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Environmental Protection
Agency

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TS-PIC-20502367S
April 2005

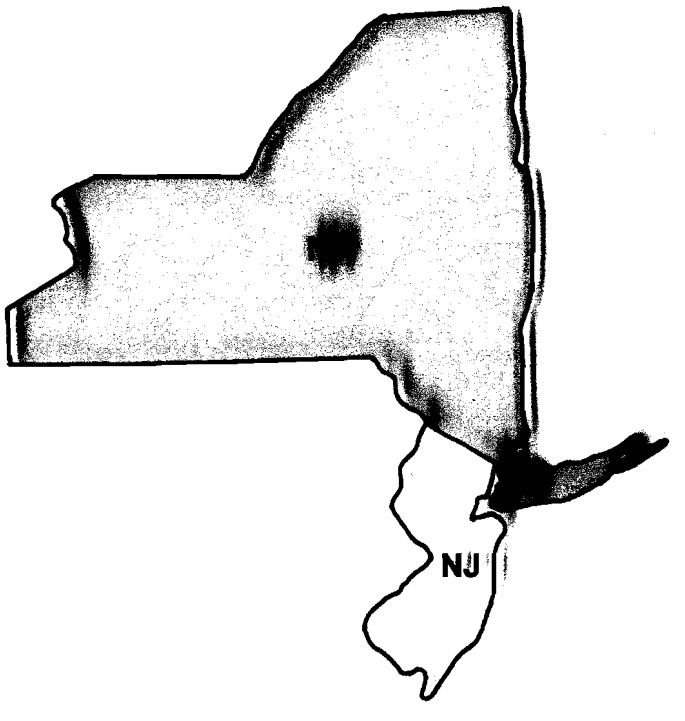
Research and Development

EPA

AERIAL PHOTOGRAPHIC ANALYSIS OF OLD BOOSEVELT FIELD CONTAMINATED GROUNDWATER AREA

Garden City, New York

EPA Region 2



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AERIAL PHOTOGRAPHIC ANALYSIS OF OLD ROOSEVELT FIELD CONTAMINATED GROUNDWATER AREA

Garden City, New York

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Contract No. 68-D-00-267

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ABSTRACT

This report presents the findings from a historical aerial photographic analysis of the Old Roosevelt Field Contaminated Groundwater Area located in Garden City, Nassau County, New York. Eighteen years of historical photographs were obtained, of which eight covering the period from 1938 through 1994 were reproduced for inclusion in this report. The purpose of this analysis is to document landscape morphology, patterns of hazardous waste disposal, and other observable conditions of environmental significance on this 219-hectare (542-acre) site. This report provides operational remote sensing support to U.S. Environmental Protection Agency (EPA) Region 2 for a site assessment under the Comprehensive, Environmental Response, Compensation, and Liability Act (CERCLA).

The photographic analysis presented in this report revealed the presence of an operational airfield, and solid waste deposition activity along an access road from 1938 through 1943. Buildings likely associated with maintenance and repair of aircraft, as well as open storage areas, standing liquid, and ground stains were noted during this time period. By 1952 the airfield was being dismantled and the site was in the process of having light-industrial and commercial complexes constructed on it. Solid waste, standing liquid, a trench (possibly being used for solid waste deposition), storage tanks, and retention basins were identified through 1994. Numerous storage tanks, drums, stains, and areas of solid waste were identified at off-site locations throughout the analysis period.

The EPA Environmental Sciences Division, Landscape Ecology Branch in Las Vegas, Nevada, prepared this report for the EPA Region 2 Hazardous Waste Management Division in New York, New York, and the EPA Office of Emergency and Remedial Response in Washington, D.C.

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INTRODUCTION

This report presents the findings from a historical aerial photographic analysis of the Old Roosevelt Field Contaminated Groundwater Area (CERCLIS ID# NYSFN0204234) located in Garden City, Nassau County, New York (Figures 1 and 2). Eighteen years of black-and-white, color, and color infrared historical aerial photographs were obtained to cover the period from 1938 through 2002 of which eight years (1938, 1940, 1943, 1947, 1952, 1959, 1976 and 1994) were reproduced and included in this report. The purpose of this analysis is to document landscape morphology, patterns of hazardous waste disposal, and other observable conditions of environmental significance at the site. This analysis and report provide operational remote sensing support for site assessment conducted by the Region 2 office of the U.S. Environmental Protection Agency (EPA) under the Comprehensive, Environmental Response, Compensation, and Liability Act (CERCLA).

The Old Roosevelt Field Contaminated Groundwater Area will be referred to as the "site" in this report.

The site covers approximately 219 hectares (542 acres) and is bounded by Old Country Road on the north, Clinton Road on the west, and a railroad on the south. Additional boundaries used in this analysis were determined from observations made on aerial photographs and collateral information, and do not necessarily denote legal property lines or ownership. The area surrounding the site is mainly used for residential and commercial purposes.

According to collateral information (EPA, 2004), Roosevelt Field was used for aviation activities by the U.S. military and commercial concerns from 1911 until May 1951, when it was closed. In 1952 Garden City installed two drinking water wells for residential use near the former airfield. In the late 1970s and early 1980s, water samples from both wells had shown elevated levels of tetrachloroethene (PCE), trichloroethene (TCE) and other contaminants.

The text of the aerial photographic analysis results is organized around three groupings, or complexes, of buildings. These complexes include buildings, sheds, a road network, and walkways. Thus, each associated set of features is described in the text as a "building complex."

In 1938 an active airfield, airplanes, and possible solid waste deposition were observed on the site. Possible and probable solid waste disposal activities continued alongside an access road through at least 1943. The airfield continued operations for many years, but in 1952, it became apparent that it was in the process of being dismantled. Many of the buildings associated with the airfield, however, remained intact. In addition, stains, standing liquid, probable solid waste, a possible and a probable solid waste disposal area, and open storage areas were identified. By 1959 the airfield and many of the buildings associated with it had been removed. New commercial buildings, light-industrial facilities, large retention basins, and the foundation of new infrastructure had been constructed. A probable trench was located on an undeveloped tract of land in the western part of the site. In 1976 the trench appeared to be used as a possible solid waste disposal area. In addition, small piles of solid waste, stains, storage tanks, debris, and possible drums were identified at various locations throughout the site. By 1994 debris and a possible stain were noted.

During the analysis period, activity of environmental significance was noted northwest and south of the site. Findings included numerous storage tanks, drums, solid waste, stains, and impoundments containing standing liquid.

A Glossary, defining features or conditions identified in this report, follows the Photographic Analysis section. Sources for all maps, aerial photographs, and collateral data used in the production of this report are listed in the References section. A list of all aerial photographs that were identified and evaluated for potential application to this study can be obtained by contacting the EPA Work Assignment Manager. Historical aerial photographs used in the analysis of this site have been digitally scanned and printed for use in this report. A transparent overlay with interpretative data is affixed to each of the digital prints. See the Methodology section for a discussion of the scanning and printing procedures.

The EPA Environmental Sciences Division, Landscape Ecology Branch in Las Vegas, Nevada, prepared this report for the EPA Region 2 Hazardous Waste Management Division in New York, New York, and the EPA Office of Emergency and Remedial Response in Washington, D.C.

