww pump station	none	ww PP and SW Bldgs.	WD Bldg.	Yes	NA	cast iron
209	alpha ww pump station	none	ww PP and SW Bldgs.	WD Bldg.	Yes	NA	cast iron
214	alpha effluent tank	PVC liner	--	--	No	--	--
215	alpha effluent tank	PVC liner	--	--	No	--	--
216	alpha effluent tank	PVC liner	--	--	No	--	--
222	diesel fuel storage tank	none	fill cap	emergency generator, Bldg 58	No	NA	--
223	diesel fuel storage tank	none	fill cap	emergency generator, Bldg 56	No	NA	--
225	metal plating rinse sump	none	M Bldg. metal rinse drains	Bldg. 57	No	none	bare steel
226	beta ww sump	none	SW-10 lab floors	WD Bldg. tanks 13, 14	No	none	cast iron
227	beta ww sump	none	Bldg. T, beta ww	WD Bldg.	No	NA	NA
228	floor drain sump	none	--	SD Bldg.	No	none	NA
229	alpha ww sump	none	collect alpha ww from floor drains	WD Bldg.	No	NA	NA
230	alpha ww sump	none	T Bldg.	WD Bldg.	No	NA	NA
231	alpha ww sump	none	T Bldg.	WD Bldg.	No	NA	NA
232	alpha ww sump	none	alpha process ww	WD Bldg.	No	NA	NA
233	alpha ww sump	none	collect alpha ww from floor drains	WD Bldg.	No	NA	NA
234	alpha ww sump	none	collect alpha ww from floor drains	WD Bldg.	No	NA	NA
235	alpha ww sump	none	collect alpah ww from floor drains	WD Bldg.	No	NA	NA
236	beta ww sump	none	beta ww from sink, restrooms and drains	WD Bldg. Tanks 13,14	No	on/off ball float switch	cast iron

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APPENDIX F
OU-2 SUMP AND TANK DATABASE
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ID	Substance Last or Currently Stored	Tank Site Description	Date Inspected	Tank Release Detection Method	Piping Release Detectio	Closure Date	Map Available	Notes
126	sanitary ww	indoor	4/14/94	none	none	NA	No	--
127	sanitary ww	indoor	4/14/94	none	none	NA	No	--
128	cooling water	indoor	4/14/94	none	none	NA	No	--
129	condensate water	indoor	4/14/94	none	none	NA	No	--
130	sanitary ww	indoor	4/14/94	none	none	NA	No	--
131	sanitary ww	indoor	4/14/94	none	none	NA	No	--
132	condensate water	indoor	4/14/94	none	none	NA	No	--
133	sanitary ww	indoor	4/14/94	none	none	NA	No	--
134	sanitary ww	indoor	4/11/94	none	none	NA	Yes	--
135	sanitary ww	indoor	4/11/94	none	none	NA	Yes	--
202	gasoline	NA	4/14/94	NA	NA	1964	No	removed 1986
203	gasoline	NA	4/14/94	NA	NA	1964	No	removed 1986
204	gasoline	NA	4/14/94	NA	NA	1986	No	removed 1986
205	sanitary ww	outdoor	4/15/94	none	none	1975	Yes	scheduled for D&D
206	sanitary ww	outdoor	4/15/94	none	none	1975	Yes	scheduled for D&D
207	sanitary ww	outdoor	4/15/94	none	none	1975	Yes	scheduled for D&D
208	radioactive ww	indoor	4/18/94	NA	NA	1986	No	removed 1986
209	radioactive ww	indoor	4/18/94	NA	NA	1986	No	removed 1986
214	radioactive water	outdoor	4/15/94	none	none	1975	Yes	to be removed?
215	radioactive water	outdoor	4/15/94	none	none	1975	Yes	to be removed?
216	radioactive water	outdoor	4/19/94	none	none	1975	Yes	to be removed?
222	diesel	outdoor	4/21/94	NA	NA	12/18/1989	No	replaced 1990?
223	diesel	outdoor	4/21/94	NA	NA	12/18/1989	No	replaced 1990?
225	industrial ww	indoor	4/19/94	none	none	1984	No	to be removed?
226	radioactive water	indoor	4/20/94	NA	NA	--	No	--
227	radioactive water	--	4/14/94	NA	NA	1975	No	closure not complete
228	wastewater	indoor	4/14/94	NA	NA	1984	No	closure not complete
229	radioactive ww	indoor	4/14/94	NA	NA	1983	No	closure not complete
230	radioactive ww	indoor	4/14/94	NA	NA	1983	No	closure not complete
231	radioactive ww	indoor	4/14/94	NA	NA	1970-1975	No	closure not complete
232	radioactive ww	indoor	4/14/94	NA	NA	1970-1975	No	closure not complete
233	radioactive ww	indoor	4/14/94	NA	NA	1982	No	closure not complete
234	radioactive ww	indoor	4/14/94	NA	NA	1982	No	closure not complete
235	radioactive ww	indoor	4/14/94	NA	NA	1982	No	closure not complete
236	radioactive water	indoor	4/20/94	none	none	1975	No	Not in use

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ID	Building	Room/Location	Reference	OU-2 Category 1.)	Capacity (gallons)	Mound Program	Primary Regulatory Jurisdiction	Spill Jurisdiction	Tank Material	Status	Date Installed
237	HH	Rm HH-6	a,b	III	100	D&D	AEA	AEA	steel lined concrete	closed in place	1947
250	T	Rm T-44	b	III	100	D&D	AEA	AEA	steel lined concrete	closed in place	1947
251	T	Rm 16-B	b	--	350	D&D	AEA	AEA	steel lined concrete	closed in place	1947
255	R	Rm R-111	b	--	350	D&D	AEA	AEA	s/s lined concrete	inactive	1967
258	62	--	b	--	55	AUSTP	AEA	AEA	concrete	in service	1973
262	G	--	b	--	350	D&D	AEA	AEA	concrete	inactive	1947
266	R	Rm R-111	b	--	550	D&D	AEA	AEA	s/s lined concrete	inactive	1967
268	H	Breezway	b	--	55	AUSTP	CWA	AEA	steel lined concrete	in service	1947
269	T	Rm T-90	b	--	350	AUSTP	CWA	AEA	steel lined concrete	in service	1947
271	T	Rm T-1	b	--	350	AUSTP	AEA	AEA	concrete	in service	1947
272	T	Rm T-20	b	--	10,000	AUSTP	AEA	AEA	steel lined concrete	in service	1947
273	T	Rm T-37	b	--	200	AUSTP	AEA	AEA	steel lined concrete	in service	1947
280	P	NA	c	--	--	--	--	--	concrete	in service	--
281	A	Rm A-10	c	--	400	--	--	--	--	--	--
282	A	Rm A-10	c	--	400	--	--	--	--	--	--
283	A	Rm A-10	c	--	400	--	--	--	--	--	--
284	WD	Rm WD-12	c	--	--	--	--	--	Steel	--	--

