112461

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
ENVIRONMENTAL PHOTOGRAPHIC INTERPRETATION CENTER
VINT HILL FARM STATION
P.O. 1587, WARRENTON, VIRGINIA 22186

October 25, 1985

SUBJECT: Site Analysis Keystone Sanitation Landfill,
Adams County, Pennsylvania - Report

FROM: Richard G. Park
Region 3 Desk Officer
Environmental Photographic Interpretation Center
Advanced Monitoring Systems Division

TO: Timothy Travers (3HW12)
CERCLA Remedial Enforcement Section
EPA, Region 3

Enclosed please find two copies of subject report.

If you have any questions or if we can be of further assistance, please give me a call on FTS 557-3110.

Attachments

AR500190

United States
Environmental Protection
Agency

Environmental Monitoring
Systems Laboratory
P.O. Box 15027
Las Vegas NV 89114

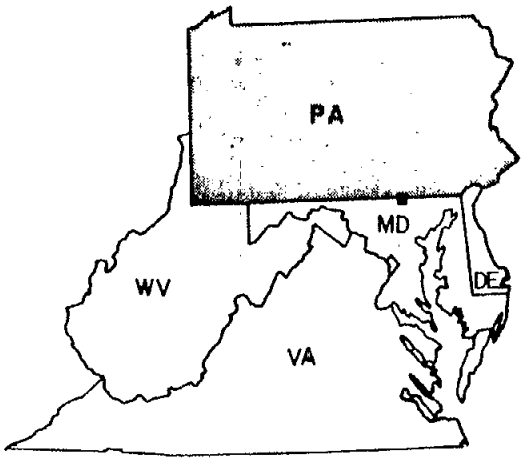
TS-PIC-85133
October 1985

Research and Development

EPA

Site Analysis
Keystone Sanitation Landfill
Adams County, Pennsylvania

EPA Region 3
and OERR



TS-PIC-85133
October 1985

Site Analysis
Keystone Sanitation Landfill
Adams County, Pennsylvania

by
L. Mike Fauss, Imagery Analyst
The Bionetics Corporation
Warrenton, Virginia 22186

Contract No. 68-03-3101

Project Officer
Richard G. Park
Environmental Photographic Interpretation Center
Environmental Monitoring Systems Laboratory
Warrenton, Virginia 22186, FTS 557-3110

ENVIRONMENTAL MONITORING SYSTEMS LABORATORY
OFFICE OF RESEARCH AND DEVELOPMENT
U.S. ENVIRONMENTAL PROTECTION AGENCY
LAS VEGAS, NEVADA 89114

NOTICE

This document has not been peer and administratively reviewed within EPA and is for internal Agency use and distribution only.

AR500193

ABSTRACT

This report presents an analysis of historical aerial photography and a fracture trace/lineament analysis of the Keystone Sanitation Landfill, located in Adams County, Pennsylvania. The objective of this report was to document the waste disposal activities at the landfill, with special attention directed towards identification of possible liquid waste disposal activity.

Landfilling activities were first noted in 1971 when a fill area, trench, working face and dark-toned material were seen. The fill area continued to expand throughout the analysis. The first evidence of possible liquid waste disposal was seen in 1984 when ground stains, showing forms indicative of liquid flow, were detected. These ground stains were seen in a trench located on the fill area, and also in the central compound.

A land use and drainage analysis was performed for the year 1984.

The fracture trace/lineament analysis, keyed to a 1981 photograph, revealed eleven fracture trace/lineament elements in the vicinity of the site.

The Environmental Protection Agency's (EPA) Environmental Photographic Interpretation Center in Warrenton, Virginia, a field station of the Environmental Monitoring Systems Laboratory in Las Vegas, Nevada, performed this study at the request of EPA Region 3. This analysis covers the period from 1964 to 1984, and the report was completed in October 1985.

CONTENTS

FIGURES

AR500195

INTRODUCTION

The following report presents an analysis of historical aerial photography and a fracture trace/lineament analysis of the Keystone Sanitation Landfill, located in Adams County, Pennsylvania. Figure 1 depicts the site location, keyed to a U.S. Geological Survey (USGS) 1:24,000 scale topographic map. Site boundaries or areas used in the analysis were determined by observations made from the aerial photography and do not denote legal property lines or ownership.

The objective of this analysis is to document waste disposal practices at the landfill. Special attention was directed towards the identification of possible liquid waste disposal areas. Each year of imagery was examined for type and appearance of fill material, leachate, equipment in use, onsite buildings and sheds, evidence of liquid disposal, vegetation stress/damage, obstacles to ground inspection parties and other significant features. No leachate, vegetation stress/damage or obstacles to ground inspection parties were detected in this analysis.

Aerial photography of the Keystone Sanitation Landfill was obtained to represent the period from 1964 to 1984.[1] Historical black and white photography for the years 1964, 1971 and 1981, and color infrared photography for 1984 were used for this analysis.

A land use and drainage analysis was performed for the year 1984.

