US Army Corps of Engineers

Defense Environmental Restoration Program
For
Formerly Used Defense Sites

ABBREVIATED PRELIMINARY ASSESSMENT

Floyd Bennett Field

Brooklyn (Jamaica Bay), NY

FUDS Property Number – C02NY0020

DRAFT-FINAL REPORT
September 2015

Prepared by
U.S. Army Corps of Engineers, St. Louis District
for the
U.S. Army Corps of Engineers, New England and NewYork Districts

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EXECUTIVE SUMMARY

The U.S. Army Corps of Engineers (USACE) administers the Defense Environmental Restoration Program (DERP) Formerly Used Defense Site (FUDS) program. The St. Louis District of the Corps of Engineers prepared this Abbreviated Preliminary Assessment (APA) for **Property No. C02NY002001, Floyd Bennett Field**, in support of DERP-FUDS. St. Louis District completed this effort in coordination with the USACE New York and New England Districts and the U.S. Army Engineering and Support Center, Huntsville (USAESCH) Environmental & Munitions Center of Expertise (EM-CX).

This APA compiles information obtained through historical research at various archives and records holding facilities. The investigation was primarily a textual, cartographic and photographic research and analysis effort. It also makes use of property visits and interviews to gather information concerning the property. The research directed efforts towards determining presence of hazardous substance as a result of previous munitions related use, storage, and/or disposal. The research places emphasis on establishing the types, quantities and areas of munitions and explosives of concern (MEC) and chemical warfare (CW) activities. This process obtains information for use in developing recommendations for further action at the former Floyd Bennett Field.

The **Floyd Bennett Field** FUDS property consists of approximately 1,192 acres near Brooklyn (Jamaica Bay), NY, located in Kings County. The Navy used Floyd Bennett Field from 1931 through 1971. From 1931 to 1942 only certain facilities at Floyd Bennett Field were used as a Naval Reserve Aviation Base. The Navy acquired the entire Floyd Bennett Field and established the Naval Air Station New York (NAS NY) in 1942. The mission of the NAS NY was to maintain and operate a base for naval aircraft units, to provide hangar storage and operation facilities for land and seaplanes, and to conduct overhaul and repair. The Air Force used of portions of the land and facilities located at NAS NY from October 1949 to mid-1955. The Army operated a 90mm anti-aircraft gun battery at Floyd Bennett Field between 1952 and 1958, but the site is on property currently controlled by the Marine Corps and is not FUDS Eligible. The Navy transferred the majority of the Floyd Bennett Field property to the National Park Service and the U.S. Coast Guard by 1975, retaining two tracts after 1987. The majority of one of the retained tracts remains under the control of the Marine Corps.

Munitions related features of the former Floyd Bennett Field included indoor and outdoor small arms ranges, a gun test backstop, and multiple munitions storage facilities for small arms, bombs, warheads, pyrotechnics, bulk explosives, fuzes, and smoke drums. Although numerous munitions were stored at Floyd Bennett Field, only small arms ammunition is known or suspected to have been used or present at any potential FUDS eligible munitions-related Area(s) of Interest (AOIs) at the FUDS property.

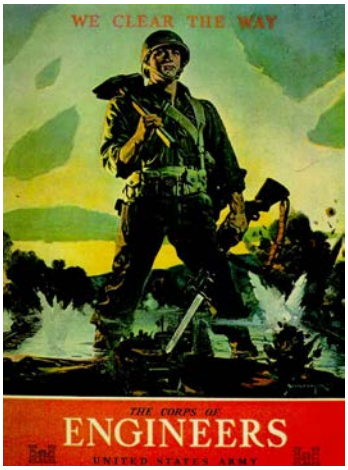
Analysis of the information gathered during this investigation identified one munitions-related AOI consisting of small arms ranges at the former Floyd Bennett Field:

TABLE ES.1
Munitions-Related Areas of Interest

Potential AOI Ranges	Munitions Related Function	Hazard Potential
1940s Gun Test Backstop (i.e. Firing-In-Butt or Stationary Aircraft Small Arms Range)	Firing small arms from aircraft mounted guns	**No MEC Hazard Suspected.** Only small arms used based on historical documents. No physical evidence remains. Area has been paved over. **Potential MC Hazard** from small arms ammunition. No physical evidence remains. Firing area has been paved over.
1940s Small Arms Ranges (Pistol and Skeet Ranges)	Training with small arms ammunition	**No MEC Hazard Suspected.** Only small arms used based on historical documents. The site visit did not locate any related debris or other evidence. **Potential MC Hazard** from small arms ammunition. No physical evidence remains. Portions of area have been paved over; remainder undeveloped.
1950s Small Arms Ranges (Pistol and Skeet Ranges)	Training with small arms ammunition	**No MEC Hazard Suspected.** Only small arms used based on historical documents. The site visit did not locate any related debris or other evidence. **Potential MC Hazard** from small arms ammunition. No physical evidence remains. Portions of area have been paved over; remainder undeveloped.

The total acreage of the overlapping ranges comprising the munitions-related AOI is 1,458 acres.

ACKNOWLEDGEMENTS



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1 INTRODUCTION

1.1 AUTHORITY

Under the authority of the Defense Environmental Restoration Program (DERP) [10 USC §§ 2701 et seq.], and its policies and procedures relating to Formerly Used Defense Sites (DERP-FUDS), including Department of Defense (DoD) Management Guidance for the DERP dated 9 March 2012, and Engineering Regulation 200-3-1, Environmental Quality, Formerly Used Defense Sites (FUDS) Program Policy, the U.S. Army Corps of Engineers (USACE) St. Louis District investigated the Floyd Bennett Field in Kings County, NY. Completion of this investigation on the former military property supports several Federal laws and rules, DoD Directives and Standards, and Army Regulations as outlined in the subsequent sub-paragraphs.

1.1.1 Laws

In 1980, Congress enacted the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), commonly known as Superfund, to respond to threats posed by historic releases of hazardous substances into the environment. CERCLA was amended in 1986 by the Superfund Amendments and Reauthorization Act (SARA), which established the process for undertakings remedial actions at inactive waste sites containing hazardous substances, as well as reporting requirements for releases of hazardous substances. SARA expanded the provisions of CERCLA and added major new authorities. These amendments included the addition of Section 120, Federal Facilities and Section 121, Cleanup Standards. Section 120 requires departments and agencies of the federal government to comply with the provisions of CERCLA as amended by SARA. Section 121 establishes the procedures for the selection of remedial actions and the determination of the degree of remediation.