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APPENDIX F
OU-2 SUMP AND TANK DATABASE
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ID	Purpose	Tank Cathodic Protection	Inlet of Tank	Outlet of Tank	Spills	Spill Overflow Protection	Piping Material
237	alpha ww sump	none	T Bldg. alpha ww from operations	WD Bldg.	No	NA	NA
250	ww sump	none	--	--	No	NA	NA
251	ww sump	none	--	--	No	NA	NA
255	calorimeter bath	none	none	none	No	none	none
258	hot waste sump	none	utility beneath Bldg. 62	storm water system	No	on/off level float switch	cast iron
262	waste oil storage	none	fill cap	6" funnel	--	NA	--
266	calorimeter bath	none	none	none	No	none	none
268	condensate sump	none	condensate in Bldg. H	storm water system	No	on/off float switch	--
269	condensate sump	none	condensate in Bldg. T	storm water system	No	on/off level float switch	bare steel
271	hot side fire water tanks	none	Tanks 272 and 273	rad to WD/non-rad to storm water system	No	manometer	--
272	fire water sump	none	sprinkler system	Tank 271	No	alarm with on/off float valve	cast iron
273	fire water sump	none	drain from lab 266	Tank 271	No	alarm with on/off	cast iron
280	Blow Down Sump for Compressors	--	--	--	--	--	--
281	--	--	--	--	--	--	--
282	--	--	--	--	--	--	--
283	--	--	--	--	--	--	--
284	--	--	--	--	--	--	--

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ER = Environmental Restoration
AUSTP = Active Underground Storage Tank Program

s/s = stainless steel
ww = wastewater
PVC = poly vinyl chloride
Bldg. = Building

File: APP-F.WK3-DATA-E
Project: 50942-002-00

APPENDIX F
OU-2 SUMP AND TANK DATABASE
Page 9 of 9

ID	Substance Last or Currently Stored	Tank Site Description	Date Inspected	Tank Release Detection Method	Piping Release Detectio	Closure Date	Map Available	Notes
237	radioactive water	indoor	4/19/94	NA	NA	1961	No	filled with concrete
250	'ww	indoor	4/14/94	NA	NA	1984	No	filled with concrete
251	ww	indoor	4/14/94	NA	NA	1984	No	filled with concrete
255	deionized water	indoor	4/19/94	none	none	--	No	--
258	radioactive ww	indoor	4/19/94	none	none	NA	Yes	--
262	used oil	NA	4/19/94	NA	NA	--	No	no paper work
266	deionized water	indoor	4/19/94	none	none	--	No	--
268	condensate ww	indoor	4/21/94	none	none	NA	No	--
269	condensate ww	indoor	4/14/94	none	none	NA	No	--
271	potential rad. water	indoor	4/14/94	none	none	NA	No	--
272	potential rad. water	indoor	4/14/94	none	none	NA	No	--
273	potential rad. water	indoor	4/14/94	none	none	NA	No	--
280	--	outdoor	8/25/94	--	--	NA	Yes	--
281	--	indoor	6/05/94	--	--	--	Yes	--
282	--	indoor	6/05/94	--	--	--	Yes	--
283	--	indoor	6/05/94	--	--	--	Yes	--
284	--	indoor	6/15/94	--	--	--	--	--

REFERENCES:

a) DOE, 1992. "Mound Plant Underground Storage Tank Program Plan and Regulatory Status Review"
b) EG&G, 1994. " Active Underground Storage Tank Plan", May 16, 1994 (Dames & Moore)
c) ICF KE field investigation

LEGEND:

NA = Not Applicable
-- = Information not available
AEA = Atomic Energy Act
CWA = Clean Water Act
BUSTR = Bureau of Underground Storage Tanks Regulations
FFA = Federal Facility Agreement
D&D = Decontamination and Decommissioning
ER = Environmental Restoration
AUSTP = Active Underground Storage Tank Program

s/s = stainless steel
ww = wastewater
PVC = poly vinyl chloride
Bldg. = Building

File: APP-F.WK3-DATA-E
Project: 50942-002-00

APPENDIX G

APPENDIX G

OU-2 RI PHASE I
UNDOCUMENTED SUMP AND TANK LOCATIONS

Figure G.1.	Un-Documented P Building Sumps and Tanks	Page G.2.
Figure G.2.	Un-Documented A Building Sumps	Page G.3.
Figure G.3.	Un-Documented R Building Sumps	Page G.4.
Figure G.4.	Un-Documented C Building Sump	Page G.5.
Figure G.5.	Un-Documented SW Building Sumps	Page G.6.