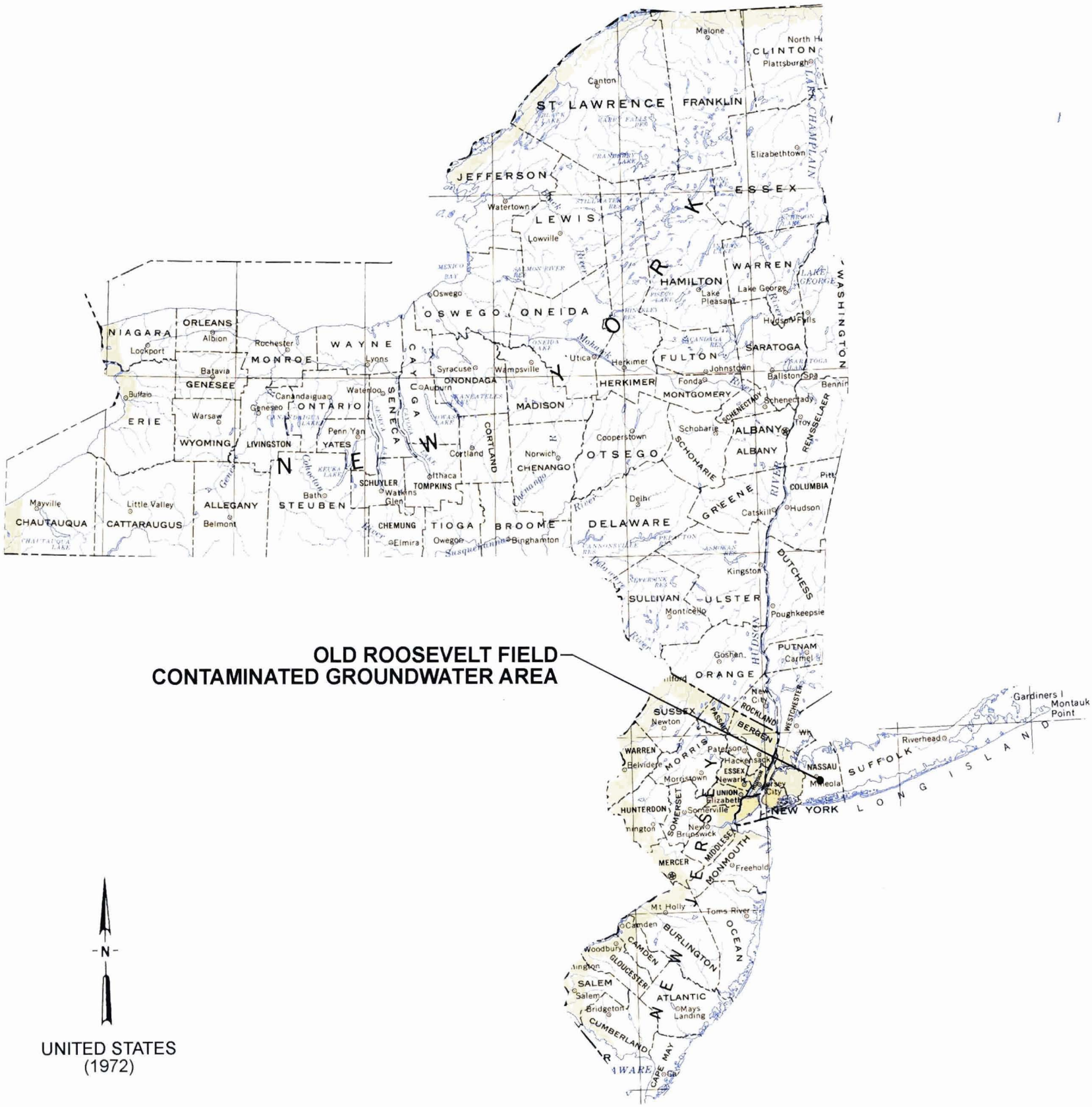

Figure 1. Study area location map, New York (USGS, 1972). Approximate scale 1:3,125,000.

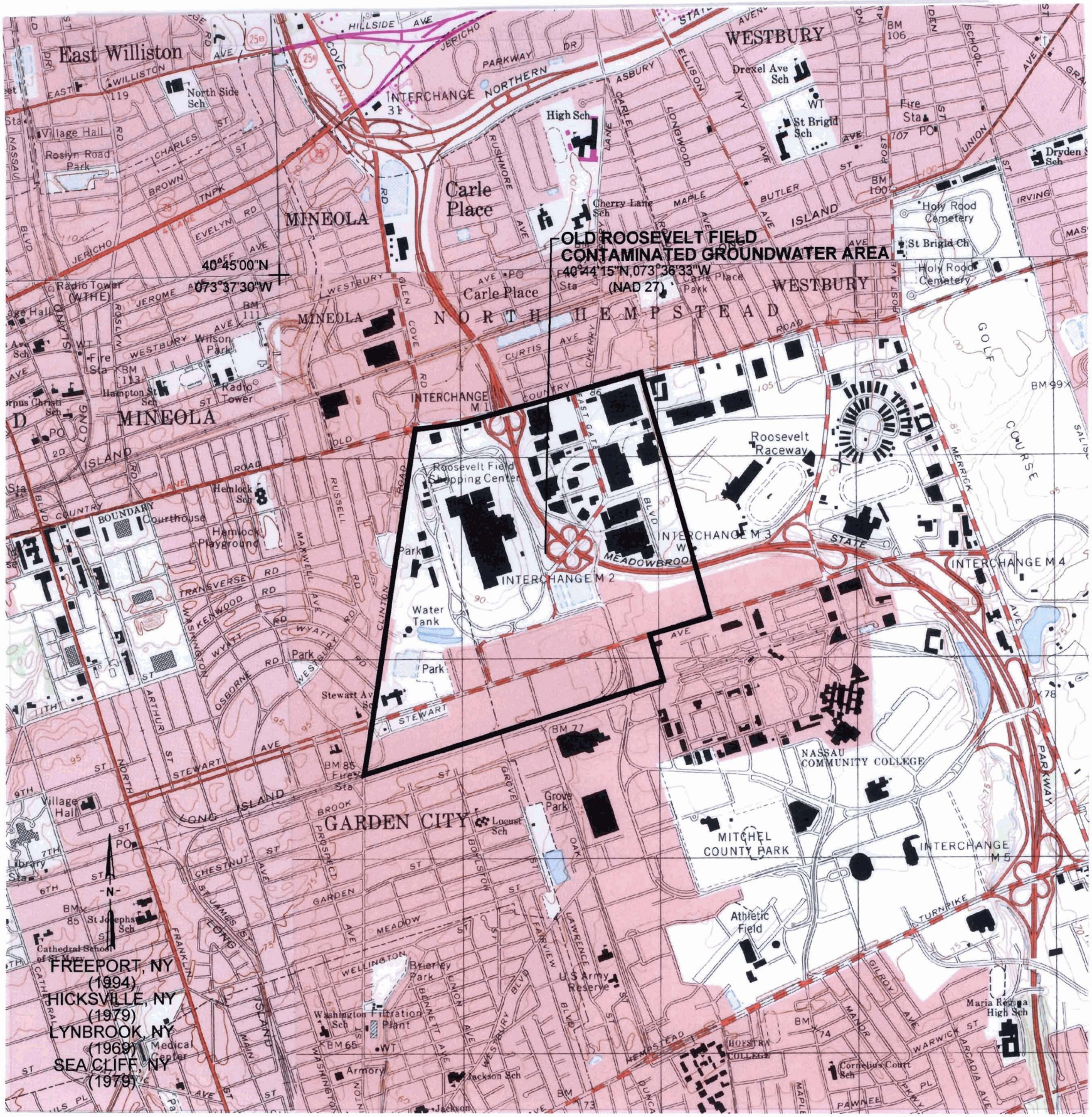

Figure 2. Local study area location map, Freeport, NY (USGS, 1994), Hicksville, NY (USGS, 1979), Lynbrook, NY (USGS, 1969), and Sea Cliff, NY (USGS, 1979). Approximate scale 1:24,000.

METHODOLOGY

This report was prepared using a standard methodology that includes the following steps:

- data identification and acquisition,
- photographic analysis and interpretation, and
- graphics and text preparation.

These steps are described below. Subsections also address details related to specific kinds of analyses that may be required to identify environmental features such as surface drainage and wetlands. All operational steps and processes used to perform this work (including data identification and acquisition, photographic analysis and interpretation, and graphics and text preparation) adhere to strict QA/QC guidelines and standard operating procedures (SOPs). These guidelines and procedures are documented in the Master Quality Assurance Project Plan (QAPP) prepared for Remote Sensing Support Services Contract No. 68-D-00-267 (LMS, 2004).

Data identification and acquisition included a search of government and commercial sources of historical aerial film for the study area. Photographs with optimal spatial and temporal resolution and image quality were identified for acquisition. In addition, U.S. Geological Survey (USGS) topographic maps were obtained to show the study area location and to provide geographic and topographic context.

To conduct this analysis, the analyst examined diapositives (transparencies) of historical aerial photographs showing the study area. Diapositives are most often used for analysis instead of prints because the diapositives have superior photographic resolution. They show minute details of significant environmental features that may not be discernible on a paper print.

A photographic analyst uses a stereoscope to view adjacent, overlapping pairs of diapositives on a backlit light table. In most cases, the stereoscope is capable of various magnifications up to 60 power. Stereoscopic viewing involves using the principle of parallax (observing a feature from slightly different positions) to observe a three-dimensional representation of the area of interest. The stereoscope enhances the photo interpretation process by allowing the analyst to observe vertical as well as horizontal spatial relationships of natural and cultural features.

The process of photographic analysis involves the visual examination and comparison of many components of the photographic image. These components include shadow, tone, color, texture, shape, size, pattern, and landscape context of individual elements of a photograph. The photo analyst identifies objects, features, and "signatures" associated with specific environmental conditions or events. The term "signature" refers to a combination of components or characteristics that indicate a specific object, condition, or pattern of environmental significance. The academic and professional training, photo interpretation experience gained through repetitive observations of similar features or activities, and deductive logic of the analyst as well as background information from collateral sources (e.g., site maps, geologic reports, soil surveys) are critical factors employed in the photographic analysis.

The analyst records the results of the analysis by using a standard set of annotations and terminology to identify objects and features observed on the diapositives. Significant findings are annotated on overlays attached to the photographic or computer-reproduced prints in the report and discussed in the accompanying text. Annotations that are self-explanatory may not be discussed in the text. The annotations are defined in the legend that accompanies each print and in the text when first used.

Objects and features are identified in the graphics and text according to the analyst's degree of confidence in the evidence. A distinction is made between certain, probable, and possible identifications. When the analyst believes the identification is unmistakable (certain), no qualifier is used. Probable is used when a limited number of discernible characteristics allow the

analyst to be reasonably sure of a particular identification. Possible is used when only a few characteristics are discernible, and the analyst can only infer an identification.

The prints in this report have been reproduced, either by photographic or computer methods, from the original film. Reproductions are made from the original film and may be either contact (the same size) prints or enlargements, depending on the scale of the original film. Any computer-produced prints used in this report are generated from scans of the film at approximately 1,600 dots per inch (dpi) and printed at 720 dpi. Although the reproductions allow effective display of the interpretive annotations, they may have less photographic resolution than the original film. Therefore, some of the objects and features identified in the original image and described in the text may not be as clearly discernible on the prints in this report.

Study area boundaries shown in this report were determined from aerial photographs or collateral data and do not necessarily denote legal property lines or ownership.

Color Infrared Photographs

Some photographs used for this analysis were made from color infrared film. Normal color film records reflected energy in the blue, green, and red portions of the electromagnetic spectrum. Color infrared film differs in that it is sensitive not only to reflected blue, green, and red energy, but also to reflected energy in the infrared portions of the electromagnetic spectrum; however, the blue energy is filtered out and only the green, red, and infrared energy is recorded. When color infrared film is processed, it displays "false" colors that do not correspond with the true colors of the features photographed. For example, features that are highly reflective in the infrared portion of the spectrum, such as healthy vegetation, appear red to magenta on color infrared film. The false color displayed by a feature is produced in accordance with the proportions of green, red, and infrared energy it reflects. These portions are referred to as the "spectral reflectance characteristics" of the feature. To interpret the true color of a particular feature accurately from color infrared film, a knowledge of the spectral reflectance

characteristics of that feature is required. This information is not readily available for the majority of features identified in this report. Therefore, unless otherwise indicated, no attempt has been made to interpret the true colors of the features identified on the color infrared film analyzed for this report.