In 1986, Congress established the DERP at 10 USC §§ 2701 et seq. This program directed the Secretary of Defense to carry out a program of environmental restoration at "Each facility or site which was under the jurisdiction of the Secretary and owned by, leased to, or otherwise possessed by the United States at the time of actions leading to contamination by hazardous substances." Executive Order 12580 (EO 12580, 23 January 1987), Superfund Implementation, delegated the DoD to be the lead agency and response authority for releases or threatened releases of hazardous substances, pollutants and contaminants from any facility or vessel under the jurisdiction, custody, or control of DoD, subject to Sections 120 and 121 of SARA. In March 1990, the U.S. Environmental Protection Agency issued a revised National Oil and Hazardous Substances Pollution Contingency Plan (NCP). Under 40 Code of Federal Regulations (CFR) §300.120, DoD is identified as the lead agency and response authority for incidents involving DoD military weapons and munitions under the jurisdiction, custody and control of DoD.

1.1.2 Regulations and Guidance

Since the beginning of DERP, the U.S. Army Corps of Engineers has acted as the agency responsible for environmental restoration at FUDS. The U.S. Army Corps of Engineers, St. Louis District, began conducting historical research and analysis for environmental site characterization in 1992. This research and analysis was originally captured in Archive Search Reports (ASRs) at FUDS, active DoD installations, and installation transitions under Base Realignment and Closure (BRAC) recommendations. Engineering Regulation 200-3-1, Environmental Quality, Formerly Used Defense Sites (FUDS) Program Policy dated 10 May 2004, dictates requirements of the CERCLA process as outlined in the NCP. As such, previous historical records research and analysis reports are incorporated into Preliminary Assessments (PA), which now include pathway and environmental hazard assessment.[1] The U.S. Army Corps of Engineers, St. Louis District, prepared this Abbreviated PA in accordance with the U.S. Environmental Protection Agency guidance publication, *Improving Site Assessment: Abbreviated Preliminary Assessments*, EPA-540-F-98-037, October 1999.

1.2 SUBJECT

Floyd Bennett Field consisted of approximately 1,305 acres (of which 1,192 acres is considered FUDS Eligible) near Brooklyn (Jamaica Bay), NY, located in Kings County. The Navy used Floyd Bennett Field from 1931 through 1971. From 1931 to 1942 only certain facilities at Floyd Bennett Field were used as a Naval Reserve Aviation Base. The Navy acquired the entire Floyd Bennett Field and established the Naval Air Station New York (NAS NY) in 1942. The mission of the NAS NY was to maintain and operate a base for naval aircraft units, to provide hangar storage and operation facilities for land and seaplanes, and to conduct overhaul and repair. The Air Force requested use of portions of the land and facilities located at NAS NY in October 1949. Revocable permit negotiations for the use of facilities and land began in October 1949 with additional modifications to that permit continuing into mid-1955. The Army operated a 90mm anti-aircraft gun battery at Floyd Bennett Field between 1952 and 1958 but the site is on property currently controlled by the Marine Corps and is not FUDS Eligible. The Navy transferred the majority of the Floyd Bennett Field property to the National Park Service (NPS) and the U.S. Coast Guard by 1975, retaining two tracts until after 1987. One retained tract is approximately 29 acres that the Navy used as a Reserve Detachment. The other retained tract was approximately 84 acres, most of which is still used by the Marine Corps as a recruit training center and the remainder of which was transferred to the NPS after 1987. Plates 1 and 2 in the Report Plates Appendix show the general location of the property and Plates 3, 4, 5, and 6 identify the location of the features of interest.

Munitions and Explosives of Concern (MEC) and chemical warfare (CW) related features of the former airfield included indoor and outdoor small arms ranges, a gun test backstop, and multiple munitions storage facilities for small arms, bombs, warheads,

pyrotechnics, bulk explosives, fuzes, and smoke drums. Although numerous munitions were stored at Floyd Bennett Field, only small arms ammunition is known or suspected to have been used on the property and only small arms ammunition presents any potential FUDS eligible munitions-related hazards at the FUDS property.

1.3 PURPOSE

This APA compiles information obtained through historical research at various archives and records holding facilities. The investigation was primarily a textual, cartographic and photographic research and analysis effort. It also makes use of interviews with individuals associated with the property and its operations, and a visual property visit. No sampling or quantitative field assessment techniques were conducted to gather data. The research directed efforts toward determining presence of hazardous substance as a result of previous DoD use, storage, and/or disposal. This process obtains information for use in developing recommendations for further action at the former Floyd Bennett Field.

1.4 SCOPE

The investigation team focused on potential MEC and/or CWM contamination remaining on the former Floyd Bennett Field. The DERP-FUDS property number is C02NY0020. This report presents the following:

- A review of related property investigations;
- Description and characteristics of the immediate surrounding area, including real estate information, past and present;
- A brief history of Floyd Bennett Field;
- Description of the munitions and/or CW activities identified at the property;
- A map and aerial photography analysis of the property;
- Findings of the visual property visit;
- Evaluation of potential contamination on the property;
- A pathway and environmental hazard assessment; and
- Conclusions regarding Military Munitions Response Program (MMRP) projects and recommendations for further action.

This investigation was limited in that only MMRP issues were assessed. Numerous environmental investigations and studies have been performed at the former Floyd Bennett field as part of the FUDS Program. This report concentrates on supplementing the “data gaps” of the established knowledge base. These factors represent the basis for the evaluation of potential MEC and CWM contamination and associated risks at Floyd Bennett Field.

A description of the sources researched and a detailed listing of records reviewed are presented in Appendix A. A full bibliography of the references (i.e. endnotes) is contained in Appendix B.