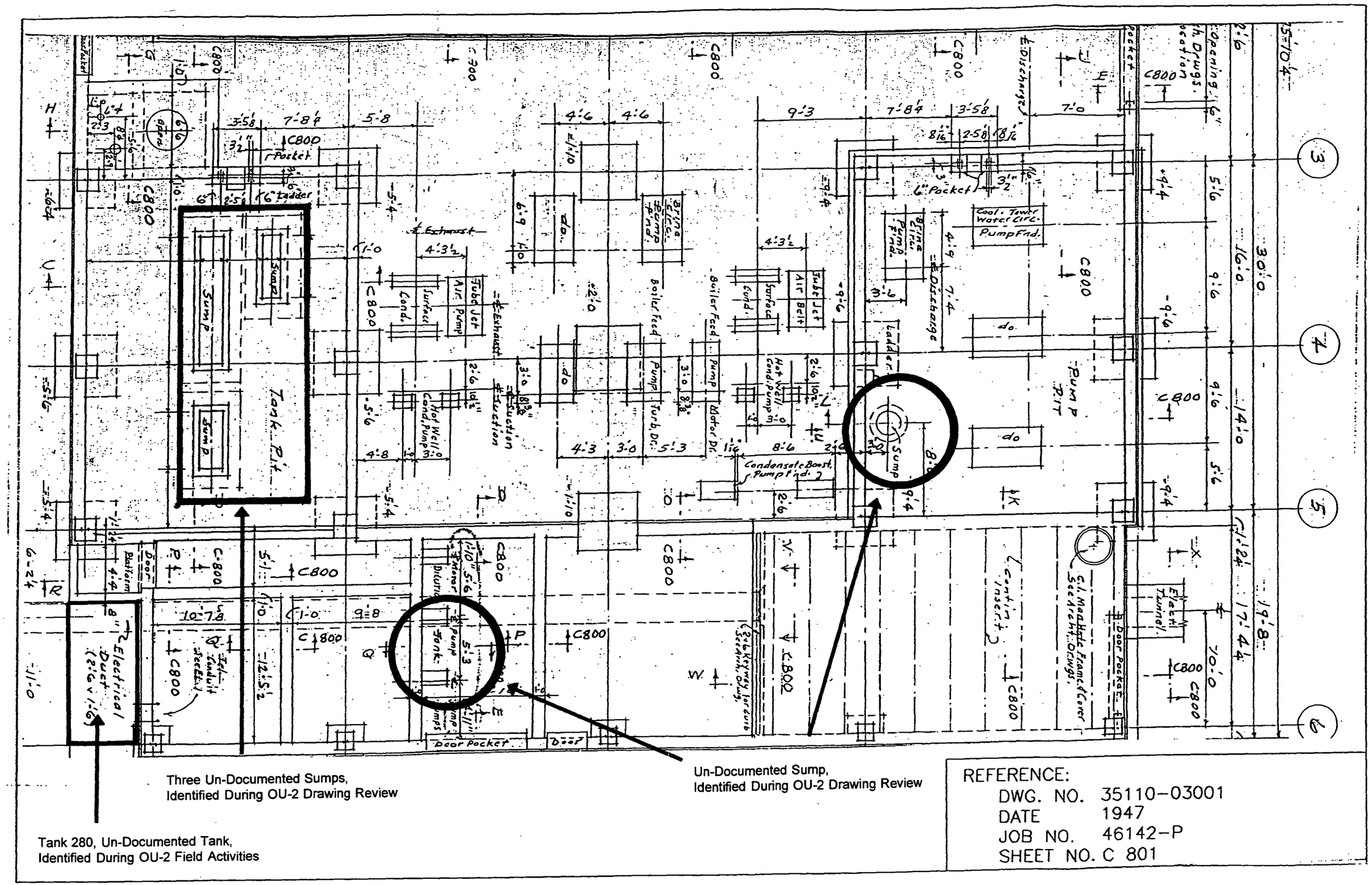


Figure G.1. Un-Documented P Building Sumps and Tanks