Surface Drainage

The surface drainage analysis produced for this report identifies the direction and potential path that a liquid spill or surface runoff would follow based on the topography of the terrain and the presence of discernible obstacles to surface flow. The analyst determines the direction of surface drainage by stereoscopic analysis of the aerial photographs and by examining USGS topographic maps. Site-specific surface drainage patterns are annotated on the map or photo overlay. Where the direction of subtle drainage cannot be determined, an indeterminate drainage line symbol is used. Regional surface flow is ascertained from the USGS topographic maps.

PHOTOGRAPHIC ANALYSIS

The Old Roosevelt Field Contaminated Groundwater Area is located in Garden City, Nassau County, New York. The area covers approximately 219 hectares (542 acres) and is bounded by Old Country Road to the north, Clinton Road to the west, and a railroad line to the south (Figure 2). Meadowbrook State Parkway curves through the eastern and northern portions of the site. Elevations range from approximately 30 meters (100 feet) above sea level along Old Country Road to about 24 meters (80 feet) near the railroad line (USGS, 1994). Surface runoff trends to the south.

Several conventions are used in this report. These are described below.

Building Complexes - The text of the aerial photographic analysis is organized around the groupings or complexes of buildings of varying sizes. Building complexes are annotated as BC. When activity is first observed at each of these building complexes, a numerical designator is sequentially assigned. These building complexes defined in this analysis, of which there are a total of three, will be discussed sequentially, rather than by geographic location. Significant changes or additions to the complexes, including significant expansion in areal extent, will be described in the text as observed.

Ground scars, disturbed ground, light-toned material, cleared areas, and building foundations - Ground scars, disturbed ground, light-toned material, cleared areas, and building foundations are noted at various times within the building complexes. However, because of the limitations associated with the scale of the photographic prints, only the largest of these features, in terms of size or areal extent, are annotated and discussed in the text.

Many of the figures in this report are mosaics of photographs. Photomosaicking is the process by which a set of photographic images--which collectively, but not individually, comprise a given scene or geographic area--are "stitched" or pieced together either by digital or mechanical techniques. Figures created using this procedure are documented when applicable.

AUGUST 3, 1938 (FIGURE 3)

This image is a mosaic comprised of two individual photographs acquired on the same day.

Building Complex-1 (BC-1) is located along Old Country Road in the northern part of the Old Roosevelt Field Contaminated Groundwater Area ("the site") and is mainly comprised of six large, square-shaped buildings (not annotated), a building foundation (BF), and a section of the airfield tarmac (not annotated). The size, shape, and location of these buildings relative to the tarmac and to the airfield to the south suggest these buildings are hangars used for storage, repair, and maintenance of airplanes (AP; not individually annotated) visible nearby. Stains (ST; not individually annotated) and a possible stain are also noted. Just to the east of this building complex, there are several trails that extend to the east toward an excavation (EX) containing standing liquid (SL). South and southwest of this complex, a total of three patches of dark-toned material (DTM) are noted.

Building Complex-2 (BC-2) is located in the northwestern and western parts of the site, adjacent to Old Country and Clinton roads. Several buildings of various sizes, probably used for maintenance and repair of airplanes, and offices (buildings not annotated) comprise this complex. Numerous vehicles (VEH; partially annotated) are noted near several of the buildings, and airplanes are visible near the tarmac (not annotated). Three building foundations, two of which are showing dark-toned material on their surface, are noted along Old Country Road in the northern portion of this building complex. Probable building foundations and ground scars (GS), possibly related to building removal, are visible in the southern portion of this complex adjacent to Clinton Road. Access Road-1 (AR-1) connects this building complex to the far-eastern portion of Building Complex-1, and also separates the airfield from

the golf course to the south, where a cleared area (CA) is noted near an unnamed road. Adjacent to this access road, several road spurs are visible. Near this access road and the spurs there are several cleared areas and ground scars. The southernmost ground scar appears to be used as a possible solid waste disposal area (SWDA). Two excavations are also visible. The southernmost excavation contains possible standing liquid. Abutting the eastern boundary of the site, there is a large cleared area. An excavation containing possible dark-toned material is noted.

In the southwestern part of the site, just south of Building Complex-2, a third excavation is observed. Only the northwestern corner of the excavation appears active, indicated by the light-toned material (not annotated) on its surface. The remaining section of the excavation is covered with vegetation (VEG) and does not appear to have been recently disturbed. East of the excavation, there are approximately ten residences (RES), several building foundations (partially annotated), and a ground scar. A school is observed south of the excavation. The school will continue to be annotated on subsequent overlays, but will no longer be discussed in the text unless changes of environmental significance are observed.

In the southwestern part of the site Building Complex-3 (BC-3) is observed along Clinton Road, Stewart Avenue, and the railroad. A light-industrial facility (not annotated) is noted in the extreme western portion of this building complex. Possible standing liquid, a smokestack (SS), small patches of disturbed ground (DG), and ground scarring are visible at this facility. To the east there are a possible electrical substation (ES), a large vertical storage tank (VT), and a possible stain. Another stain is noted just east of Building Complex-3, as are two small groupings of residences adjacent to Stewart Avenue.

Immediately northwest of the site, there is an excavation and dark-toned material in a residential area adjacent to agricultural fields (AG). South of the site and proximal to the railroad, there are a total of 13 vertical storage tanks, 11 probable vertical storage tanks, 10 horizontal storage tanks (HT), 13 probable horizontal storage tanks, 10 possible horizontal storage tanks, and an airfield.

INTERPRETATION CODE

	SITE BOUNDARY
	DRAINAGE
	INDETERMINATE DRAINAGE
	VEHICLE ACCESS
	RAILROAD
	EXCAVATION/PIT (EXTENSIVE)
	MOUNDED MATERIAL (EXTENSIVE)
AG	AGRICULTURAL
AP	AIRPLANES
AR	ACCESS ROAD
BC	BUILDING COMPLEX
BF	BUILDING FOUNDATION
CA	CLEARED AREA
CIR	CIRCULAR
CONT	CONTAINER(S)
CR	CRATE(S)
CYL	CYLINDRICAL
DB	DEBRIS
DEP	DEPRESSION
DG	DISTURBED GROUND
DR	DRUMS
DT	DARK-TONED
ES	ELECTRICAL SUBSTATION
EX	EXCAVATION
FA	FILL AREA
GR	GRADED AREA
GS	GROUND SCAR
HE	HEAVY EQUIPMENT
HT	HORIZONTAL TANK
IM	IMPOUNDMANT
LIN	LINEAR
LT	LIGHT-TONED
M	MATERIAL
MM	MOUNDED MATERIAL
MT	MEDIUM-TONED
OBJ	OBJECT
OF	OUTFALL
OS	OPEN STORAGE AREA
OVHD	OVERHEAD
PV	PARTIALLY VEGETATED
RB	RUBBLE
RECT	RECTANGULAR
RES	RESIDENCE(S)
SL	STANDING LIQUID
SS	SMOKESTACK
ST	STAIN
SW	SOLID WASTE
SWDA	SOLID WASTE DISPOSAL AREA
TKS	TANKS
TR	TRENCH
UO	UNIDENTIFIED OBJECT
VEG	VEGETATION
VEH	VEHICLE
VT	VERTICAL TANK

Figure 3. Old Roosevelt Field Contaminated Groundwater Area, August 3, 1938. Approximate scale 1:11,070.

NOVEMBER 14, 1940 (FIGURE 4)

Full stereoscopic coverage was not available for the northern part of the Old Roosevelt Field Contaminated Groundwater Area. Therefore, a detailed analysis could not be performed for this location.

The six square-shaped buildings (hangars), several stains (not individually annotated), a building foundation, and several airplanes and vehicles (not annotated) remain noted at Building Complex-1 in the northern part of the site. Immediately to the east of this building complex, a dirt road (not annotated) extends east to a pool of standing liquid. A possible drainage ditch extends east from the corner of the tarmac and connects to the standing liquid. Near the pool of liquid there are dark-toned material and light-toned material (LTM). This light-toned material may indicate additional excavated material from the excavation seen in the 1938 photograph, but due to the lack of stereo coverage for this part of the site, this cannot be confirmed. South of this building complex, there are large areas of probable saturated material where dark-toned material was previously noted.

At Building Complex-2 numerous aircraft and vehicles (neither feature annotated) are located proximal to several buildings and the tarmac. Dark-toned material remains visible on one of the three building foundations along Old Country Road, as does a cylindrical-shaped object (CYL OBJ). To the east there are a possible pit containing possible standing liquid and a patch of dark-toned material. Another patch of dark-toned material is observed just to the south of the building complex. In the southern portion of this complex, adjacent to Clinton Road, numerous ground scars (possibly related to building removal) and light-toned mounded material (LTMM) are noted.

Access Road-1 continues to connect Building Complex-2 to the far-eastern part of Building Complex-1, as well as to separate the airfield from the golf course. Several road spurs remain visible along Access Road-1. Near the eastern site boundary, two road spurs are seen connecting the excavation and probable solid waste disposal area, and two large ground scars, to Access Road-1. To the south, proximal to the access road, there are two ground scars, the northernmost of which contains an excavation area. Spurs also extend to a

possible solid waste disposal area in which debris (DB) is observed, as well as connecting to an excavation where dark-toned material is noted. South of the golf course, the cleared area seen in 1938 remains visible. Two mounds of medium-toned material (MTMM) are located between the cleared area and the unnamed road.