2 PREVIOUS INVESTIGATIONS

2.1 CORPS OF ENGINEERS INVESTIGATIONS

2.1.1 Site Visit – Floyd Bennett Field, May 1984

On 23 May 1984, USACE personnel conducted a site visit at Floyd Bennett Field to inspect former Navy buildings and fuel oil tanks. All of the observed buildings were abandoned, but one waste oil tank appeared to still be in use.[2]

2.1.2 Site Survey Report – Storch Engineers, September 1986

In September 1986, Storch Engineers prepared a Site Survey Report of Floyd Bennett Field under contract for the USACE New York District. The report included a site investigation conducted on 24 July 1986. During the site investigation, Storch Engineers personnel observed foundations and light poles, storage bunkers, a POL station and tanks, metal, wooden, and concrete structures, wooden and concrete foundations, light towers, and a steam plant and compressor on the Floyd Bennett Field property.[3]

2.1.3 FDE – Floyd Bennett Field, June 1991

On 7 June 1991, USACE Headquarters approved the Findings and Determination of Eligibility (FDE). While the FDE describes the Floyd Bennett Field FUDS property, the property number on the FDE is C02NY0032, which is for a separate FUDS property, Samson AFB. The FUDS property number for Floyd Bennett Field was changed to C02NY0017 on 20 April 1992 and then to C02NY0020 on 22 June 1992. [4]

The FDE found that the DoD formerly used the land at Floyd Bennett Field between 1931 and 1973 as a Naval Air Station (NAS) and that DoD constructed buildings, underground storage tanks (USTs), above-ground storage tanks (ASTs), drums, containers, and electrical transformers remain on the property.[5]

2.1.4 Project C02NY002001 – C02NY002001C_FLOYD BENNETT FLD (CON/HTRW)

On 1 October 1991, USACE Headquarters authorized Containerized/Hazardous, Toxic, and Radioactive Waste (CON/HTRW) Project C02NY002001 for the removal of 49 USTs, four ASTs, two pumping stations, six transformers, 28 55-gallon drums, and two 1-gallon containers of tricresyl phosphate at Floyd Bennett Field.[6]

Cleaning Up the Environment conducted removal actions at Floyd Bennett Field under contract from USACE between March 1995 and January 1996. The contractor removed a transformer, voltage regulator, 48 USTs and four ASTs, along with their contents and associated piping, from the property. The contractor also removed visually contaminated

soil around nine USTs. Soil sampling indicated the need for further soil excavation and groundwater testing.[7]

In 2011, Cabrera Services, Inc. conducted removal actions at Floyd Bennett Field under contract from USACE. The removal actions included the excavation and removal of 865 feet of fuel oil and jet fuel piping and four 37-foot-diameter AST pads. The contractor removed and disposed of approximately seven drums of impacted soil and identified a fuel release location below a section of pipeline. The contractor also identified two areas with oil and tar contamination near an access road.[8]

2.1.5 Project C02NY002000 – C02NY002002H_FLOYD BENNETT FLD (HTRW)

On 31 January 2001, USACE Headquarters authorized HTRW Project C02NY002002 for the remediation of soil contaminated with polyaromatic hydrocarbons and volatile organic compounds at Floyd Bennett Field.[9]

On 19 January 2010, the USACE New York District and NPS personnel conducted a site visit at Floyd Bennett Field to inspect areas where visually contaminated soil was observed during removal actions. The site visit team inspected areas where USTs and ASTs had been located prior to removal actions.[10]

Personnel from Brown and Caldwell conducted a site investigation at Floyd Bennett Field in December 2010 under a subcontract from Cabrera Services, Inc., the USACE general contractor. The site investigation included soil sampling and the installation of monitoring wells to delineate the extent of soil and groundwater contamination.[11]

2.1.6 Site Visit – Floyd Bennett Field, June 2014

On 26 June 2014, personnel from the USACE New York District and NPS conducted a site visit at Floyd Bennett Field to investigate areas of potential munitions concern. Visited areas included a potential pistol range, skeet and trap shooting houses, and storage buildings. The site visit team did not observe evidence of munitions on the surface of the investigated areas.[12]

2.2 OTHER INVESTIGATIONS

2.2.1 Cultural Resources Inventory – URS Corporation, June 2005

In June 2005, URS Corporation prepared a Cultural Resources Inventory for the NPS to assess potential prehistoric or historic sites that could be impacted during construction work. The report concludes that the upland area of Barren Island has a high potential for both prehistoric and historic archaeological resources.[13]

2.2.2 Environmental Condition of Property Report – Environmental Resources Management, Inc., November 2007

In November 2007, Environmental Resources, Inc. prepared an Environmental Condition of Property Report under contract from the Naval Facilities Engineering Command. The report evaluates environmental conditions at the Marine Corps Reserve Training Center, located on 70 acres within the former Floyd Bennett Field. The evaluation includes a records review, interviews with current and former Floyd Bennett Field employees, aerial photography analysis, a geophysical survey, and soil and groundwater sampling. The evaluation reveals potential fuel pipelines throughout the area and soil and groundwater sampling detected fuel constituents above the New York State Department of Environmental Conservation cleanup values.[14]

2.2.3 Remedial Actions – U.S. Marine Corps, June 2007

In response to the initial findings of the Environmental Condition of Property Report, the U.S. Marine Corps conducted remedial actions at the Marine Corps Reserve Training Center in June 2007. Remedial actions included removal of the former pump house, a 500 gallon UST, and all underground piping, including approximately 500 gallons of jet fuel contained in the piping.[15]

2.2.4 Cultural Landscape Report for Floyd Bennett Field – Olmsted Center for Landscape Preservation, 2009

In 2009, Olmsted Center for Landscape Preservation prepared a Cultural Landscape Report for Floyd Bennett Field under contract from the NPS. The report documents the physical characteristics of the site, evaluates the historical significance of Floyd Bennett Field and its changing historical appearance, and recommends strategies for long-term management of the cultural landscape.[16]

3 PROPERTY DESCRIPTION, ACREAGE AND LAND USE

3.1 LOCATION

The Floyd Bennett Field FUDS property consists of approximately 1,192 acres in Kings County, New York (see Vicinity Map Plate 1). This property lies on the south side of Brooklyn and is bordered by Jamaica Bay, NY. The approximate center of the property is at Latitude N40° 35' 27" (40.59083) Longitude W73° 53' 25" (-73.89027).[17] The property is located within EPA Region 9, New York Congressional District 08 and zip code 11234.