A fracture trace/lineament analysis, keyed to the 1981 photography, revealed eleven fracture trace/lineament elements in the vicinity of the site.

The Environmental Protection Agency's (EPA) Environmental Photographic Interpretation Center in Warrenton, Virginia, a field station for the Environmental Monitoring Systems Laboratory in Las Vegas, Nevada, performed this study at the request of EPA Region 3. This analysis was completed in October 1985.

[1] A complete listing of all maps and photography used for this report can be found in the References section.

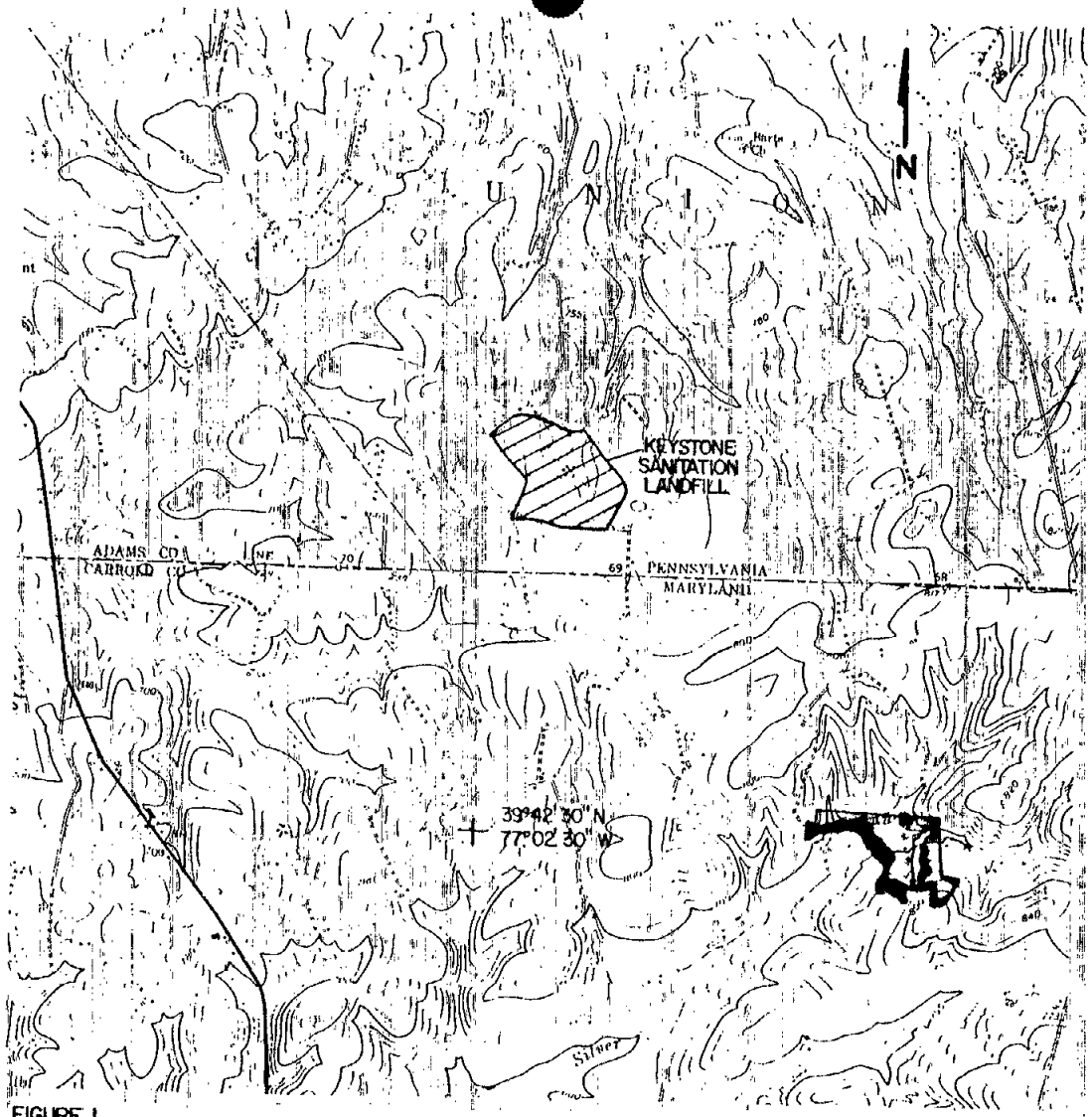


FIGURE 1
KEYSTONE SANITATION LANDFILL

LOCATION MAP
LITTLESTOWN, MD.-PA. QUAD

SCALE 1:24,000

AR500197

METHODOLOGY

A search of government and commercial aerial photographic sources was undertaken to obtain the best quality photography available of the site spanning the desired time frame. A listing of all maps and photography used for this report can be found in the References section.

The analysis was performed by stereoscopically viewing pairs of transparencies, backlit on a standard Richards light table. By observing the site three-dimensionally, and at various magnifications, the analyst could search for objects, features, or "signatures" associated with different environmental conditions. The term "signature" refers to a combination of characteristics (such as color, tone, shadow, texture and size) which indicate a specific object or condition, even though the object itself is not identifiable from the photography.