In the southwestern part of the site, south of Building Complex-2, a dry retention basin is observed. The areal extent of the basin is larger than the excavation seen in this location in 1938. Materials that may have been removed to enlarge the basin are noted to the east in the form of piles of uniform light- and dark-toned material (LTMM, DTMM). East of the retention basin there are approximately ten residences and numerous ground scars (partially annotated) likely resulting from the removal of former buildings. North of these ground scars, adjacent to the unnamed road, a small, dry rectangular-shaped probable impoundment (IM) is observed.

In the southern part of the site, the limits of Building Complex-3 have been expanded to the eastern boundary of the site as a result of new activity. A light-industrial facility (not annotated) with a smokestack remains in the western portion of this building complex. Probable solid waste (SW) is visible on the north side of the facility. Similar probable waste products are seen to the east of the smokestack. A dirt road extends around the east side of the facility and connects both of these probable waste locations. A spur of this dirt road is apparently being utilized to transport materials to a probable solid waste disposal area located in a pit along the railroad line at the southern site boundary. In the open field (not annotated) to the north, there are several small ground scars (partially annotated) and a second dirt road, which extends southeast from Stewart Avenue and terminates at a patch of disturbed ground. Farther east, near the central portion of this building complex, probable debris is observed near a new building (not annotated). On the east side of this building, a short dirt road terminates at a pit. Just to the south of the pit, there are numerous rectangular-shaped ground scars (probable concrete pad remnants). To the east are the electrical substation and the large vertical storage tank seen in the 1938 photograph. Southeast of the vertical storage tank there is a fill area (FA) where multi-toned material has been deposited. Located nearby is a small patch of light-toned material

and a pile of probable debris and rubble (RB). On the east side of the building complex a small residential area and an individual residence front Stewart Avenue. An extensive fill area is now located south of the single residence and four new buildings (not annotated) are observed just to the east.

Immediately northwest of the site, dark-toned material is noted at a light-industrial facility (not annotated). South of the site, proximal to the railroad, a total of 24 vertical storage tanks, 25 horizontal storage tanks, 7 probable horizontal storage tanks, and 1 possible horizontal storage tank are noted.

INTERPRETATION CODE

	SITE BOUNDARY
← — —	DRAINAGE
— ↔ —	INDETERMINATE DRAINAGE
====	VEHICLE ACCESS
+++++	RAILROAD
	EXCAVATION/PIT (EXTENSIVE)
	MOUNDED MATERIAL (EXTENSIVE)
AG	AGRICULTURAL
AP	AIRPLANES
AR	ACCESS ROAD
BC	BUILDING COMPLEX
BF	BUILDING FOUNDATION
CA	CLEARED AREA
CIR	CIRCULAR
CONT	CONTAINER(S)
CR	CRATE(S)
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DB	DEBRIS
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ES	ELECTRICAL SUBSTATION
EX	EXCAVATION
FA	FILL AREA
GR	GRADED AREA
GS	GROUND SCAR
HE	HEAVY EQUIPMENT
HT	HORIZONTAL TANK
IM	IMPOUNDMANT
LIN	LINEAR
LT	LIGHT-TONED
M	MATERIAL
MM	MOUNDED MATERIAL
MT	MEDIUM-TONED
OBJ	OBJECT
OF	OUTFALL
OS	OPEN STORAGE AREA
OVHD	OVERHEAD
PV	PARTIALLY VEGETATED
RB	RUBBLE
RECT	RECTANGULAR
RES	RESIDENCE(S)
SL	STANDING LIQUID
SS	SMOKESTACK
ST	STAIN
SW	SOLID WASTE
SWDA	SOLID WASTE DISPOSAL AREA
TKS	TANKS
TR	TRENCH
UO	UNIDENTIFIED OBJECT
VEG	VEGETATION
VEH	VEHICLE
VT	VERTICAL TANK

Figure 4. Old Roosevelt Field Contaminated Groundwater Area, November 14, 1940. Approximate scale 1:11,070.

JUNE 23, 1943 (FIGURE 5)

Full stereoscopic coverage is available for the Old Roosevelt Field Contaminated Groundwater Area.

Building Complex-1 in the northern part of the site remains active. A large number of airplanes, vehicles, heavy equipment (HE), and stains are visible near the six square-shaped buildings (hangars) and tarmac (features are not individually annotated). Since 1940 several smaller buildings (not annotated) have been constructed in the eastern portion of the building complex. In addition, the building foundation noted in previous photographs has been converted to a large open storage area (OS) comprised of large containers (CONT) and unidentified objects (UO). Scattered stains are also visible. Immediately to the east of this building complex, the large excavation seen in 1938 (stereo coverage was not available for 1940) is again visible and is being utilized for solid waste disposal. However, unlike the 1938 and 1940 photographs where standing liquid was noted in this location, the excavation is now dry. This is possibly because of an extensive east-west oriented drainage ditch that may be diverting surface drainage, which traverses the northern portion of the site, into Building Complex-2. In addition, a possible drainage ditch is noted south of the excavation. A small pit, a ground scar, two possible containers, and two possible containers are also observed in this location. South of Building Complex-1, there are three areas of stained ground and a large assemblage of airplanes and associated stained ground.

Building Complex-2 also remains active, as numerous airplanes (partially annotated), vehicles (not annotated), and stains are located proximal to several of the buildings and the tarmac (not annotated). In the northern portion of this complex, adjacent to Old Country Road, there is a drainage ditch, a patch of dark-toned material, light-toned material, possible standing liquid, six circular (CIR)-shaped ground scars, a dark-toned object (DT OBJ), possible debris, and a probable stain. The cylindrical-shaped object seen in 1940 remains visible, adjacent to which are two possible horizontal storage tanks. Possible standing liquid is observed near Clinton Road and in the southern portion of the building complex, there is a small pool of standing liquid and associated drainage ditch. Farther south are ground scars, disturbed ground, and possible rubble.

Access Road-1 continues to connect Building Complex-2 to the far-eastern part of Building Complex-1, as well as to separate the golf course from the airfield. Several ground scars are noted on the eastern portion of the airfield. Two road spurs continue to connect the access road to a large area of disturbed ground and ground scars along the eastern site boundary. Within this area a pit and numerous, dump-truck-sized mounds of light- and medium-toned material are noted. These mounds are devoid of vegetation, suggesting recent deposition. Also visible is a graded fill area where, in 1940, an excavation and solid waste deposition were identified. The northwest-southeast oriented runway is in the process of being extended across Access Road-1, where several spurs (partially annotated) remain noted. Connected to the runway is a large ground scar where a pit is being utilized for possible solid waste deposition. Smaller ground scars and a collection of small piles of dark-toned material are noted near the access road. Material has also been removed from the excavation area and may have been transported and used for runway extension and/or for filling and covering the pit to the south. To the southwest, south of the golf course, a large ground scar is located near the unnamed road where, in 1940, a cleared area was visible. A grouping of dump-truck-sized mounds of uniform light-toned material is also observed. These mounds are devoid of vegetation, suggesting recent deposition. Possible mounded material is located in the same location where, in 1940, medium-toned mounded material was identified. The ground surface of the possible mound appears partially vegetated (PV), suggesting the material has not been disturbed for several years.

In the southwestern part of the site, south of Building Complex-2, the dry retention basin, approximately ten residences, a patch of dark-toned material, and numerous ground scars likely resulting from the removal of former buildings are observed. In 1940 uniform light- and dark-toned materials were observed just east of the basin. These materials are no longer visible, and the area is now graded (GR) and mostly devoid of vegetation. Adjacent to the unnamed road, there is a possible impoundment where, in 1940, a small rectangular-shaped probable impoundment was observed.

In the southern part of the site, the light-industrial facility (not annotated) with a smokestack remains in the western portion of Building Complex-3. On the east side of the facility, there is an area composed of ground scars, disturbed ground, and small patches of dark-toned material. In the open field (not annotated) to the east, one of the two dirt roads noted on the 1940 photograph is visible. This dirt road, which terminated at a patch of disturbed ground in 1940, now extends farther southeast to a depression and the fill area comprised of multi-toned material. A probable solid waste disposal area was noted in this location in 1940. Farther east, near the central portion of this building complex, the grouping of rectangular-shaped ground scars, electrical substation, and large vertical storage tank remain. The short dirt road and pit noted in 1940 are no longer discernible. Southeast of the vertical storage tank, a ground scar is noted where, in 1940, a fill area composed of multi-toned material was located. The small patch of light-toned material and pile of probable debris and rubble noted nearby in 1940 cannot be discerned. Continuing to the east, the small grouping of residences and the single residence adjacent to Stewart Avenue remain. Numerous stains are associated with buildings (not annotated) constructed on the former fill area since 1940. In the far-eastern part of the site, between the unnamed road and Stewart Avenue, there are areas of light-toned material and ground scars, as well as a patch of dark-toned material.

Immediately northwest of the site, probable standing liquid and possible stains are noted at the light-industrial facility (not annotated). South of the site and proximal to the railroad, there are a total of 24 vertical storage tanks, 30 horizontal storage tanks, and one possible horizontal storage tank.