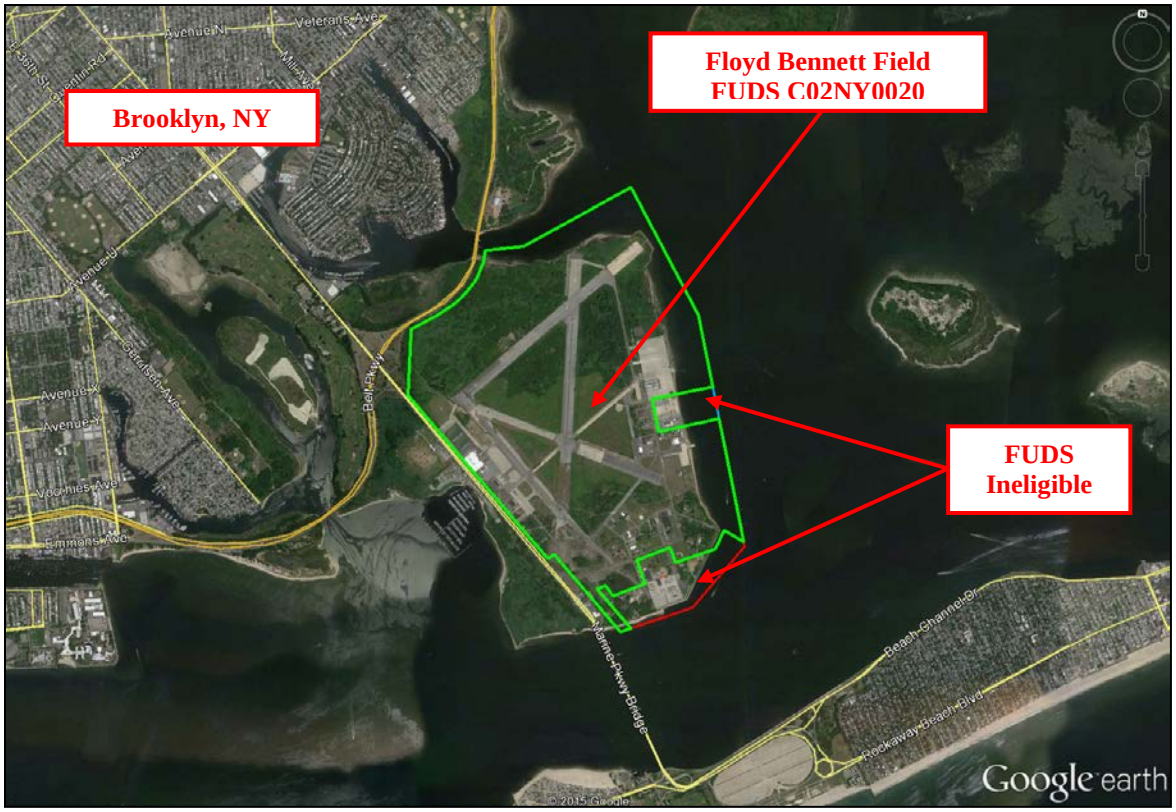


Figure 1 – Floyd Bennett Field Vicinity Map – Google Earth Imagery, 2015

Legend

Confirmed FUDS Property No. C02NY0020 (1,192 Acres)

3.2 FUDS ELIGIBLE PROPERTY

3.2.1 Confirmed FUDS

The eligible FUDS for the former Floyd Bennett Field is approximately1,192 acres (approximately 1,017 acres land and 175 acres water). The Navy used the property and facilities at Floyd Bennett Field between 1931 and 1971. The Navy leased facility space

at Floyd Bennett Field from the City of New York between 1931 and 1941. The Navy purchased 16.4 acres at the south end of Floyd Bennett Field for a seaplane base in April 1940 (see Figure 2).[18]

In December 1941, the Navy Department planned the acquisition of acreage of the remainder of Floyd Bennett Field as follows:[19] No parcel map was found depicting the parcel boundaries or the overall boundary of this acquisition.

1,047 acres	fee land from the City of New York
233.7 acres	fee water from the City of New York
11.6 acres	fee land from the New York Sanitary Utilization Company
8.5 acres	fee water from the New York Sanitary Utilization Company
52.4 acres	fee land from a private owner
19.2 acres	fee water from a private owner
1,372.4 acres	**Total**

This real estate detail (above) does not concur with the acreage number stated in the June 1991 INPR of 1,522 acres.[20] The source of the 1,522 acre total identified in the INPR is unclear and could not be confirmed.

Although there are discrepancies in the reported acreage for Floyd Bennett Field, the boundary of the former naval installation is not in dispute. The Secretary of War approved the boundary of the U.S. Naval Air Station, New York (NAS NY) at Floyd Bennett Field by June 1942 (see following figure).[21] This investigation relied on the GIS calculated acreage within the installation boundary depicted in the following figure as a basis to determine the approximate FUDS eligible acreage. The GIS calculated area within the boundary depicted below is approximately 1,305 acres and it includes the 16.4-acre seaplane base acquired in 1940 which is located at the south end of the installation.[22]