Prints were made from coverages which reveal significant changes in the study area. Findings are annotated on overlays to these prints, or to maps of the study area, and full descriptions are provided in the accompanying text. The resolution quality of the original, transparent photography used by the analyst is degraded on the prints due to factors inherent in the printing process. Therefore, some objects or features identified from the original film and described in the text may not be clearly discernible, or even visible, on the photographic prints presented in this report.

Fracture traces/lineaments are defined in this report as linear geologic features that can be identified on aerial photography as one or more of the following features: differences in vegetation growth or lushness; soil tonal variations; discontinuities in rock outcrops; and topographic features like straight stream segments and shallow grooves in the land surface. Care has been taken to exclude other linear geologic features such as stratigraphic contacts, unconformities and linear igneous intrusives such as dikes.

It should be noted that site boundaries or areas used in this analysis were determined by observations made from the aerial photography and do not denote legal property lines or ownership.

In this report, a distinction is made between probable and possible identifications. Probable is used when a limited number of discernible signatures allows the analyst to be reasonably sure of a particular identification. Possible is used when few signatures are discernible, and the analyst can only infer an identification.

LAND USE AND DRAINAGE

Figure 2 depicts the various types of land uses within an approximate 2-kilometer (1.2-mile) radius of the Keystone Sanitation Landfill. The land use classification system used in this report was adapted from a United States Department of the Interior publication[1] on land use identification using remote sensor data. Minor modifications to this system were required to provide an accurate representation of land usage in the area.

The area surrounding the Keystone Sanitation Landfill is primarily composed of cropland and pasture with minor amounts of woodland areas.

The nearest dwelling is located approximately 35 meters (113 feet) from the northern site boundary. The nearest offsite surface water is a farm pond located approximately 518 meters (1,706 feet) south of the southern site boundary.

Drainage from the site is received by two unnamed streams; one flows north while the second one flows west. The westward-flowing stream is part of the headwaters for Piney Creek. A detailed analysis of the site's drainage is included on all years of imagery (Figures 3-6) and will not be mentioned again unless significant change is noted.

The following categories are used in this analysis:

LAND USE CATEGORIES

11 - Residential
15 - Utilities
170 - Landfill
21 - Cropland and Pasture
24 - Farmsteads
32 - Shrub-Brush Rangeland
41 - Deciduous Forest
52 - Natural Lakes and Ponds
53 - Man-Made Reservoirs and Impoundments

[1] Anderson, James R. et al., 1976, A Land Use and Land Cover Classification System for Use with Remote Sensor Data, U.S. Department of the Interior, Geological Survey Professional Paper 964.