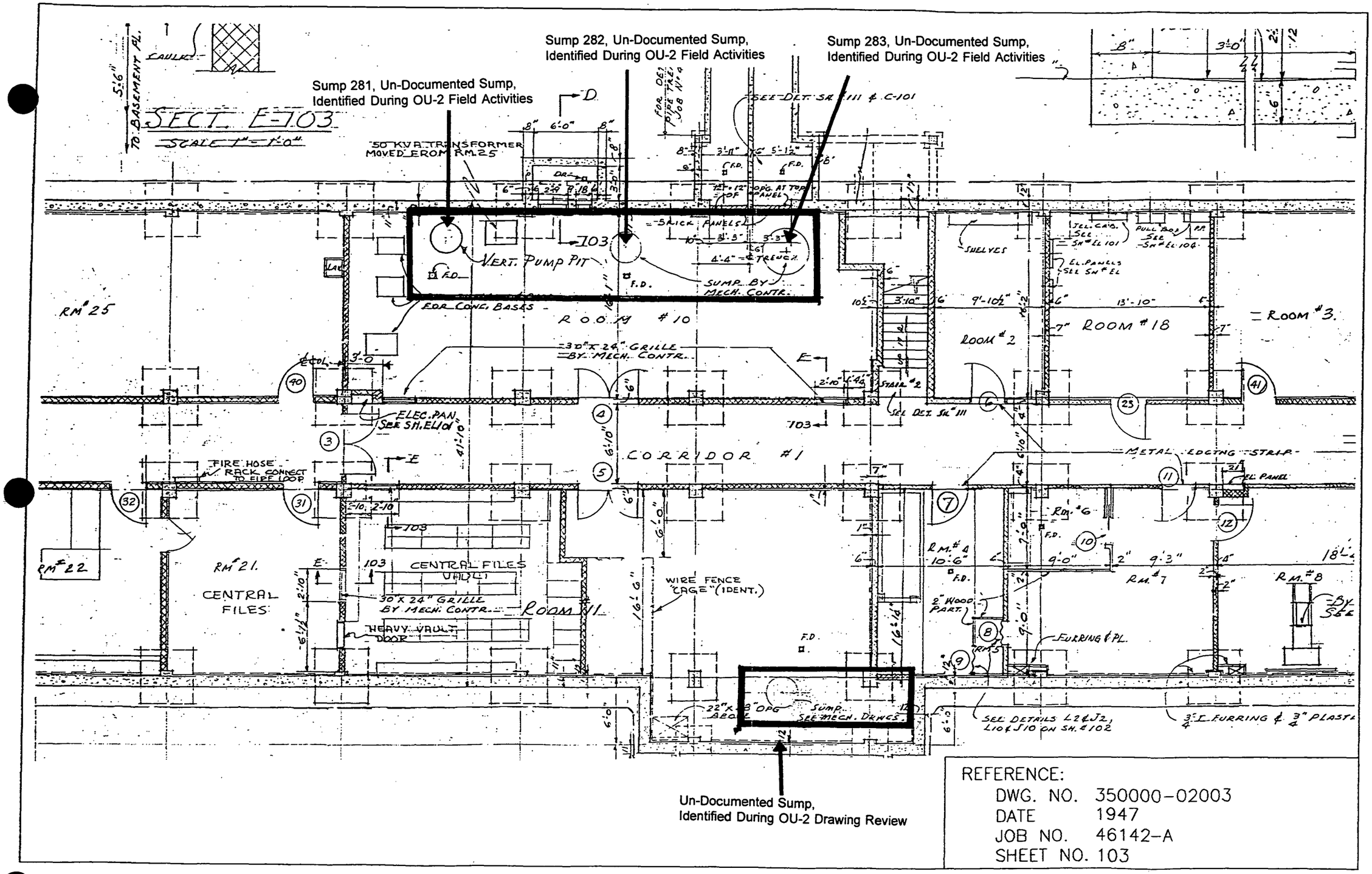
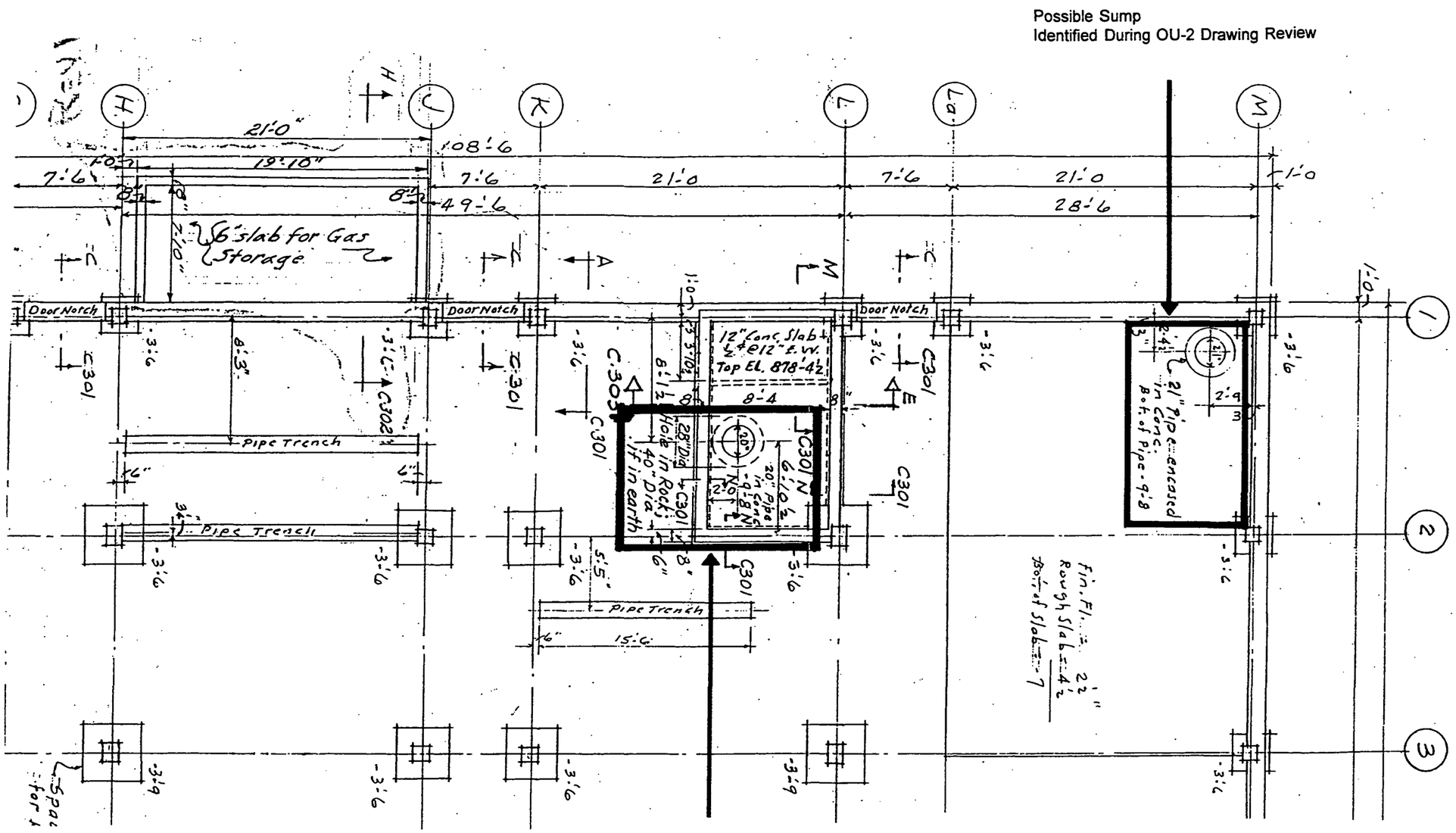
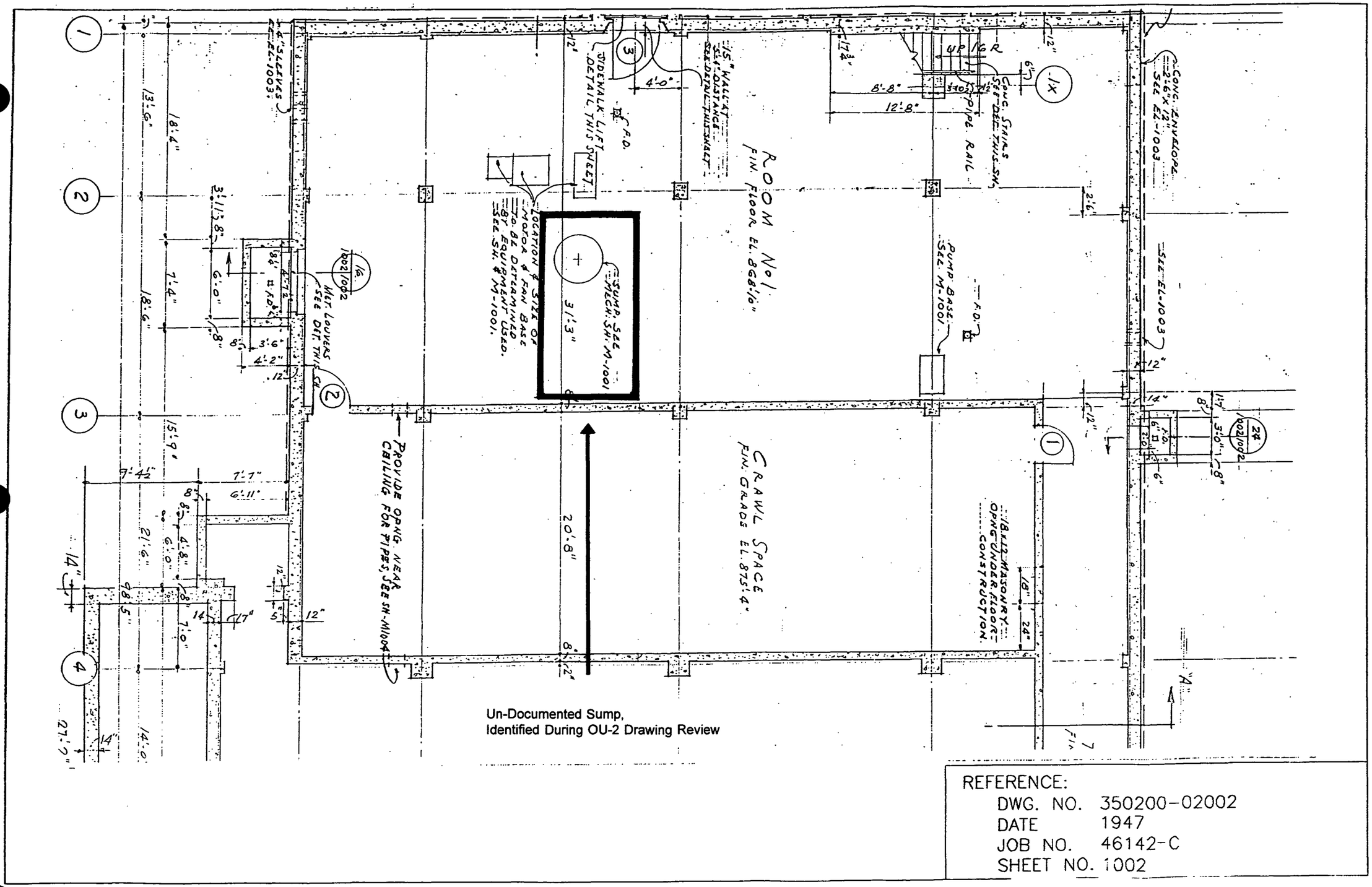