INTERPRETATION CODE

	SITE BOUNDARY
	DRAINAGE
	INDETERMINATE DRAINAGE
	VEHICLE ACCESS
	RAILROAD
	EXCAVATION/PIT (EXTENSIVE)
	MOUNDED MATERIAL (EXTENSIVE)
AG	AGRICULTURAL
AP	AIRPLANES
AR	ACCESS ROAD
BC	BUILDING COMPLEX
BF	BUILDING FOUNDATION
CA	CLEARED AREA
CIR	CIRCULAR
CONT	CONTAINER(S)
CR	CRATE(S)
CYL	CYLINDRICAL
DB	DEBRIS
DEP	DEPRESSION
DG	DISTURBED GROUND
DR	DRUMS
DT	DARK-TONED
ES	ELECTRICAL SUBSTATION
EX	EXCAVATION
FA	FILL AREA
GR	GRADED AREA
GS	GROUND SCAR
HE	HEAVY EQUIPMENT
HT	HORIZONTAL TANK
IM	IMPOUNDMANT
LIN	LINEAR
LT	LIGHT-TONED
M	MATERIAL
MM	MOUNDED MATERIAL
MT	MEDIUM-TONED
OBJ	OBJECT
OF	OUTFALL
OS	OPEN STORAGE AREA
OVHD	OVERHEAD
PV	PARTIALLY VEGETATED
RB	RUBBLE
RECT	RECTANGULAR
RES	RESIDENCE(S)
SL	STANDING LIQUID
SS	SMOKESTACK
ST	STAIN
SW	SOLID WASTE
SWDA	SOLID WASTE DISPOSAL AREA
TKS	TANKS
TR	TRENCH
UO	UNIDENTIFIED OBJECT
VEG	VEGETATION
VEH	VEHICLE
VT	VERTICAL TANK

Figure 5. Old Roosevelt Field Contaminated Groundwater Area, June 23, 1943. Approximate scale 1:11,210.

SEPTEMBER 1, 1947 (FIGURE 6)

Building Complex-1 in the northern part of the Old Roosevelt Field Contaminated Groundwater Area remains active; however, the number of airplanes and vehicles have been greatly reduced since 1943. Stains (not individually annotated) remain visible adjacent to several of the six square-shaped buildings, tarmac (not annotated), and building foundation. The building foundation converted into an open storage area on the 1943 photograph is no longer being used for that purpose and all stored materials have been removed. East of this building complex, possible dark-toned mounded material, ground scars (not individually annotated), and the excavation are noted. The areal extent of the excavation, as compared to 1943, has been reduced. A probable drainage ditch located between the tarmac and the excavation now appears to channel runoff into the excavation, although no standing liquid is noted in it. A faint linear ground scar (not annotated) is located where an extensive east-west oriented drainage ditch was discerned in 1943. In the airfield to the south of Building Complex-1, numerous possible stains are located where, in 1943, a large assemblage of airplanes was apparent.

Building Complex-2 remains active; however, the number of airplanes and vehicles (features not annotated) are greatly reduced as compared to the 1943 photograph. Stains, probable stains, standing liquid, a ground scar, and a possible ditch are noted scattered throughout the complex. In the northern portion of this complex, two building foundations remain, one of which contains dark-toned material on its surface. Adjacent to Old Country Road, a probable horizontal storage tank is located alongside an excavation of similar size. Uniform light-toned mounded material is noted adjacent to the excavation. The lack of vegetation atop this mound suggests earthmoving activities have been recent. Just to the south are three possible horizontal storage tanks and a possible dark-toned cylindrical-shaped object. In the central portion of this complex are a possible building foundation and the outer walls (not annotated) of a former structure. Within these walls dark-toned material is noted. Near Clinton Road, in the southern portion of this building complex, there is a large area comprised of debris and rubble.

Access Road-1 connects Building Complex-2 to the far-eastern part of Building Complex-1, as well as separates the golf course from the airfield. The southeast extension of the runway noted in 1943 has been completed. Two sizable and another smaller partially vegetated ground scars are located proximal to the access road. Excavation activity observed at the northernmost ground scar has slowed or ceased. The southernmost ground scar is visible in the former location of the possible solid waste disposal area noted on the 1943 photograph. Between the golf course and the unnamed road to the south, the ground scar and uniform light-toned mounded material noted in the 1943 photograph remain. Vegetation cannot be discerned on the surface of the mound of light-toned material, suggesting recent deposition activity. The possible mounded material noted previously is no longer noted.

In the southwestern part of the site, south of Building Complex-2, the dry retention basin, approximately ten residences, numerous ground scars, and the possible dry impoundment are observed.

The northern limits of Building Complex-3 have been expanded to incorporate new activity. The light-industrial facility (not annotated) with a smokestack remains in the western portion of this building complex. Proximal to the facility, a large ground scar and possible and probable stains are noted. In the open field (not annotated) to the east, the depression and fill area noted on the 1943 photograph can no longer be discerned. Near the central portion of this building complex, a new railroad spur has been constructed and a small patch of partially vegetated disturbed ground, light-toned mounded material, the electrical substation, a large vertical storage tank, a possible stain, and ground scars are noted. Ground scars remain in the location where a fill area composed of multi-toned material was previously observed. Farther east there are the small grouping of residences, the individual residence, probable debris, and possible stains. To the north, between Stewart Avenue and the unnamed road, a large U-shaped railroad spur has been constructed which extends to a new building (not annotated) with a smokestack. Proximal to the building a possible horizontal storage tank and a large, graded fill area are noted. To the east there is a large staging area likely comprised of building construction materials. In an adjacent, extensive cleared area there are several large piles of medium-toned material (not individually annotated)

possibly composed of vegetation and earth (not annotated), possible standing liquid, and a possible pit containing light-toned material. Off site, immediately southeast of this cleared area, there are three horizontal storage tanks.

Immediately northwest of the site, possible stains remain at the light-industrial facility (not annotated). South of the site, proximal to the railroad are a total of 28 vertical storage tanks and 27 horizontal storage tanks.

INTERPRETATION CODE

———	SITE BOUNDARY
←— — —	DRAINAGE
—<→—	INDETERMINATE DRAINAGE
====	VEHICLE ACCESS
+++++	RAILROAD
	EXCAVATION/PIT (EXTENSIVE)
	MOUNDED MATERIAL (EXTENSIVE)

AG	AGRICULTURAL
AP	AIRPLANES
AR	ACCESS ROAD
BC	BUILDING COMPLEX
BF	BUILDING FOUNDATION
CA	CLEARED AREA
CIR	CIRCULAR
CONT	CONTAINER(S)
CR	CRATE(S)
CYL	CYLINDRICAL
DB	DEBRIS
DEP	DEPRESSION
DG	DISTURBED GROUND
DR	DRUMS
DT	DARK-TONED
ES	ELECTRICAL SUBSTATION
EX	EXCAVATION
FA	FILL AREA
GR	GRADED AREA
GS	GROUND SCAR
HE	HEAVY EQUIPMENT
HT	HORIZONTAL TANK
IM	IMPOUNDMANT
LIN	LINEAR
LT	LIGHT-TONED
M	MATERIAL
MM	MOUNDED MATERIAL
MT	MEDIUM-TONED
OBJ	OBJECT
OF	OUTFALL
OS	OPEN STORAGE AREA
OVHD	OVERHEAD
PV	PARTIALLY VEGETATED
RB	RUBBLE
RECT	RECTANGULAR
RES	RESIDENCE(S)
SL	STANDING LIQUID
SS	SMOKESTACK
ST	STAIN
SW	SOLID WASTE
SWDA	SOLID WASTE DISPOSAL AREA
TKS	TANKS
TR	TRENCH
UO	UNIDENTIFIED OBJECT
VEG	VEGETATION
VEH	VEHICLE
VT	VERTICAL TANK

Figure 6. Old Roosevelt Field Contaminated Groundwater Area, September 1, 1947. Approximate scale 1:11,105.

FEBRUARY 10, 1952 (FIGURE 7)

This image is a mosaic comprised of two individual photographs of the Old Roosevelt Field Contaminated Groundwater Area acquired on the same day.

The limits of Building Complex-1 have been expanded to the east and south to incorporate new activity. However, the building complex no longer appears to be used for the maintenance and repair of aircraft, as no airplanes are present. A large container is observed on the tarmac (not annotated) south of the westernmost of the five remaining square-shaped buildings. Dark-toned material, possible stains, and a probable pit are located adjacent to a large building (not annotated) under construction in the northeast portion of the complex. Numerous mounds composed of uniform light- and medium-toned material are scattered throughout the central and southern portions of the complex. Immediately west of the complex, there is a grouping of ground scars.

Only one airplane is visible at Building Complex-2 and, similar to Building Complex-1, this complex no longer appears to be engaged in large-scale aircraft maintenance and repair activities. In the northern part of this complex, adjacent to Old Country Road, there are two open storage areas. The easternmost storage area is enclosed and is comprised of unidentified rectangular-shaped (RECT) objects. Numerous large containers comprise the westernmost storage area. Two patches of dark-toned material and a cylindrical-shaped object are noted to the east. In the southern portion of the building complex, stains are visible at a third open storage area, which is also comprised of small probable containers/crates. This information was gathered from photographs acquired in 1953 which are not included in this report (see References section). In the central portion of the complex are the outer walls of a former structure (annotated as BF). The base of the former structure has been removed or has deteriorated, suggesting an older building had been present at this location. Farther south are a probable depression (DEP) containing dark-toned material and a large stain adjacent to a building (not annotated). Also noted is a deep trench (TR) that directs runoff from the tarmac (not annotated) into a depression (not annotated) containing standing liquid. This liquid was also present on previous photographs. Immediately to the south, there is large area comprised of ground scars, disturbed ground, debris, light-toned material, probable rubble, and mounded material covered with vegetation.