AR500198

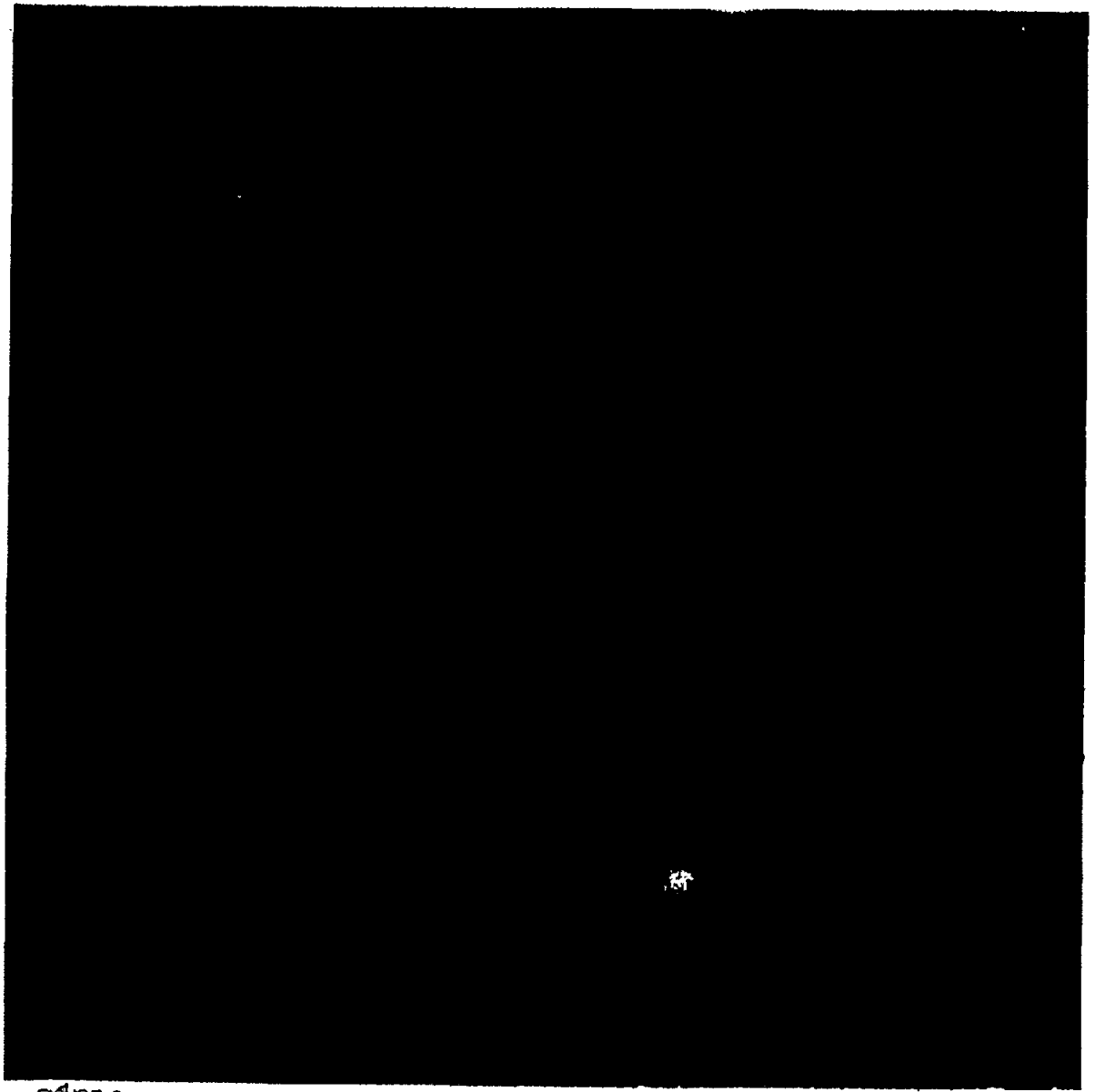


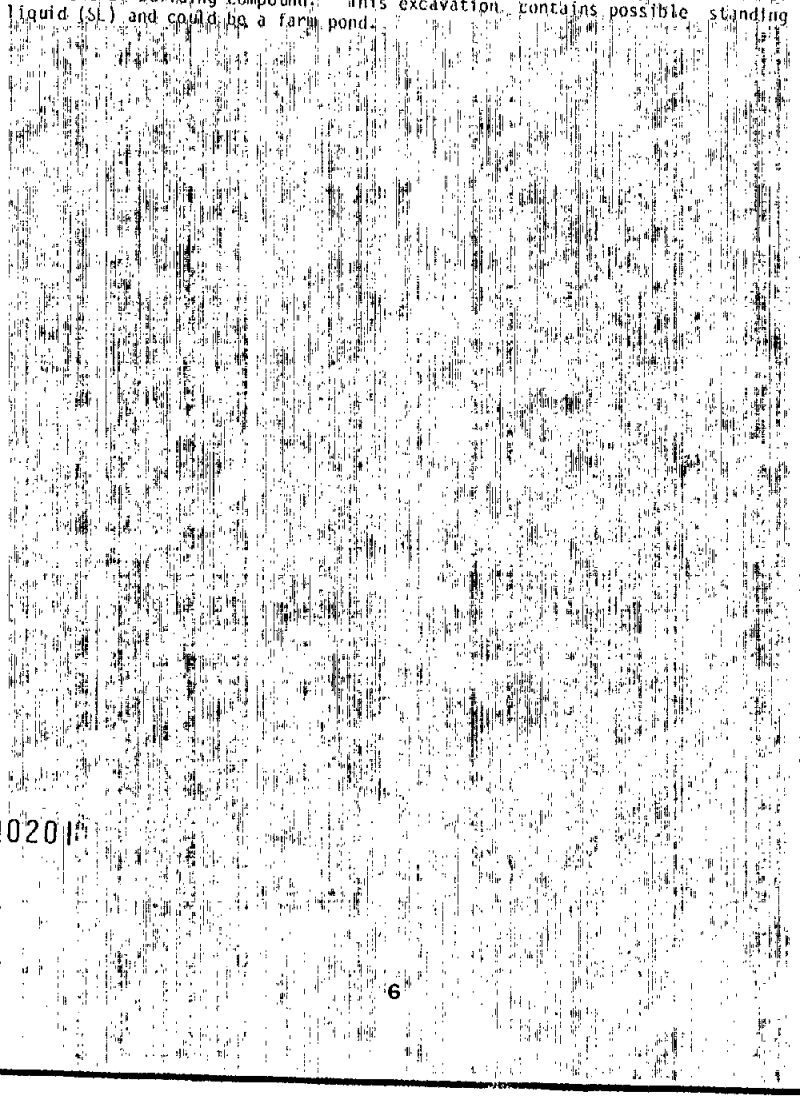
FIGURE 2
KEYSTONE SANITATION LANDFILL

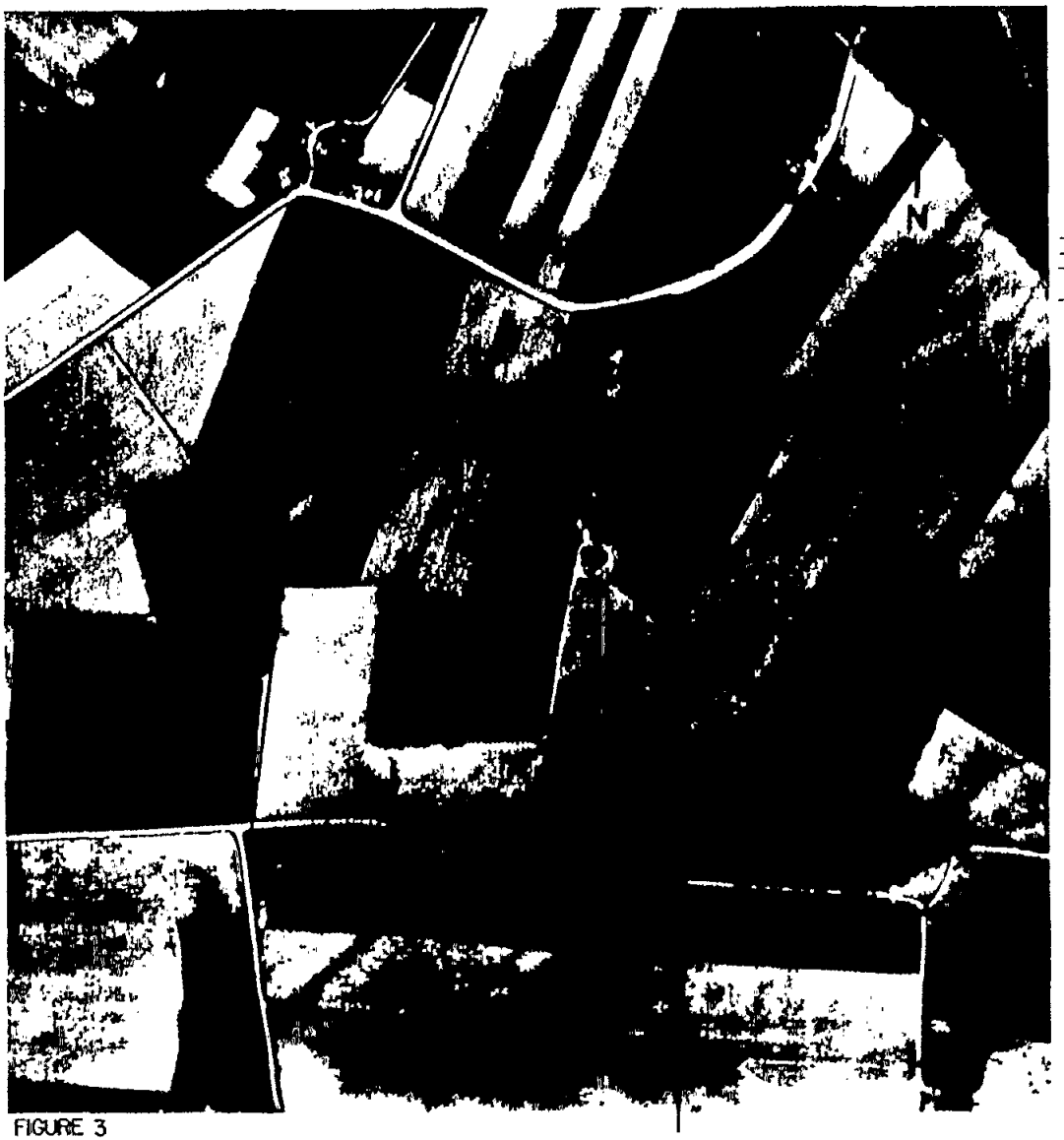
LAND USE/DRAINAGE
JULY 12,1984

APPROX SCALE 1:3,600

JUNE 11, 1964 (Figure 3)

No landfilling activities are seen at this time. The site is composed of four buildings (B) and four sheds. Access to the central building compound extends south from the northern boundary road. Although no landfilling activities can be seen at this time, a shallow excavation is visible north of the central building compound. This excavation contains possible standing liquid (SL) and could be a farm pond.





AR500202

FIGURE 3
KEYSTONE SANITATION LANDFILL JUNE 11,1964 APPROX SCALE 1:3,800

AUGUST 13, 1971 (Figure 4)

Landfilling activities can be seen in the southern section of the site at this time. All four sheds and Building 2 have been removed from the central section of the site. An apparent maintenance shed (Building 5) has replaced Building 2. Possible equipment (E) is seen on the north side of Building 5. Building 3, located in the south central portion of the compound, has been expanded.

The access road that leads into the central compound from the north has been altered. Two access roads extend from the central compound to the fill area (FA) located in the southern section of the site. Active landfilling is apparently ongoing in the northeast corner of the fill area where a trench, probable working face (WF), and dark-toned (DM) material (M) are seen. A vehicle (V) is visible on the central portion of the fill area. The drainage has been ditched to flow southward along the western edge of the fill area.