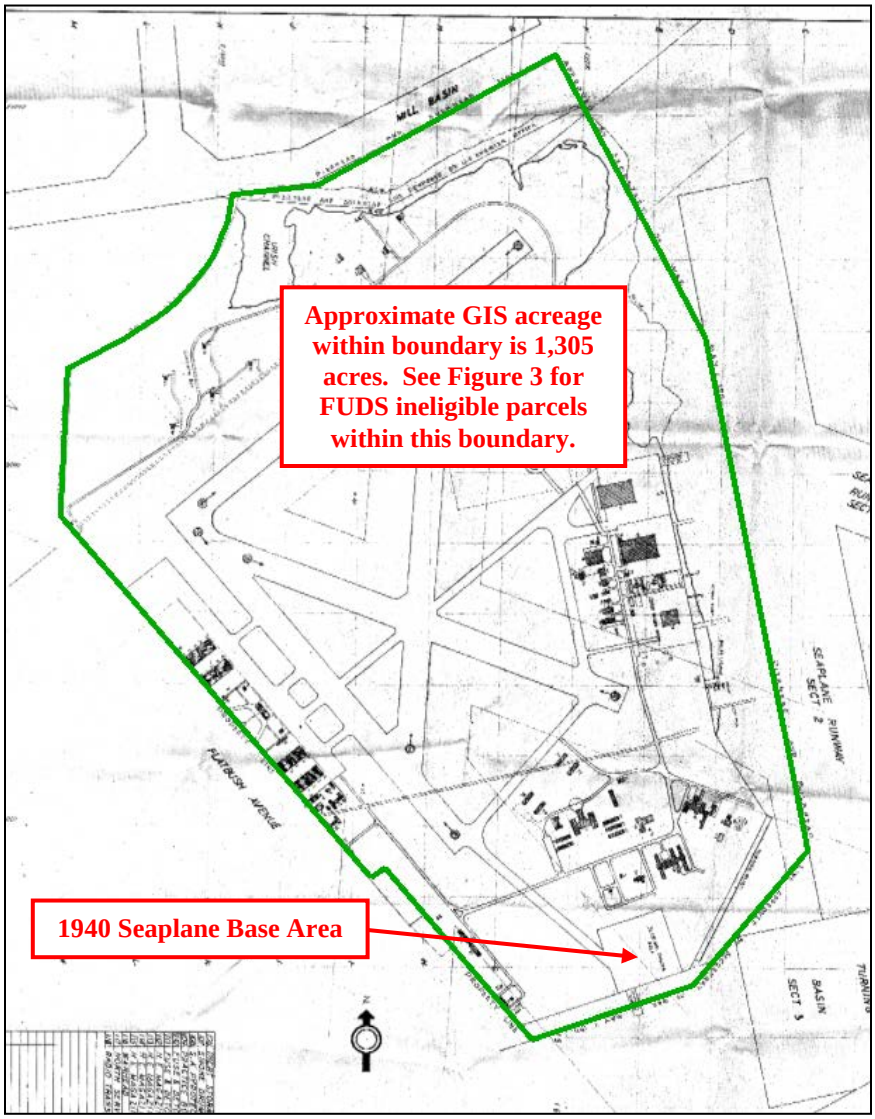


Figure 2 – Naval Air Station at Floyd Bennett Field – June 1942

On 6 March 1970 the Navy announced NAS NY would be closed no later than 30 June 1971. By February 1971, the last military personnel were detached and all buildings were closed except those supporting any remaining government activity. [23] The Navy transferred the majority of the NAS NY property to the U.S. Coast Guard and the NPS in 1973 and 1975, respectively. The Navy retained jurisdiction of two parcels totaling approximately 113 acres until after 17 October 1986, which is the transfer cut-off date for FUDS eligibility (see following figure).[24] Subtraction of the two parcels from the 1,305-acre total (GIS) results in the FUDS eligible acreage of 1,192 acres.

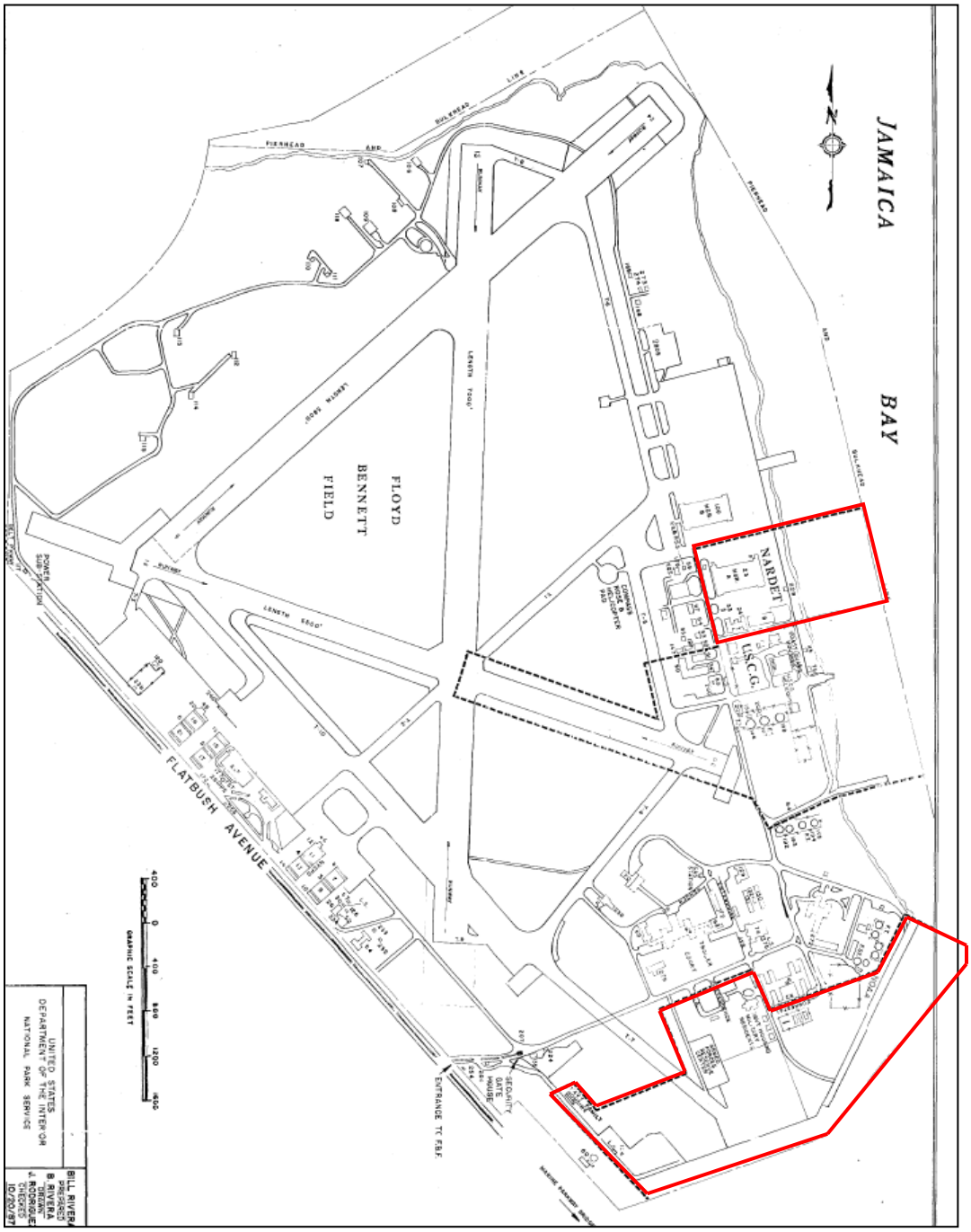


Figure 3 – DoD Retained (FUDS Ineligible) Parcels – October 1987[25]

The Navy used the approximately 29-acre rectangular parcel (see previous figure) as a Naval Air Reserve Detachment facility until at least October 1987. The parcel is currently owned by the NPS. A real estate summary map indicates that the parcel transferred to the NPS on 7 September 1999 but this was not confirmed.[26]

The Navy also retained the approximately 84-acre irregular shaped parcel shown in the figure above until at least October 1987. Parcel transfers culminated in the 1998 transfer

of approximately 72 acres to the Marine Corps who currently uses the site as a reserve training center. The Navy subsequently transferred the remaining 11 acres to the NPS.[27]

Based on a review of available real estate documents, the War Department released Floyd Bennett Field FUDS eligible parcels with no restrictive covenants or land use restrictions.