Figure G.2. Un-Documented A Building Sumps



REFERENCE:
DWG. NO. 351300-03001
DATE 1947
JOB NO. 46142-R
SHEET NO. C 103

Figure G.3. Un-Documented R Building Sumps



Un-Documented Sump,
Identified During OU-2 Drawing Review

REFERENCE:
DWG. NO. 350200-02002
DATE 1947
JOB NO. 46142-C
SHEET NO. 1002

Figure G.4. Un-Documented C Building Sump

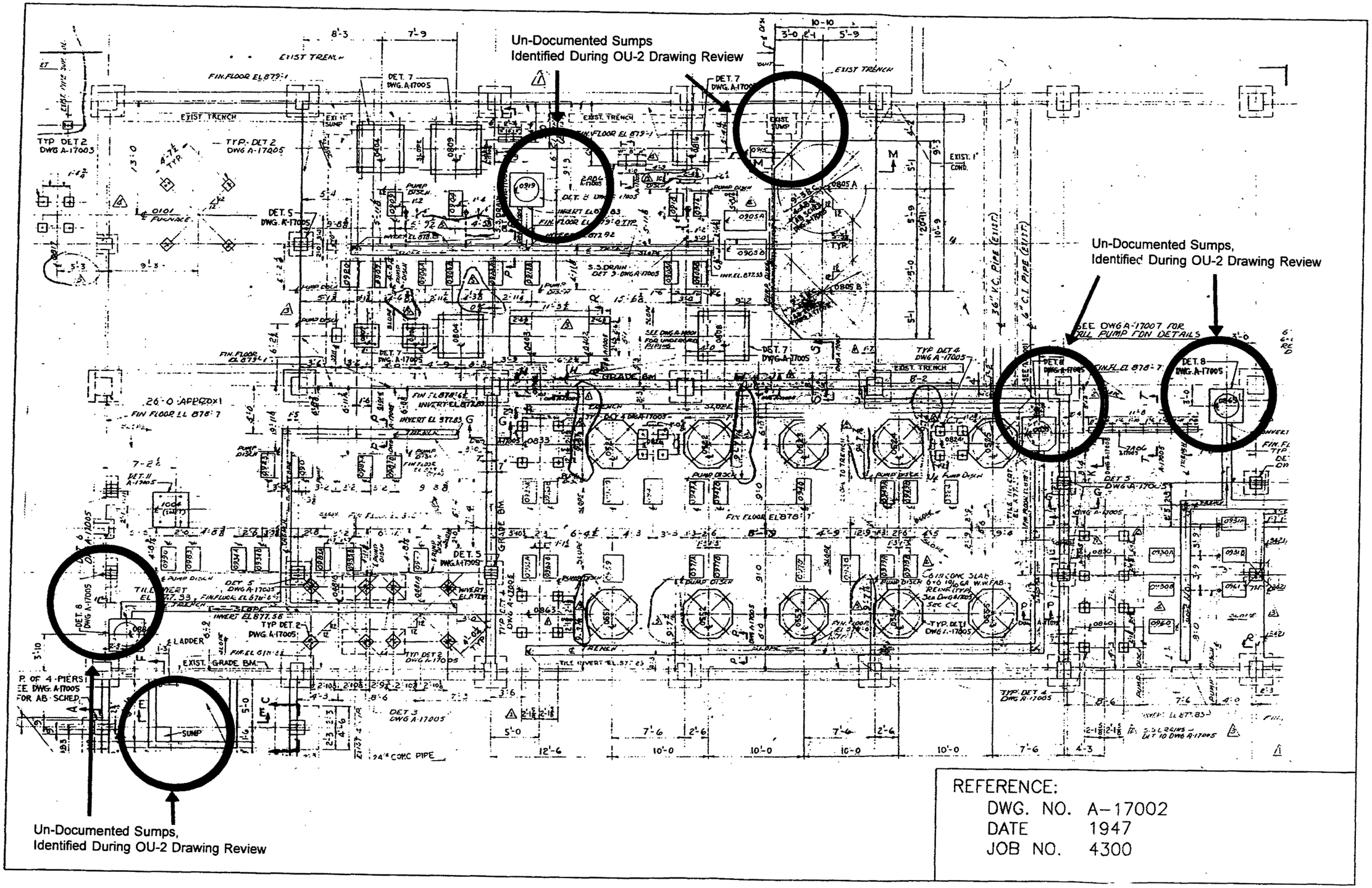
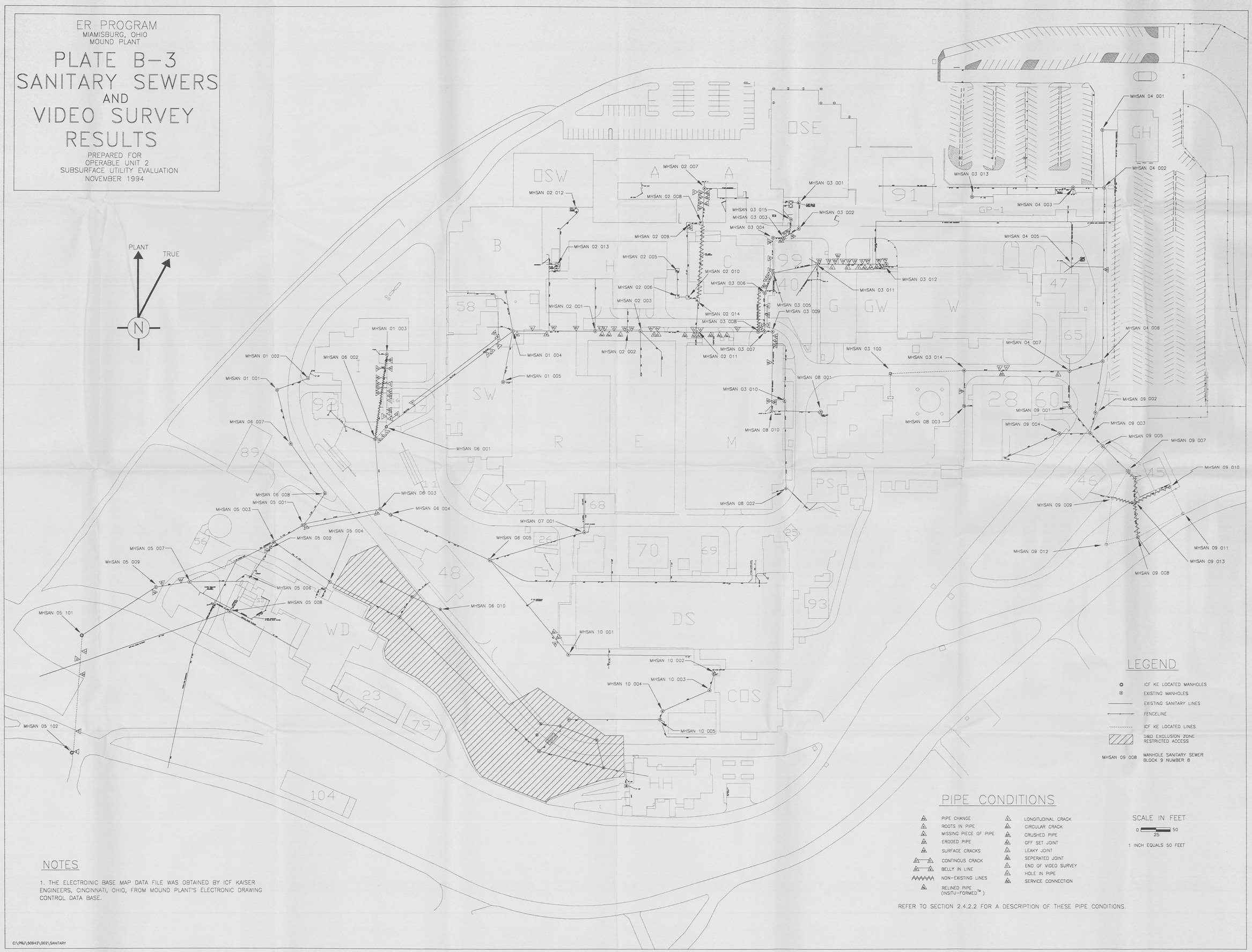