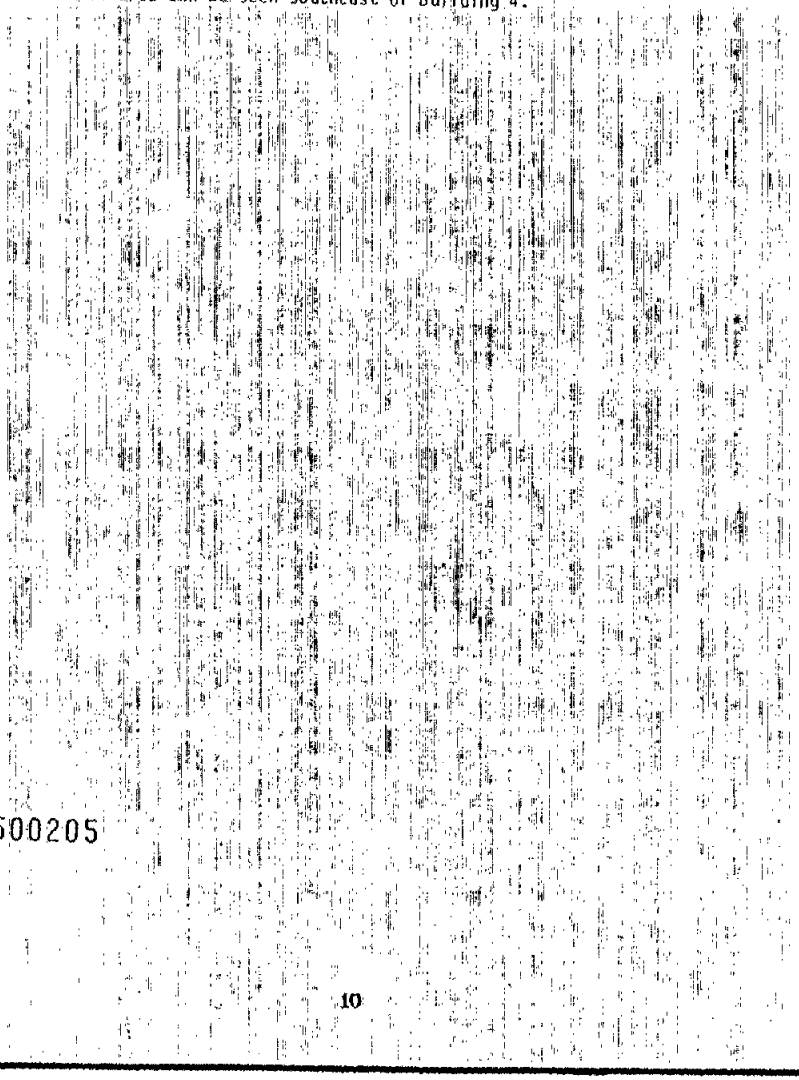
AR500204

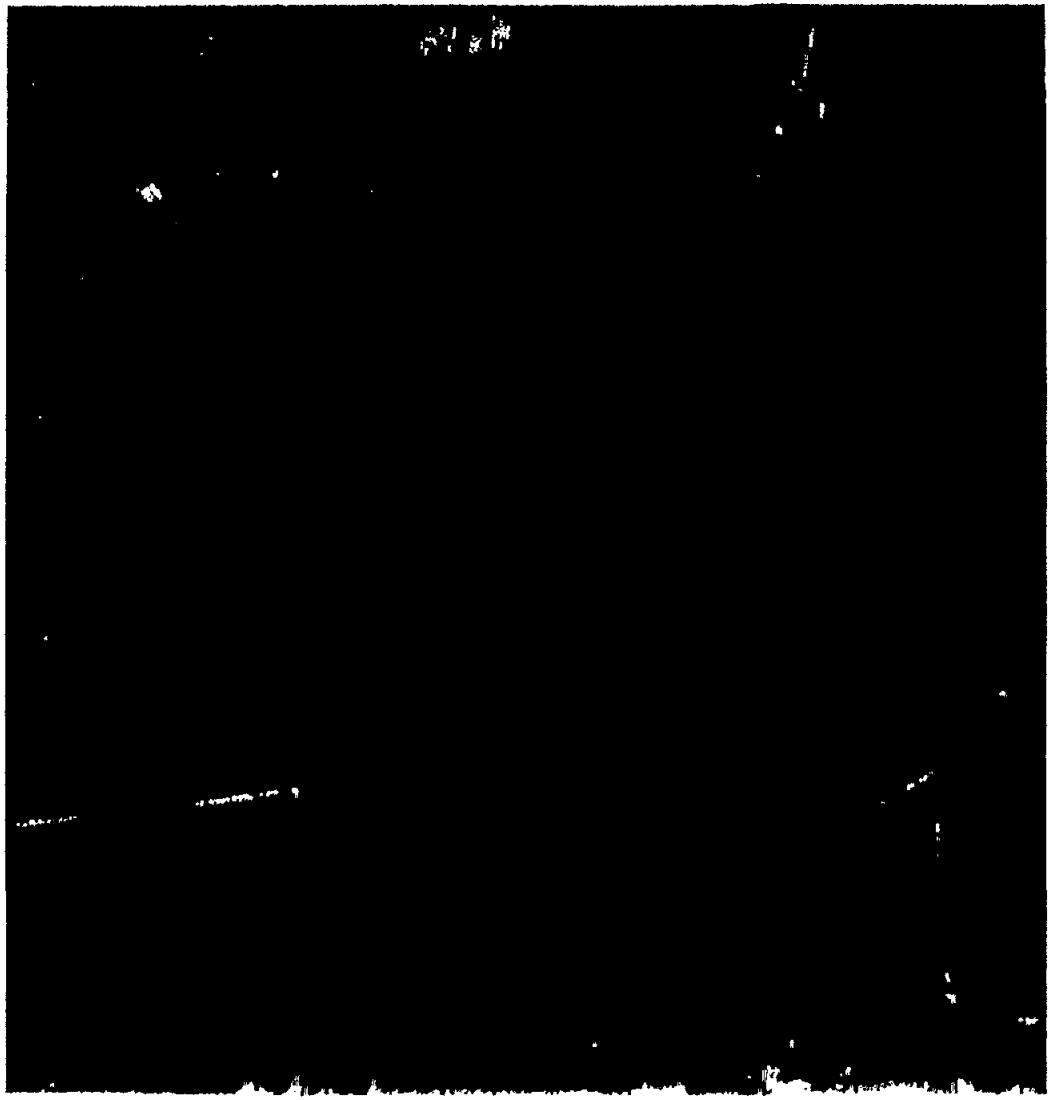
FIGURE 4
KEYSTONE SANITATION LANDFILL AUGUST 13, 1971 APPROX SCALE 1" 3,800

APRIL 2, 1981 (Figure 5)

The fill area and a probable fill area incorporate most of the southern section of the site. The fill area in the southern section of the site has covered the drainage seen in 1971. Possible equipment is visible in the southeastern corner of the site.

Building 1 in the central compound has been expanded. Probable equipment and vehicles are located along the eastern edge of the central compound. A dark-toned area can be seen southeast of Building 4.





LEGEND

B - Building
DX - "Dark-Toned"
E - Equipment
FA - Fill Area
GST - Ground Stain
LT - Light-Toned
M - Material
SL - Standing Liquid
V - Vehicle
WF - Working Face
Access Road
Ditched Drainage