3.2.2 Additional Areas of Use

The investigation team identified additional areas of potential or undocumented military ownership or land use associated with the former Floyd Bennett Field which are addressed in the following section.

3.2.3 Potential FUDS

The Navy conducted practice bombing at up to four locations in Jamaica Bay outside of the boundary of Floyd Bennett Field with no known or confirmed DoD ownership (see Section 4.2.1.9). These locations are outside the boundary of the approved Floyd Bennett Field and are not eligible to be addressed as munitions related areas of interest (MRAOIs) under this property.

In addition to the potential bombing target locations in Jamaica Bay, in 1954 the Navy acquired approximately 14 acres as a bombing range on Gardiners Island (Property No. C02NY0021), approximately 125 miles to the northeast. Gardiners Island is not FUDS eligible because it remains in the Navy's possession.

3.3 LAND USE AND OWNERSHIP HISTORY

3.3.1 Prior Land Use

Prior to Navy operations, the predominate land use at Floyd Bennett Field was as an airfield, a garbage dump, industrial, some private residences, and undeveloped.

3.3.2 Current Land Use and Ownership

The public has unrestricted access to the former Floyd Bennett Field as it makes up a portion of the Gateway National Recreation Area. Immediately following disposal of the property by the military, the land became national park lands, but small portions have been redeveloped for a mixture of uses including commercial areas, community gardens, and a helicopter launch area. Currently the FUDS is predominantly utilized for recreational purposes including camping, fishing, hiking, biking, baseball/softball, and model airplane flying. Additionally NPS employees and contractors perform work on the FUDS. Portions of the property remain undeveloped.[28]

It is anticipated that future land uses will remain the same.

Records reviewed indicate the current property owner/owners include the following:

National Park Service
Marine Corps Reserve Training Center Brooklyn

The FUDS is a portion of the Gateway National Recreation Area and is surrounded on three sides by water (Jamaica Bay, Rockaway Inlet, Dead Horse Bay and Mill Basin Inlet) which eventually drains into the Atlantic Ocean.[29]

3.3.3 Condition of Facilities Constructed for the Military

The Navy constructed a number of facilities on the FUDS from World War II through the 1970s. Aerial photographs, layout plans, and property maps were utilized to identify the DoD-constructed facilities. The specific condition of the facilities remaining after disposal of the property by the military is unknown.

The scope of the APA is focused on military munitions at the former Floyd Bennett Field. Therefore, the evaluation of Building Demolition/Debris Removal (BD/DR) is not included in this report. Only the facilities pertinent to military munitions are evaluated and they are discussed in Section 4 and Appendix L as applicable.

3.3.4 Population Demographics

The U.S. Census Bureau provided the general county and state demographics of the property.

TABLE 3.3.4
U.S. Census Bureau General County and State Demographics [30]

Census QuickFacts	Kings County	New York
Population July 2013	2,592,149	19,651,127
Population April 2010	2,504,700	19,378,105
Persons under 5 years July 2013	7.4%	6.0%
Persons under 18 years July 2013	23.3%	21.6%
Persons 65 years and over July 2013	12%	14.4%
Female persons July 2013	52.6%	51.5%
White July 2013	49.5%	70.9%
Black or African American July 2013	35.4%	17.5%
American Indian and Alaska Native July 2013	1.0%	1.0%
Asian July 2013	11.7%	80.2%
Native Hawaiian or Other Pacific Islander July 2013	0.1%	0.1%
Two or more races July 2013	2.3%	2.3%
Hispanic or Latino July 2013	19.6%	18.4%
White alone, not Hispanic or Latino July 2013	36.0%	57.2%
Housing units July 2013	1,005,994	8,108,103

TABLE 3.3.4 U.S. Census Bureau General County and State Demographics [30]		
Census QuickFacts	**Kings County**	**New York**
Households 2009-2013	916,025	7,234,743
Persons per household 2009-2013	2.73	2.61
High school graduate or higher, percent of persons age 25+, 2009-2013	78.5%	85.2%
Bachelor's degree or higher, percent of persons age 25+, 2009-2013	30.6%	33.2%
Veterans, 2009-2013	50,234	912,499
Median household income (in 2013 dollars), 2009-2013	$46,085	58,003
Population per square mile, 2010	35,369.1	411.2
Land area in square miles, 2010	70.82	47,126.40

3.4 PHYSICAL PROPERTY CHARACTERISTICS

Information regarding general property geology, hydrogeology, terrain features, and climatic data is presented in this section. Threatened and endangered species, sensitive environments and places of historical significance (e.g., archeological sites, cemeteries, national historical landmarks, etc.) are also identified.

3.4.1 Climatic Data

Climatological data from the National Oceanic and Atmospheric Administration (NOAA) weather station located at LaGuardia Airport, approximately 20 miles northeast of the former Floyd Bennett Field property, provided representative temperature and precipitation data (see following table).

TABLE 3.4.1
National Oceanic and Atmospheric Administration (NOAA)
2000-2015[31]

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Maximum Temperature (degrees F)	59	58	69	84	88	94	97	95	89	81	70	64	99
Minimum Temperature (degrees F)	11	15	21	35	46	55	63	62	53	40	30	20	10
Mean Temperature (degrees F)	33.4	34.8	43.0	53.5	63.1	73.0	78.3	77.3	70.4	59.2	49.0	39.1	54.4
Mean Precipitation (inches)	2.94	2.75	3.92	4.41	3.60	4.98	4.23	4.84	4.21	4.18	3.01	4.21	47.19
Mean Snowfall (inches)	9.2	11.5	3.4	0.5	T	T	T	T	0.0	0.1	0.1	6.4	30.7

The average maximum temperature for LaGuardia Airport, NY, has been recorded as 99°F; the average minimum temperature has been recorded as 10°F. The average total precipitation is documented as 47.19 inches. In the summer, the average maximum temperature has been recorded as 91.6°F with an extreme high of 104°F. In the winter, the average minimum temperature is 22.8° F with a recorded extreme low of 2° F.[32]

3.4.2 Topography

The topography of the former Floyd Bennett Field can generally be described as flat. It has been altered significantly in the 20th century through the dredging and filling of marshes between Barren Island and Brooklyn for the creation of Floyd Bennett Field. [33] The primary vegetation type can generally be described as barren or low grass but perimeter areas have dense vegetation with some trees.