Figure G.5. Un-Documented SW Building Sumps

ER PROGRAM
MIAMISBURG, OHIO
MOUND PLANT

PLATE B-3
SANITARY SEWERS
AND
VIDEO SURVEY
RESULTS

PREPARED FOR
OPERABLE UNIT 2
SUBSURFACE UTILITY EVALUATION
NOVEMBER 1994



LEGEND

- ICF KE LOCATED MANHOLES
- EXISTING MANHOLES
- EXISTING SANITARY LINES
- FENCELINE
- ICF KE LOCATED LINES
- DOD EXCLUSION ZONE RESTRICTED ACCESS
- MHSAN 09 008 — MANHOLE SANITARY SEWER BLOCK 9 NUMBER 8

PIPE CONDITIONS

- PIPE CHANGE
- ROOTS IN PIPE
- MISSING PIECE OF PIPE
- ERODED PIPE
- SURFACE CRACKS
- CONTINOUS CRACK
- BELLY IN LINE
- NON-EXISTING LINES
- RELINED PIPE (INSITU-FORMED™)
- LONGITUDINAL CRACK
- CIRCULAR CRACK
- CRUSHED PIPE
- OFF SET JOINT
- LEAKY JOINT
- SEPERATED JOINT
- END OF VIDEO SURVEY
- HOLE IN PIPE
- SERVICE CONNECTION

REFER TO SECTION 2.4.2.2 FOR A DESCRIPTION OF THESE PIPE CONDITIONS.

SCALE IN FEET

0 — 25 — 50

1 INCH EQUALS 50 FEET

NOTES

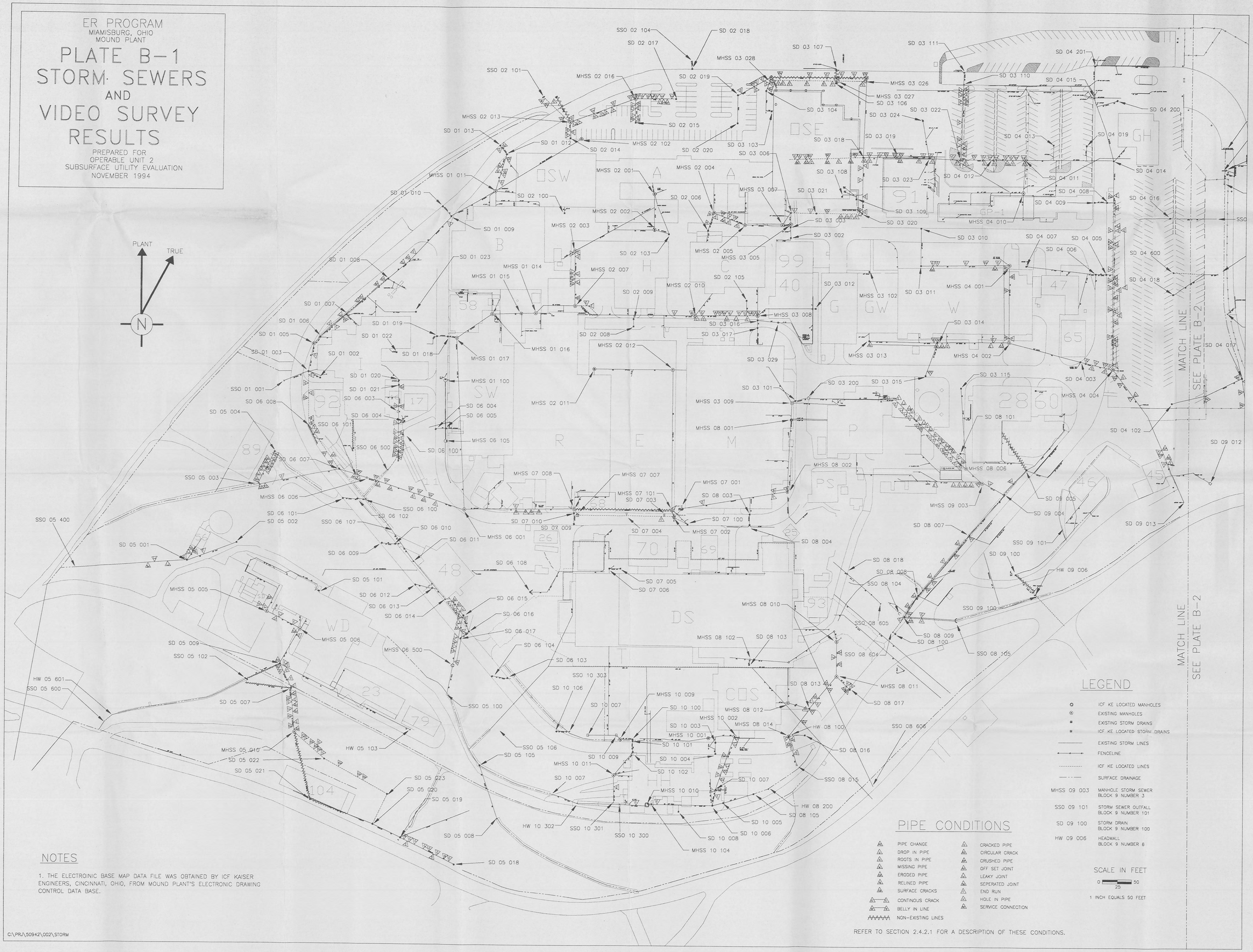
1. THE ELECTROINIC BASE MAP DATA FILE WAS OBTAINED BY ICF KAISER ENGINEERS, CINCINNATI, OHIO, FROM MOUND PLANT'S ELECTRONIC DRAWING CONTROL DATA BASE.