Drainage
Edge of Fill
Site Boundary

AR500206

FIGURE 5
KEYSTONE SANITATION LANDFILL APRIL 2, 1981 APPROX SCALE 1:4,600

JULY 12, 1984 (Fig

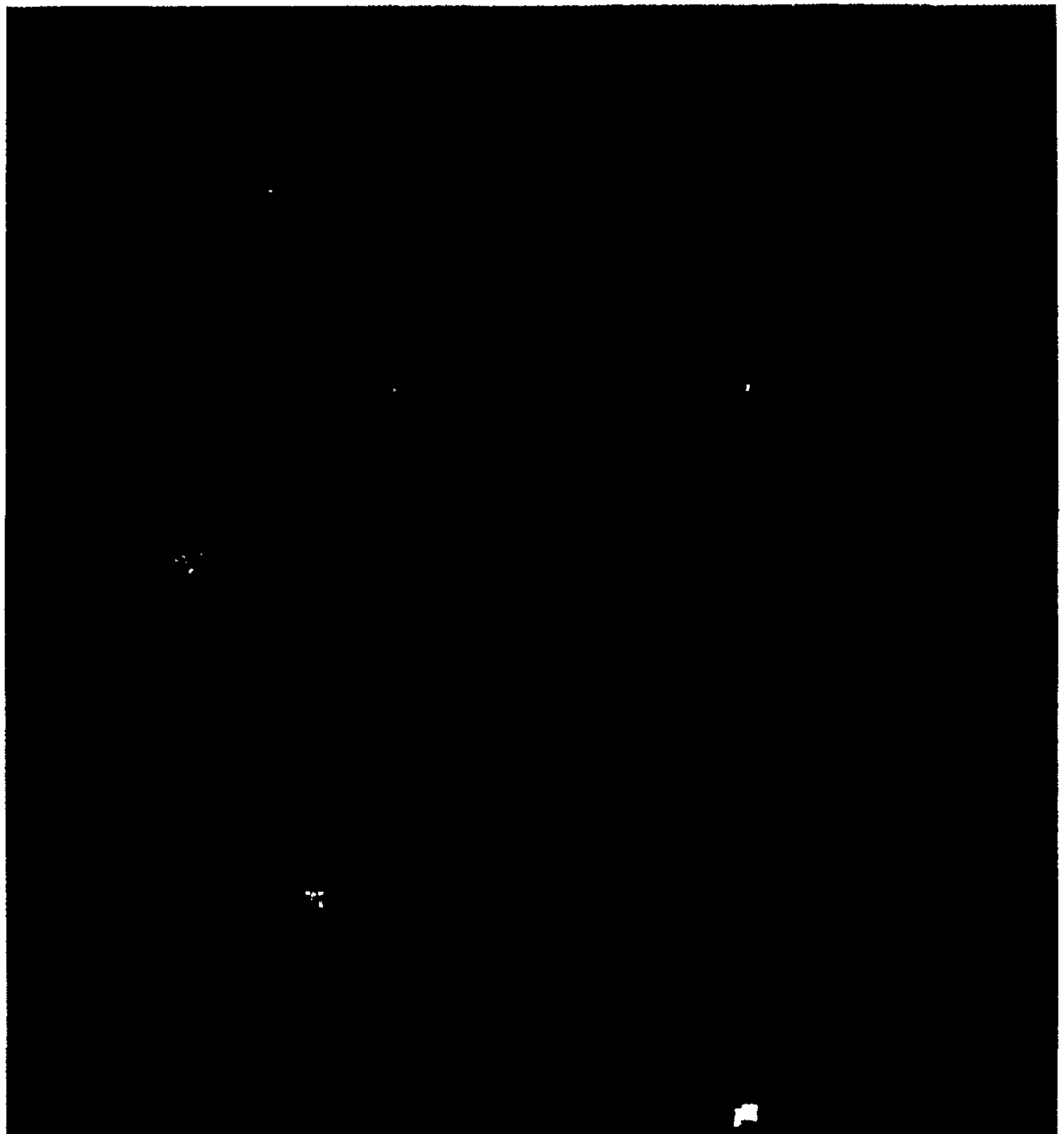
The southern fill area has expanded slightly to the north, while the eastern fill area (probable fill area, 1981) has been extended to the west. The only activity noted in either of the fill areas is seen on the southwestern edge of the site. A trench with two ground stains (GST) is located in this area. The ground [illegible] at the western edge of the trench indicates possible liquid fl[illegible] the end of the access road and flows downslope, stain[illegible] lecting at the bottom of the trench. The ground [illegible] eastern end of the trench could be standing liquid. Dump trailers and scrapers, are apparently stored at the southeastern edge of the fill area.