Surface elevations at Floyd Bennett Field range from approximately five to 15 feet above mean sea level (msl), with the lowest elevations located along the waterfront (see following figure). [34]

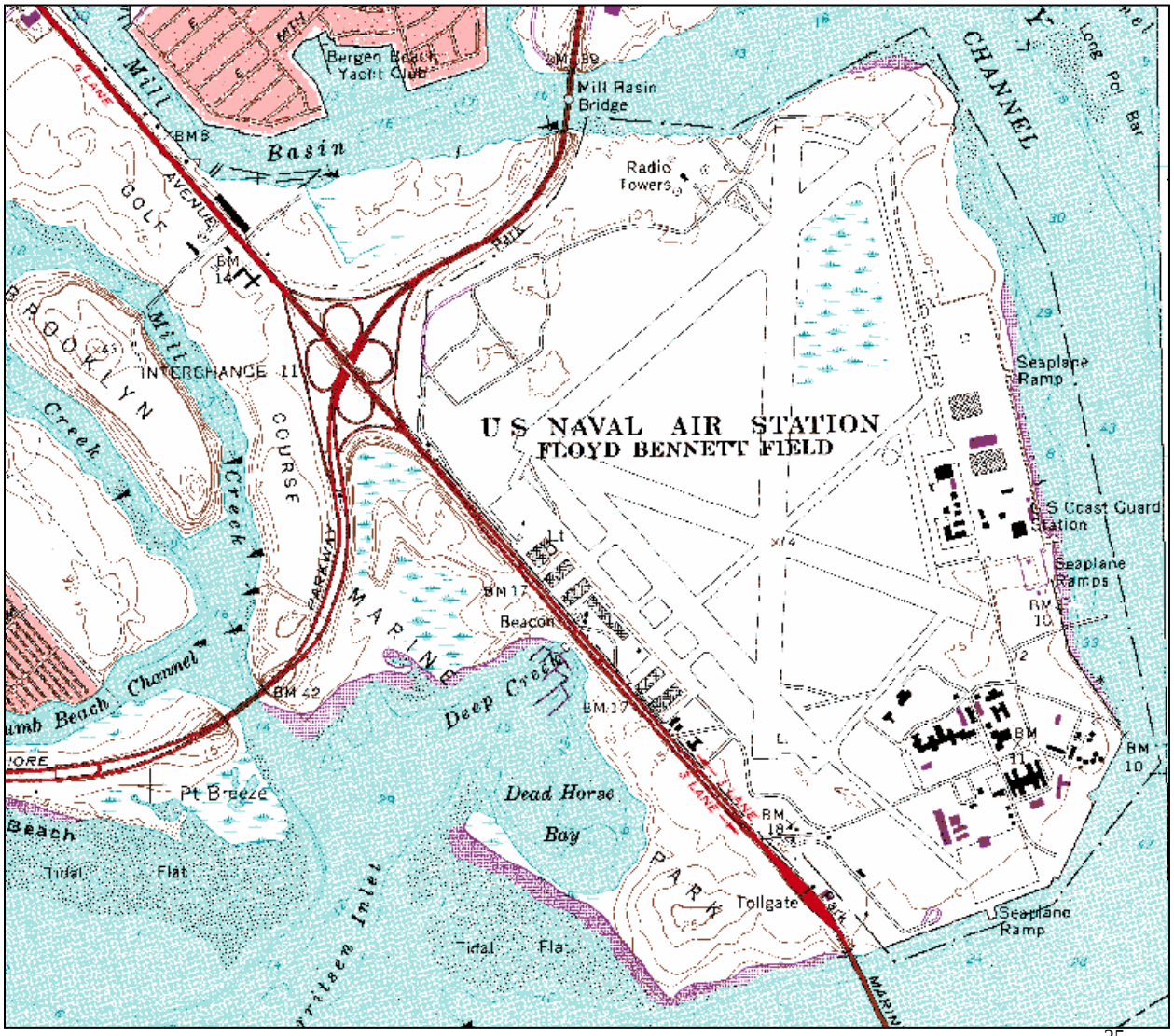


Figure 4 — USGS Topographic Quadrangle of Floyd Bennett Field vicinity 1979[35]