Access Road-1 appears to connect Building Complex-2 to Building Complex-1 as well as to separate the golf course from the airfield. This access road terminates just south of Building Complex-1, where numerous tire tracks and ruts (not annotated) are visible on the surface of an excavation that did not appear active in 1947. Immediately south of the excavation, a probable pit and a ground scar are observed. The golf course is overgrown with vegetation and appears to be inactive. A paved section of the airfield is in the process of being removed, indicating that the northeast-southwest oriented runway will no longer be utilized for air transportation. Heavy equipment is also visible and is further indication of future changes to the site.

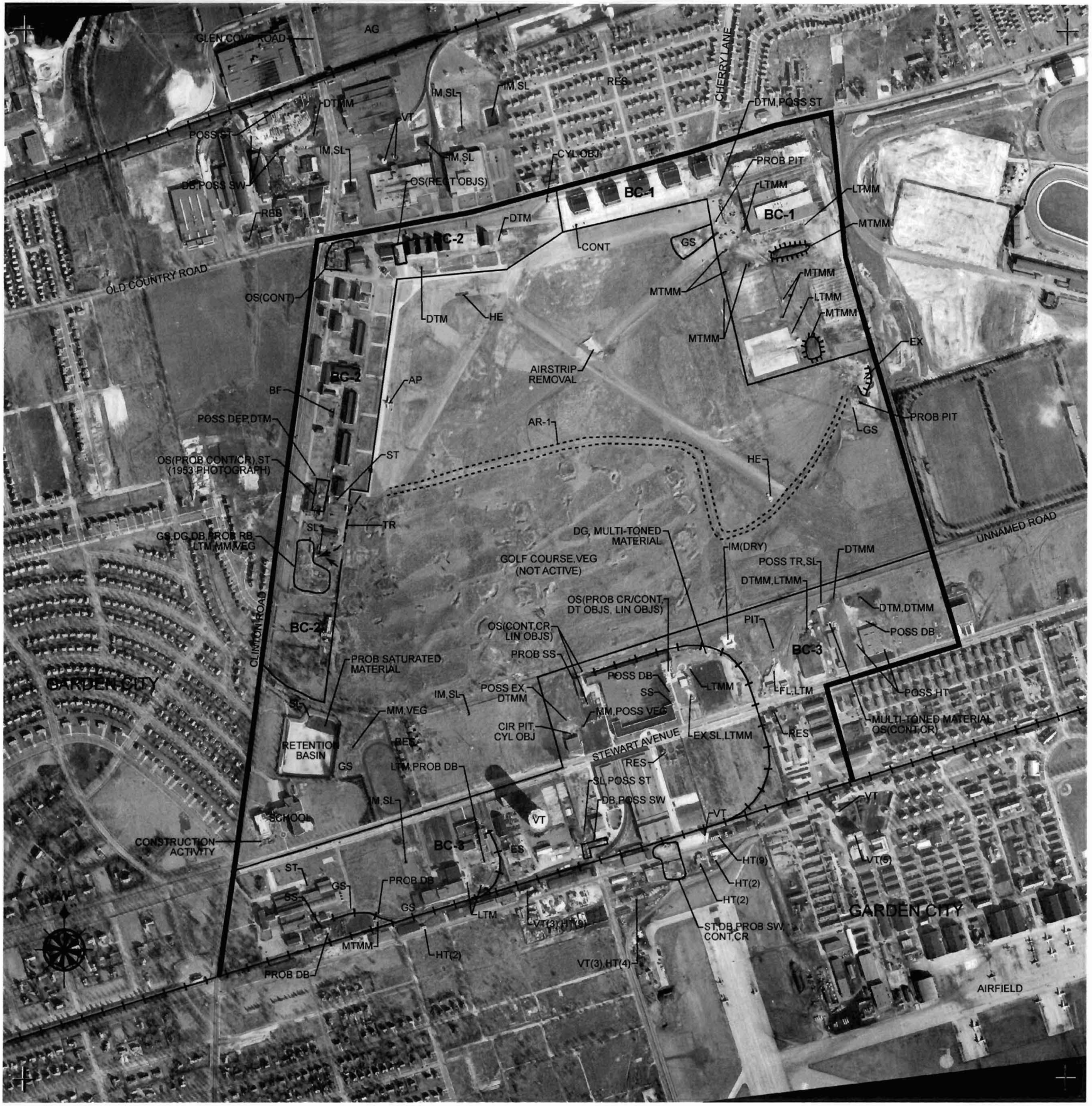
In the southwestern part of the site, south of Building Complex-2, standing liquid and probable saturated material are observed in the extreme northern part of the retention basin. In the field (not annotated) immediately east of the retention basin, ground scars are noted as are several small mounds of material covered with vegetation (Note: due to photographic scale limitations, features are not individually annotated). The mounds do not appear to have recently been disturbed. Farther east approximately ten residences and an impoundment containing standing liquid are observed. South of the retention basin, construction activity is noted at the school.

The limits of Building Complex-3 have again been expanded to the northeast to incorporate new activity. The light-industrial facility (not annotated) with a smokestack remains in the western portion of this complex. On the north side of the facility is stained ground and just south of the smokestack is probable debris. A new east-west oriented rail spur connects the eastern section of the facility to the main railroad. Proximal to the rail spur there are medium-toned mounded material, probable debris, and ground scars. The easternmost ground scar is located where a fill area was observed in 1943. In the open field (not annotated) east of this industrial facility, there is a small impoundment containing standing liquid, the north-south oriented rail spur, and three areas of light-toned material. Probable debris is noted adjacent to one of the three areas of light-toned material where construction activity (not annotated) is also observed. East of the north-south oriented rail spur are the electrical substation and the large vertical storage tank. Standing liquid, possible stains, debris, and possible solid waste are observed

adjacent to buildings (not annotated) constructed since 1947. Several residences remain along Stewart Avenue. To the north, between Stewart Avenue and the unnamed road, several new buildings (not annotated) have been constructed since 1947. A smokestack remains visible at the large building located at the terminus of the U-shaped rail spur. Adjacent to this building, possible debris and three open storage areas comprised of large containers, crates (CR), probable crates/containers, dark-toned objects, and linear (LIN) - shaped objects are noted. A probable smokestack appears attached to one of the smaller buildings (not annotated) immediately to the west. Also visible to the west are a small possible excavation, dark-toned mounded material, mounded material covered with possible vegetation, and a circular-shaped pit containing cylindrical-shaped object. Between the building and the rail spur to the east, a small excavation containing standing liquid is observed. Adjacent to the excavation is light-toned mounded material. Just to the north are uniform light-toned mounded material and an area of disturbed ground where multi-toned material is also noted.

Most of the new development within Building Complex-3 has occurred east of the rail spur, near to where a square-shaped dry impoundment is under construction. Uniform, light-toned mounded material (not annotated) is located on the south side of the future impoundment. Farther east there is a small pit and two new buildings (not annotated) located on a new fill area composed of uniform light-toned material. Proximal to other new buildings (not annotated) constructed since 1947, there are uniform light- and dark-toned mounded material, dark-toned material, multi-toned material, a possible trench containing standing liquid, two possible horizontal storage tanks, possible debris, and a small open storage area in which containers and crates are visible.

Northwest of the site, between the railroad line and Old Country Road, possible stains, dark-toned mounded material, debris, and possible solid waste are noted at the light-industrial facility (not annotated). To the east there are several impoundments containing standing liquid and two vertical storage tanks. South of the site, proximal to the railroad, a total of 13 vertical storage tanks and 28 horizontal storage tanks are observed. In addition, an area comprised of stains, debris, probable solid waste, containers, and crates remains visible.



INTERPRETATION CODE

- SITE BOUNDARY
- DRAINAGE
- INDETERMINATE DRAINAGE
- VEHICLE ACCESS
- RAILROAD
- EXCAVATION/PIT (EXTENSIVE)
- MOUNDED MATERIAL (EXTENSIVE)

AG	AGRICULTURAL
AP	AIRPLANES
AR	ACCESS ROAD
BC	BUILDING COMPLEX
BF	BUILDING FOUNDATION
CA	CLEARED AREA
CIR	CIRCULAR
CONT	CONTAINER(S)
CR	CRATE(S)
CYL	CYLINDRICAL
DB	DEBRIS
DEP	DEPRESSION
DG	DISTURBED GROUND
DR	DRUMS
DT	DARK-TONED
ES	ELECTRICAL SUBSTATION
EX	EXCAVATION
FA	FILL AREA
GR	GRADED AREA
GS	GROUND SCAR
HE	HEAVY EQUIPMENT
HT	HORIZONTAL TANK
IM	IMPOUNDMANT
LIN	LINEAR
LT	LIGHT-TONED
M	MATERIAL
MM	MOUNDED MATERIAL
MT	MEDIUM-TONED
OBJ	OBJECT
OF	OUTFALL
OS	OPEN STORAGE AREA
OVHD	OVERHEAD
PV	PARTIALLY VEGETATED
RB	RUBBLE
RECT	RECTANGULAR
RES	RESIDENCE(S)
SL	STANDING LIQUID
SS	SMOKESTACK
ST	STAIN
SW	SOLID WASTE
SWDA	SOLID WASTE DISPOSAL AREA
TKS	TANKS
TR	TRENCH
UO	UNIDENTIFIED OBJECT
VEG	VEGETATION
VEH	VEHICLE
VT	VERTICAL TANK

Figure 7. Old Roosevelt Field Contaminated Groundwater Area, February 10, 1952. Approximate scale 1:11,105.

JUNE 24, 1959 (FIGURE 8)

Due to large-scale construction activity since 1952, which included the building of Meadowbrook State Parkway, the areal extent and limits of all three building complexes have significantly changed since 1952 and collectively comprise the entire Old Roosevelt Field Contaminated Groundwater Area. Building Complex-1 encompasses the northeast part of the site east of the Parkway, Building Complex-2 the northwest part of the site basically west of the Parkway, and Building Complex-3 the entire southern part of the site basically south of the unnamed road. These new complex boundaries will remain consistent throughout the remainder of the analysis period.