C:\PRJ\50842\002\SANITARY

ER PROGRAM
MIAMISBURG, OHIO
MOUND PLANT

PLATE B-1
STORM SEWERS AND VIDEO SURVEY RESULTS

PREPARED FOR
OPERABLE UNIT 2
SUBSURFACE UTILITY EVALUATION
NOVEMBER 1994



NOTES

1. THE ELECTROINIC BASE MAP DATA FILE WAS OBTAINED BY ICF KAISER ENGINEERS, CINCINNATI, OHIO, FROM MOUND PLANT'S ELECTRONIC DRAWING CONTROL DATA BASE.

PIPE CONDITIONS

- PIPE CHANGE
- DROP IN PIPE
- ROOTS IN PIPE
- MISSING PIPE
- ERODED PIPE
- RELINED PIPE
- SURFACE CRACKS
- CONTINOUS CRACK
- BELLY IN LINE
- NON-EXISTING LINES
- CRACKED PIPE
- CIRCULAR CRACK
- CRUSHED PIPE
- OFF SET JOINT
- LEAKY JOINT
- SEPERATED JOINT
- END RUN
- HOLE IN PIPE
- SERVICE CONNECTION

REFER TO SECTION 2.4.2.1 FOR A DESCRIPTION OF THESE CONDITIONS.

LEGEND

- ICF KE LOCATED MANHOLES
- EXISTING MANHOLES
- EXISTING STORM DRAINS
- ICF KE LOCATED STORM DRAINS
- EXISTING STORM LINES
- FENCELINE
- ICF KE LOCATED LINES
- SURFACE DRAINAGE
- MHSS 09 003 — MANHOLE STORM SEWER BLOCK 9 NUMBER 3
- SSO 09 101 — STORM SEWER OUTFALL BLOCK 9 NUMBER 101
- SD 09 100 — STORM DRAIN BLOCK 9 NUMBER 100
- HW 09 006 — HEADWALL BLOCK 9 NUMBER 6