Many features can be seen at the site's central compound. Buildings 1 and 3-5 have not changed since 1981. A new building (B6) has been added at the eastern edge of the compound. Probable bulldozers are located south of this building. Vehicles and equipment can be seen along the eastern boundary of the compound.

A possible ground stain extends northwest from the north corner of Building 5. Several features of interest are located just northeast of this ground stain. A possible tank trailer and a possible vehicle are backed up to a smaller possible linear ground stain that parallels the previously mentioned possible ground stain. A second possible tank trailer and ground stain (not annotated) can also be seen near a shed in this area.

The dark area (1981) located south of Building 4 contains three very dark square features that could not be identified. The light-toned (LT) area south of Building 3 is composed of three light-toned possible mounds of material (not annotated).

AR500207



LEGEND

B - Building
DK - Dark-Toned
E - Equipment
FA - Fill Area
GST - Ground Stain
LT - Light-Toned
M - Material
SL - Standing Liquid
V - Vehicle
WF - Working Face
—— Access Road
—•— Ditched Drainage
—→— Drainage
...... Edge of Fill
------ Site Boundary

AR500208

FIGURE 6

KEYSTONE SANITATION LANDFILL JULY 12, 1984 APPROX SCALE 1:6,200

FRACTURE TRACE/LINEAMENT ANALYSIS

This section of the report presents a fracture trace/lineament analysis of the Keystone Sanitation Landfill. Fracture traces/lineaments are defined in this report as linear geologic features that can be identified on aerial photography as one or more of the following features: differences in vegetation growth or lushness; soil tonal variations; discontinuities in rock outcrops; and topographic features like straight stream segments and shallow grooves in the land surface. Care has been taken to exclude other linear geologic features, such as stratigraphic contacts, unconformities and linear igneous intrusives such as dikes.

Eleven fracture trace elements were identified in the vicinity of the site. Figure 7 shows the fracture trace elements, keyed to the 1981 photography. Each element or portions of each element are ranked using the following three categories: the solid line represents a strong fracture trace signature; the dash-dot line represents a moderate or probable fracture trace signature; the dashed line represents a weak or possible fracture trace signature.

AR500210

FIGURE 7
KEYSTONE SANITATION LANDFILL APRIL 2,1981 APPROX SCALE 1: 26,000

REFERENCES

AERIAL PHOTOGRAPHY

Date	Agency	Mission Code	Frame #	Orig. Scale	EPIC Frame #
June 11, 1964	ASCS[1]	AHC	5EE:98-100	1:20,000	10992:189-191
August 13, 1971	ASCS	AHC	3MM:213-215	1:20,000	10992:013-015
April 2, 1981	ASCS	NHAP80	439:42-44	1:58,000	10992:192-194
July 12, 1984	USFS[2]	-	84/076:239-241	1:32,500 Nadir	84/076:239-241

MAP

Source	Name	Scale	Date
USGS[3]	Littlestown, MD-PA	1:24,000	1971

[1]Agricultural Stabilization and Conservation Service, U.S. Department of Agriculture

[2]U.S. Forest Service, U.S. Department of Agriculture

[3]U.S. Geological Survey, U.S. Department of the Interior