Since 1952 numerous buildings and parking areas (features are not annotated) have been constructed within Building Complex-1. Dark-toned objects are noted near dark-toned material in the northwestern portion of this building complex. To the east there are a retention basin containing standing liquid, two open storage areas each comprised of crates and possible stains, a possible vertical storage tank, and a small area where possible stains and possible debris are noted. Farther south several ground scars, uniform light-toned mounded material, and a large east-west oriented mound covered with vegetation are noted. The scars are likely the result of the new construction activity.

In Building Complex-2 all buildings previously associated with this complex have been removed. In the western portion of this complex, there are ground scars and a large retention basin filled with standing liquid. Between these features is a broad area of undeveloped land comprised of disturbed ground and ground scars. A probable trench, possible debris and large containers are visible within this area. A massive structure (probable shopping mall; not annotated) has been constructed in the central portion of the complex. In the southeastern portion of this complex, two retention basins have been constructed, the larger of which contains pockets of standing liquid while the smaller one is dry.

North of Stewart Avenue in the western portion of Building Complex-3, saturated material is observed in the northern end of the retention basin. To the east there are approximately ten residences, an expansive fill area composed of multi-toned material, a patch of disturbed ground and ground scars

where dark-toned mounded material is noted, and an open storage area. Crates and containers are visible within the open storage area, which appears associated with a large building (not annotated) with a smokestack in the north-central portion of this complex. North of the open storage area is a small building (not annotated) where a possible smokestack is noted. On the north side of these two buildings, there are two possible impoundments in which no liquid is observed, and possible stained ground. East of the large building are the small impoundment containing standing liquid seen on the 1952 photograph and an open storage area. Within this open storage area, dark-toned objects, probable stains, possible debris, and three vertical storage tanks are noted. East of the rail spur, there are stains, a small impoundment containing standing liquid, light- and medium-toned material, a depression containing dark-toned material, and ground scars.

South of Stewart Avenue, the light-industrial facility (not annotated) with a smokestack remains in the western portion of Building Complex-3. South of the smokestack, a ground scar and a possible horizontal storage tank are noted. Between the east-west oriented rail spur and the main railroad line is possible debris. East of the industrial facility, there are ground scars and two impoundments containing standing liquid. In 1952 only one impoundment was observed at this location. Farther east the electrical substation and the large vertical storage tank remain. In addition, nearby are two patches of stained ground, one where debris is noted, and another area of widely scattered staining. A single residence remains along Stewart Avenue. East of the large U-shaped rail spur, a possible horizontal storage tank, dark-toned material, and a small open storage area containing crates are noted. Near the open storage area is a small pile of debris.

Immediately northwest of the site, at a light-industrial facility (not annotated) there are several impoundments containing standing liquid and two vertical storage tanks. South of the site, proximal to the railroad, there are a total of 13 vertical storage tanks and 34 horizontal storage tanks. In addition, solid waste, stains, and debris are visible.

INTERPRETATION CODE

	SITE BOUNDARY
	DRAINAGE
	INDETERMINATE DRAINAGE
	VEHICLE ACCESS
	RAILROAD
	EXCAVATION/PIT (EXTENSIVE)
	MOUNDED MATERIAL (EXTENSIVE)
AG	AGRICULTURAL
AP	AIRPLANES
AR	ACCESS ROAD
BC	BUILDING COMPLEX
BF	BUILDING FOUNDATION
CA	CLEARED AREA
CIR	CIRCULAR
CONT	CONTAINER(S)
CR	CRATE(S)
CYL	CYLINDRICAL
DB	DEBRIS
DEP	DEPRESSION
DG	DISTURBED GROUND
DR	DRUMS
DT	DARK-TONED
ES	ELECTRICAL SUBSTATION
EX	EXCAVATION
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HE	HEAVY EQUIPMENT
HT	HORIZONTAL TANK
IM	IMPOUNDMANT
LIN	LINEAR
LT	LIGHT-TONED
M	MATERIAL
MM	MOUNDED MATERIAL
MT	MEDIUM-TONED
OBJ	OBJECT
OF	OUTFALL
OS	OPEN STORAGE AREA
OVHD	OVERHEAD
PV	PARTIALLY VEGETATED
RB	RUBBLE
RECT	RECTANGULAR
RES	RESIDENCE(S)
SL	STANDING LIQUID
SS	SMOKESTACK
ST	STAIN
SW	SOLID WASTE
SWDA	SOLID WASTE DISPOSAL AREA
TKS	TANKS
TR	TRENCH
UO	UNIDENTIFIED OBJECT
VEG	VEGETATION
VEH	VEHICLE
VT	VERTICAL TANK

Figure 8. Old Roosevelt Field Contaminated Groundwater Area, June 24, 1959. Approximate scale 1:11,105.

MARCH 29, 1976 (FIGURE 9)

Full stereoscopic coverage was not available for the northern portion of the Old Roosevelt Field Contaminated Groundwater Area. Therefore, a detailed analysis could not be performed. In addition, this image is a mosaic comprised of two individual photographs acquired on the same day.

In the northern portion of Building Complex-1, near Meadowbrook State Parkway, possible drums (DR) and stains are observed along the southwest side of a building (not annotated). To the northeast there is an open storage area comprised of numerous crates, containers, cylindrical-shaped objects, debris, and possible stains. Near the eastern site boundary, a ground scar, several possible crates, and a small area consisting of light- and dark-toned material are noted. In the west-central portion of this building complex, scattered debris and possible solid waste are observed adjacent to a building (not annotated). In the southern portion of the complex, a vertical storage tank, a small pile of probable debris, and several crates are discerned.

A gas station (first identified on the 1962 photographs; see References section) is noted in the northern portion of Building Complex-2. Land in the extreme southwestern portion of the complex remains undeveloped; however, this area continues to be active. Several trenches are visible, the southernmost of which is being utilized as a possible solid waste disposal area. An area comprised of debris, rubble, and patches of dark-toned material, indicating possible liquid deposition, is noted near Clinton Road. Also visible are possible solid waste, a small pile of debris, ground scars, light-toned material, light-toned mounded material, mounded material covered with vegetation, and the containers first noted on the 1959 photograph. Two side-by-side, east-west oriented retention basins are now visible. The large retention basin seen in this location on previous photographs was drained by 1966 (see References section) at which point an east-west oriented berm (not annotated) was constructed in the middle of the basin to separate it into northern and southern halves. Both of these retention basins now contain standing liquid, as do the two retention basins in the southeast corner of this building complex.

North of Stewart Avenue in the western portion of Building Complex-3, there are two small groupings of residences between which is a dry retention basin. To the east there are a small stain, debris, and the large building (not annotated) with a smokestack noted on previous photographs. Immediately west of this building, there is a small building (not annotated) and a probable smokestack. Adjacent to the south side of this small building, debris and possible solid waste are observed, and an impoundment containing standing liquid is visible along the north side of the building. A second possible impoundment seen on the 1959 photograph is no longer evident and appears to have been filled. Proximal to the east side of the large building, there is a horizontal storage tank, patch of stained ground, large swath of debris, and an impoundment containing standing liquid. In addition, two small open storage areas are also visible. Collectively, these open storage areas are comprised of containers, probable containers or crates, and stains. Farther east, between Stewart Avenue and the unnamed road, solid waste, debris, and crates are visible. To the north, between the unnamed road and Meadowbrook State Parkway, solid waste, debris, stains, light-toned material, and a possible horizontal storage tank are evident.

South of Stewart Avenue, the light-industrial facility (not annotated) with a smokestack remains in the western portion of Building Complex-3. A small open storage area comprised of possible containers is noted alongside the facility, as is a probable stain. East of the facility, there are two mounds of material covered with vegetation, possible and probable debris, dark-toned objects, and a dry impoundment. An outfall (OF), oriented toward the industrial facility, is observed within the impoundment. Farther east, near the electrical substation, there are light-toned mounded material, several storage tanks (TKS) connected by overhead (OVHD) pipelines, a pile of possible solid waste, a stain, and several crates. The large vertical storage tank seen in previous photographs has been removed. Farther east solid waste, debris, and stains are apparent. Near the easternmost rail spur (formerly identified as the U-shaped rail spur, much of which has been removed), one of a grouping of four buildings (not annotated) has been demolished. Piles of debris and rubble are scattered throughout this portion of the building complex.

Immediately to the northwest of the site, there are two vertical storage tanks, solid waste, debris, and stains at a light-industrial facility (not annotated). South of the site, proximal to the railroad, there are a total of 13 vertical storage tanks and 30 horizontal storage tanks, as well as a large collection of storage tanks, drums, stains, solid waste, possible solid waste, rubble, and debris. One area of staining may be the result of leakage.

INTERPRETATION CODE

———	SITE BOUNDARY
←— —	DRAINAGE
—↔—	INDETERMINATE DRAINAGE
====	VEHICLE ACCESS
+++++	RAILROAD
	EXCAVATION/PIT (EXTENSIVE)
	MOUNDED MATERIAL (EXTENSIVE)
AG	AGRICULTURAL
AP	AIRPLANES
AR	ACCESS ROAD
BC	BUILDING COMPLEX
BF	BUILDING FOUNDATION
CA	CLEARED AREA
CIR	CIRCULAR
CONT	CONTAINER(S)
CR	CRATE(S)
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DB	DEBRIS
DEP	DEPRESSION
DG	DISTURBED GROUND
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EX	EXCAVATION
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VEH	VEHICLE
VT	VERTICAL TANK

Figure 9. Old Roosevelt Field Contaminated Groundwater Area, March 29, 1976. Approximate scale 1:11,140.