SCALE IN FEET

0 — 25 — 50

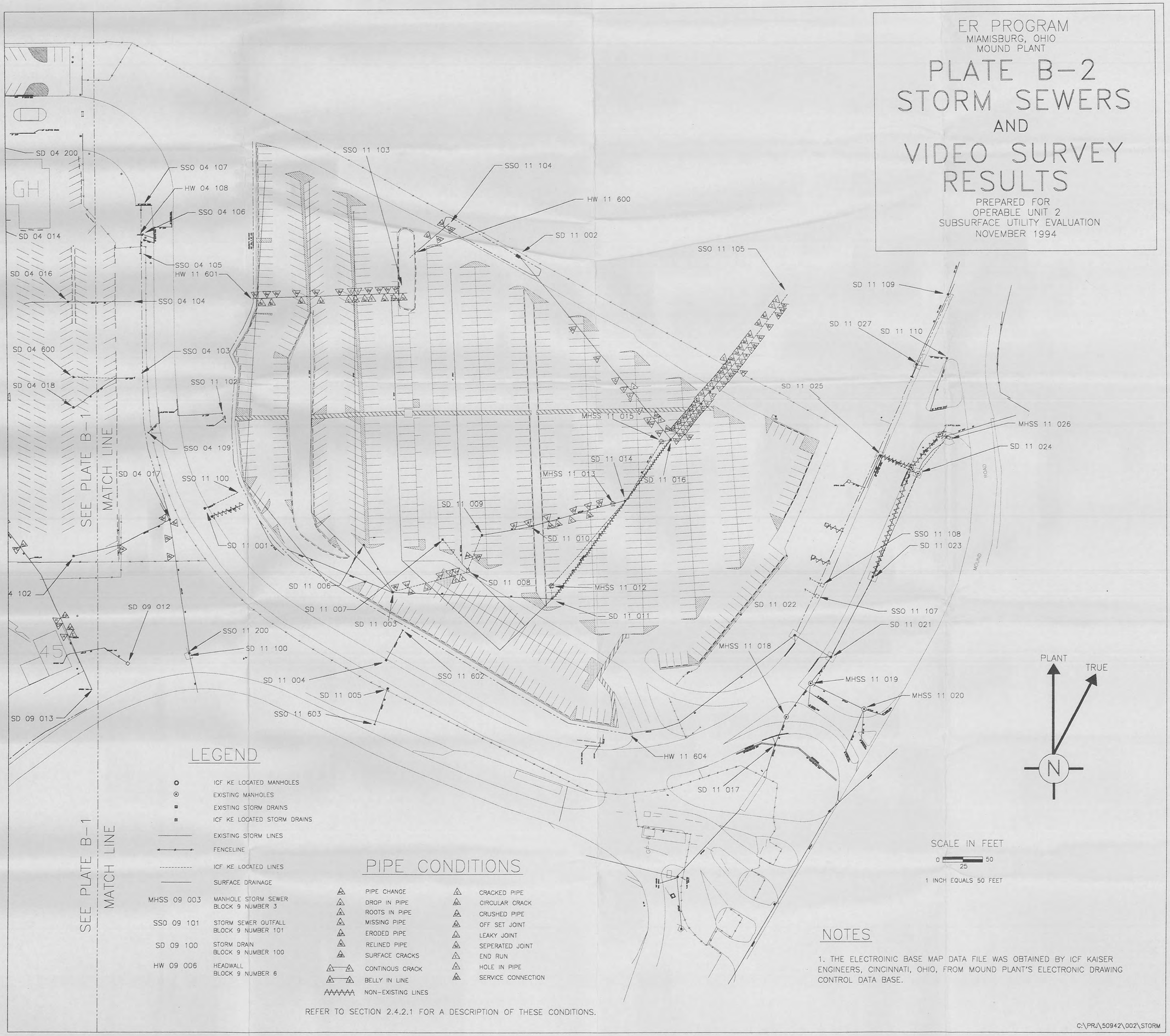
1 INCH EQUALS 50 FEET

C:\PRJ\50942\002\STORM

ER PROGRAM
MIAMISBURG, OHIO
MOUND PLANT

PLATE B-2
STORM SEWERS
AND
VIDEO SURVEY RESULTS

PREPARED FOR
OPERABLE UNIT 2
SUBSURFACE UTILITY EVALUATION
NOVEMBER 1994



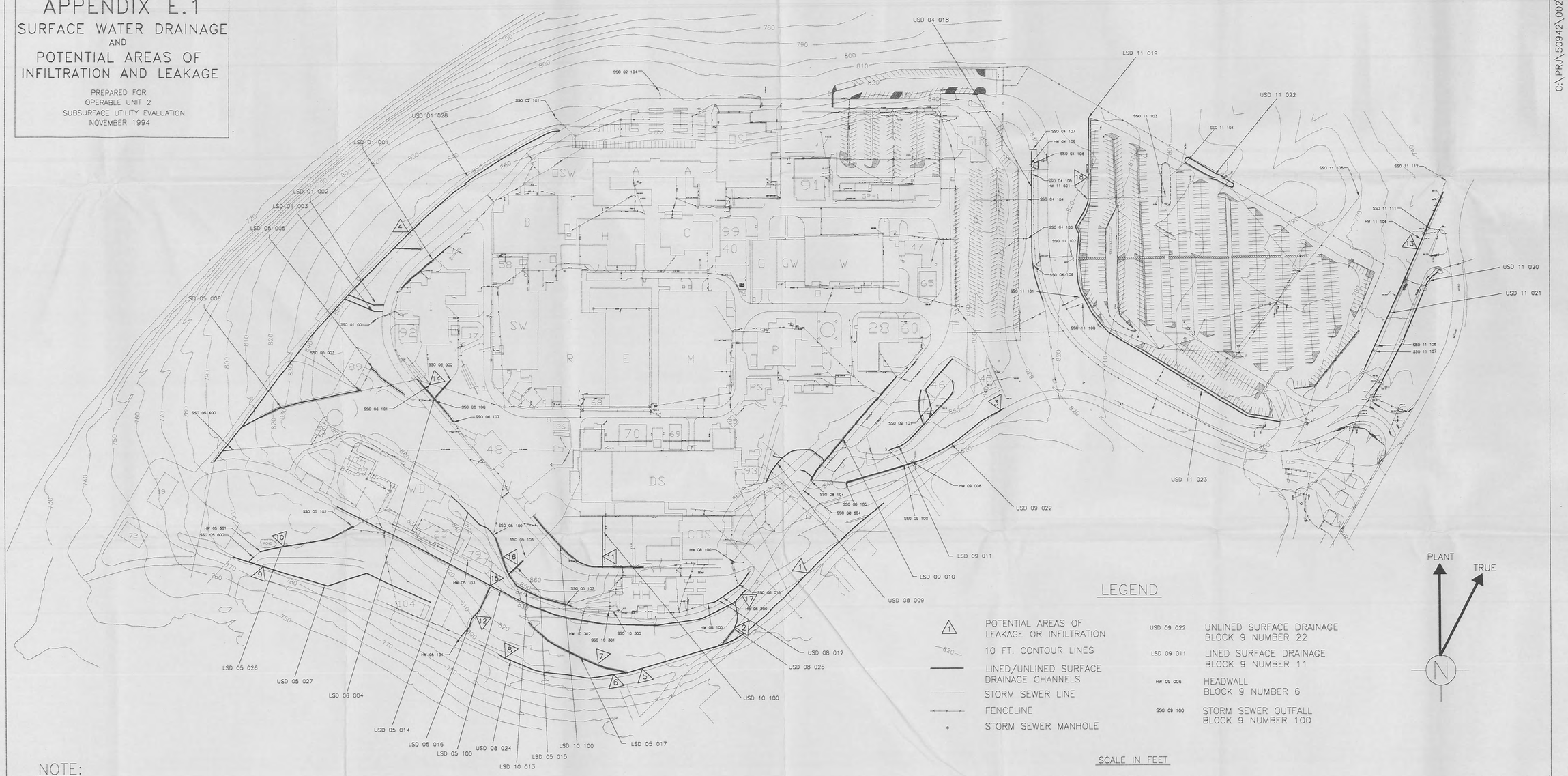
ER PROGRAM
MIAMISBURG, OHIO
MOUND PLANT

APPENDIX E.1

SURFACE WATER DRAINAGE AND POTENTIAL AREAS OF INFILTRATION AND LEAKAGE

PREPARED FOR
OPERABLE UNIT 2
SUBSURFACE UTILITY EVALUATION
NOVEMBER 1994

C:\ PRJ\ 50942\ 002\ BASE1-90



LEGEND

1	POTENTIAL AREAS OF LEAKAGE OR INFILTRATION	USD 09 022	UNLINED SURFACE DRAINAGE BLOCK 9 NUMBER 22
820	10 FT. CONTOUR LINES	LSD 09 011	LINED SURFACE DRAINAGE BLOCK 9 NUMBER 11
	LINED/UNLINED SURFACE DRAINAGE CHANNELS	HW 09 006	HEADWALL BLOCK 9 NUMBER 6
	STORM SEWER LINE	SSO 09 100	STORM SEWER OUTFALL BLOCK 9 NUMBER 100
	FENCELINE		
	STORM SEWER MANHOLE		

SCALE IN FEET

0 125 250

NOTE:

1. THE ELECTROINIC BASE MAP DATA FILE WAS OBTAINED BY ICF KAISER ENGINEERS, CINCINNATI, OHIO, FROM MOUND PLANT'S ELECTRONIC DRAWING CONTROL DATA BASE.