APRIL 4, 1994 (FIGURE 10)

The available photographs acquired for this year are small scale; thus, a detailed analysis could not be performed. The following discussion is relatively general in context, as many of the features seen on previous photographs, if present, could not be discerned.

Within Building Complex-1, disturbed ground, light-toned mounded material, and light-toned material are observed.

A probable gas station remains noted in the northern portion of Building Complex-2. Land in the extreme southwestern part of the complex remains undeveloped and is covered with unkempt vegetation (not annotated). A patch of debris is visible at the terminus of an access road (not annotated). Light-toned material, light-toned mounded material, mounded material covered with vegetation, and light-toned objects are also noted in this portion of the building complex. Only one of the two retention basins on the 1976 photograph in this portion of the complex is filled with standing liquid. In the southeast portion of this complex, the two retention basins, also noted in 1976, continue to hold standing liquid.

North of Stewart Avenue, in the western portion of Building Complex-3, the two small groupings of residences remain, as does the retention basin containing standing liquid situated between the residences. Immediately south of the retention basin, there is a small excavation and a pile of light-toned material alongside the school. To the east, proximal to Meadowbrook State Parkway, there are a possible stain and an open storage area comprised of probable crates.

South of Stewart Avenue, in the western portion of Building Complex-3, the light-industrial facility (not annotated) with a smokestack remains. An open storage area consisting of light- and dark-toned objects is visible just east of this facility. Farther east is the electrical substation and a grouping of overhead pipelines connecting possible tanks.

Contrary to all previous analysis years, no environmentally significant activity is observed northwest of the site. South of the site, proximal to the railroad, there are six horizontal storage tanks and one possible horizontal storage tank.

INTERPRETATION CODE

	SITE BOUNDARY
	DRAINAGE
	INDETERMINATE DRAINAGE
	VEHICLE ACCESS
	RAILROAD
	EXCAVATION/PIT (EXTENSIVE)
	MOUNDED MATERIAL (EXTENSIVE)
AG	AGRICULTURAL
AP	AIRPLANES
AR	ACCESS ROAD
BC	BUILDING COMPLEX
BF	BUILDING FOUNDATION
CA	CLEARED AREA
CIR	CIRCULAR
CONT	CONTAINER(S)
CR	CRATE(S)
CYL	CYLINDRICAL
DB	DEBRIS
DEP	DEPRESSION
DG	DISTURBED GROUND
DR	DRUMS
DT	DARK-TONED
ES	ELECTRICAL SUBSTATION
EX	EXCAVATION
FA	FILL AREA
GR	GRADED AREA
GS	GROUND SCAR
HE	HEAVY EQUIPMENT
HT	HORIZONTAL TANK
IM	IMPOUNDMANT
LIN	LINEAR
LT	LIGHT-TONED
M	MATERIAL
MM	MOUNDED MATERIAL
MT	MEDIUM-TONED
OBJ	OBJECT
OF	OUTFALL
OS	OPEN STORAGE AREA
OVHD	OVERHEAD
PV	PARTIALLY VEGETATED
RB	RUBBLE
RECT	RECTANGULAR
RES	RESIDENCE(S)
SL	STANDING LIQUID
SS	SMOKESTACK
ST	STAIN
SW	SOLID WASTE
SWDA	SOLID WASTE DISPOSAL AREA
TKS	TANKS
TR	TRENCH
UO	UNIDENTIFIED OBJECT
VEG	VEGETATION
VEH	VEHICLE
VT	VERTICAL TANK

Figure 10. Old Roosevelt Field Contaminated Groundwater Area, April 4, 1994. Approximate scale 1:10,930.

GLOSSARY

Access Road (AR) - A paved or unpaved route of vehicular access.

Cleared Area (CA) - An area from which man has removed trees, shrubs, or other natural vegetative cover.

Container (CONT) - Any portable device in which material is stored, transported, handled, or disposed.

Dark- (DT), Medium- (MT), or Light-Toned (LT) - Tones of features in question are compared with the darkest and lightest tones of gray (if using B&W photography) on the print.

Debris (DB) - The remains of anything that can be identified as being broken down, destroyed, demolished, or dismantled.

Disturbed Ground (DG) - A rough area where the ground surface has been dug up or overturned.

Drums (DR) - Metal cylinders used for the storage, transportation, or disposal of materials.

Excavation Area (EX) - An area where earth or other material is being removed in order to alter the ground level (e.g., building construction).

Fill Area (FA) - An area where material is being deposited to fill a depression; or area where materials have been added, altering the elevation of the ground surface.

Graded Area (GR) - An area where the surface of the ground has been leveled or altered by a vehicle pulling or pushing a wide blade.

Ground Scar (GS) - An area of bare soil, apparently the result of human activity.

Impoundment (IM) - A liquid containment area that appears to be related to activity on a site but does not appear to be used for waste storage, disposal and/or treatment.

Material (M) - Raw or waste materials on or in the vicinity of the site.

Mounded Material (MM) - Piles of raw or waste materials on or in the vicinity of the site.

Outfall (OF) - The place where an effluent is discharged into the environment.

Open Storage Area (OS) - An area of open-air (outdoor) storage of containerized, raw or waste materials, within industrial or manufacturing sites.

Pit - A steep-sided hole in the ground surface.

Rubble (RB) - Broken bits and pieces of anything that has been demolished (usually associated with brick or stone).

Solid Waste (SW) - Any garbage, refuse, or sludge from a waste treatment, water supply treatment plant, or air pollution control facility, and other discarded material, including solid or semi-solid material resulting from industrial, commercial, mining, and agricultural operations, and from community activities; does not include solid or dissolved material in domestic sewage, or solid or dissolved materials in irrigation return flows or industrial discharges.

Solid Waste Disposal Area (SWDA) - An area where waste materials are discarded.

Stain (ST) - A residue or discoloration resulting from a spill, discharge, or removed/dispersed materials.

Standing Liquid (SL) - A small, shallow, temporary collection of liquid, not necessarily waste. Not to include liquid contained in impoundments, trenches, pits, etc.

Tanks - Vertical tanks (VT), horizontal tanks (HT), pressure tanks (PT), tank farms, and solid waste management units. A large receptacle, container, or structure for holding liquid or gas.

Trench (TR) - A long, narrow excavation unrelated to drainage.

REFERENCES

MAPS

Source[a]	Figure	Name	Scale	Date
USGS	1	United States	1:2,500,000	1972
USGS	2	Freeport, NY	1:24,000	1994
USGS	2	Hicksville, NY	1:24,000	1979
USGS	2	Lynbrook, NY	1:24,000	1969
USGS	2	Sea Cliff, NY	1:24,000	1979

COLLATERAL INFORMATION

EPA. 2004. Collateral data and site map supplied by EPA Region 2 as attachment to Remote Sensing Services Request Form.

LMS (Lockheed Martin Services). 2004. Master Quality Assurance Project Plan. Prepared for EPA Environmental Sciences Division. Contract 68-D-00-267. Las Vegas, Nevada.

AERIAL PHOTOGRAPHS

Photo source[a]	Figure[b]	Date of acquisition	Original scale	Film type[c]	Mission I.D.	Source frame #	EPIC ID #
KVT	3	08-03-38	1:20,000	B&W	BTQ	16,17, 25,26, 27	67198,67199 67200,96349 96350
KVT	4	11-14-40	1:16,000	B&W	UNK	177,178	67204,67203
KVT	5	06-23-43	1:22,000	B&W	UNK	8,9, 37-39	67212,67213 67214-67216
KVT	-	08-14-44	1:20,000	B&W	4M	60,58, 57,59, 1	67217,67218 67219,67220 67221
KVT	-	07-17-46	1:17,000	B&W	311RW-M881	17,18	67222,67223
KVT	6	09-01-47	1:20,000	B&W	BTQ	25-27	67224-67226
KVT	-	11-11-51	1:40,000	B&W	VV18PL	10,14	67227,67228
KVT	7	02-10-52	UNK	B&W	28 SRW	13,14, 15	68188,68190 68192
USGS	-	12-02-53	1:20,000	B&W	GS-VBV	11-13	66837-66839
NOS	8	06-24-59	1:30,000	B&W	UNK	6204-6206	103699-103701
AVPT	-	03-18-62	1:18,000	B&W	1194	1046-1048	96346-96348
USGS	-	03-08-66	1:20,000	B&W	GS-SWAX	19-21	103798-103800
EPA	9	03-29-76	1:12,000	B&W	67075	493,494, 528,529	18754,18755 18760,18761
AGC	-	04-06-80	1:12,000	B&W	8093	1859,1860, 1891,1892	18756,18757 18758,18759
EPA	-	04-03-84	1:12,000	CC	84836	300,301	18780,18785
USGS	-	03-06-85	1:58,000	CIR	407204	58,59	100721,100722
USDA	10	04-04-94	1:40,000	CIR	NAPP	170,171	100723,100724
USGS	-	04-11-02	1:15,000	CC	NYC	133,134	103796,103797

[a]AGC AeroGraphics Corp., Bohemia, New York
AVPT Aerial Viewpoint, Inc., Spring, Texas
EPA U.S. Environmental Protection Agency, Environmental Sciences Division, Las Vegas, Nevada
KVT King Visual Technology, Hyattsville, Maryland
NOS National Ocean Service, Coast and Geodetic Survey, Washington, D.C.
USDA U.S. Department of Agriculture, Salt Lake City, Utah
USGS U.S. Department of Interior, U.S. Geological Survey, Washington, D.C.

[b]Photographs listed with no figure number were analyzed, but not placed in this report.

[c]B&W Black-and-white
CC Conventional color
CIR Color infrared