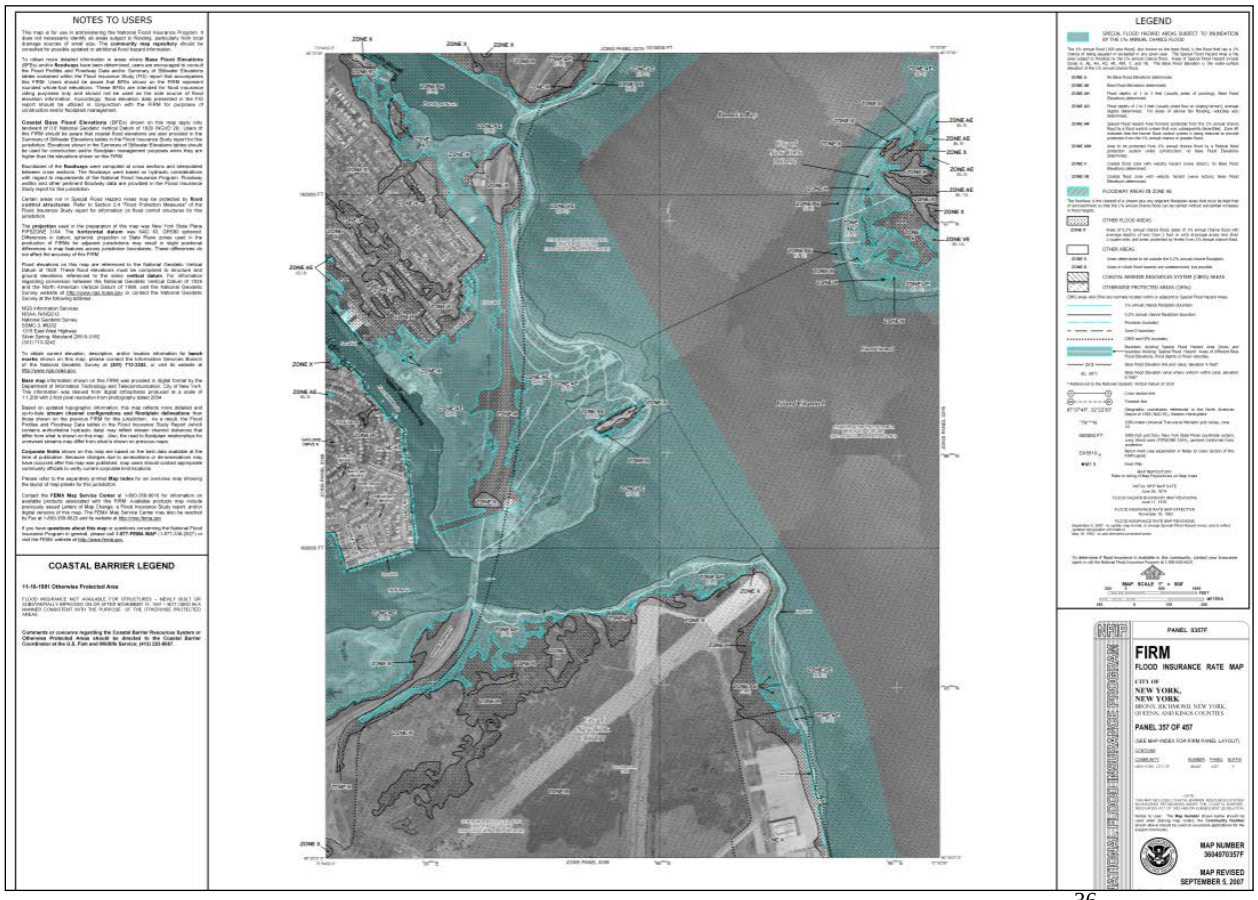


Figure 5 – – NFIP Flood Insurance Rate Map - 5 September 2007[36]

3.4.3 Regional Geology and Physiology

The former Floyd Bennett Field lies within the Atlantic Coastal Plain geologic province. Floyd Bennett Field is directly underlain by Pleistocene dredged fill and miscellaneous dredged fill/urban rubble to a depth of approximately 20 feet. Below the dredged material are natural deposits consisting of organic silt or marsh layers formed in tidal marshes. [37]

Below the organic layer are two units of Pleistene glacial outwash deposits composed of porous and highly permeable sand and gravel. The upper outwash unit is referred to as the Upper Glacial aquifer and the lower one as the Jameco gravel (200-250 ft depth). The two units are separated by a layer of interglacial Gardiners clay. Below the glacial deposits, coastal plain deposits are divided into the Magothy Formation (250-400 ft depth), the clay member of the Raritan formation (400-500 ft depth), and the Lloyd sand member of the Raritan formation (500-600 ft depth). Below 600 ft depths gneissic bedrock may be present.[38]

3.4.4 Regional Soils

The primary soil type at the former Floyd Bennett Field can be generally described as sand/gravel sand.

Soil at the former Floyd Bennett Field is primarily composed of dredge material from the Jamaica Bay channel and from the construction of a shipping harbor in 1928, with additional miscellaneous fill/urban rubble. Dredge material filled in the 1930s consisted of medium to fine quartz sand with some mica and traces of silt, as wells as small amounts of coal, oyster shells, and metal. Miscellaneous fill/urban rubble consisted of course to fine sand and gravel, crushed brick and cinders, broken glass, shells, and rubble. The fill material is largely loose and unconsolidated.[39]

3.4.5 Surface Water Hydrology

The most prominent surface water feature at the former Floyd Bennett Field is Jamaica Bay, located at the site's southern and eastern boundaries. There are no streams or other bodies of water on-site. Approximately half of the annual precipitation infiltrates to the water table and recharges the groundwater system, while the other half is either lost to evaporation or direct runoff to Jamaica Bay. [40]

3.4.6 Ground Water Hydrology

The groundwater at the former Floyd Bennett Field consists of glacial hydrologic units and coastal plain units. The upper glacial aquifer is composed of Pleistocene deposits, followed by the Jameco aquifer. The upper glacial aquifer is separated from the deeper aquifers by a layer of the Gardiners Clay unit, which restricts vertical flow between them. The coastal plain units, situated below the glacial hydrologic units, are divided into the Magothy aquifer and the Lloyd aquifer, separated by the Raritan clay confining unit, which restricts vertical flow between upper aquifers and the Lloyd aquifer. Crystalline bedrock underlies the Lloyd aquifer.[41]

Groundwater depth at Floyd Bennett Field is generally two to 20 feet below ground surface (bgs) and is perched above saline water. Groundwater flow is expected to be toward Jamaica Bay, but localized groundwater flow is tidally influenced close to the shoreline. The majority of the water that enters the groundwater system remains in the upper glacial aquifer and moves laterally to discharge to the surrounding saltwater bodies. [42]

3.4.7 Natural Resources (Threatened and Endangered Species)

The U.S. Fish and Wildlife Service (USFWS) have indicated that the following federally listed, threatened, or endangered species may inhabit Kings County on or near the former Floyd Bennett Field:

TABLE 3.4.7 **Federally Listed, Threatened, or Endangered Species** [43]		
Species Common Name	**Scientific Name**	**Status**
Red Knot	*Calidris canutus rufa*	Threatened
Northern Long-Eared Bat	*Myotis septentrionalis*	Proposed Endangered
Hawksbill sea turtle	*Eretmochelys imbricate*	Endangered
Leatherback sea turtle	*Dermochelys coriacea*	Endangered
Green sea turtle	*Chelonia mydas*	Threatened

Federally endangered and threatened species are protected by Federal law and must be considered prior to project development.

Candidate species are those species presently under review by the U.S. Fish and Wildlife Service for consideration for federal listing. Candidate species should be considered in the planning process in the event that they become listed or proposed for listing prior to project completion. Candidate species receive no statutory protection under the Endangered Species Act; however, if early evaluation of the project indicates that it is likely to affect a candidate species, technical assistance should be requested from the U.S. Fish and Wildlife Service.

No additional information on the occurrence of rare or endangered species or natural communities within the area of interest is known at this time. This does not mean that other State or Federally listed species may not be present. An on-site inspection by a biologist familiar with the project site and with the species listed is recommended to verify the presence, absence, or location of listed species or natural communities, and to definitively assess the potential for direct, indirect, and cumulative effects of hazardous substance releases associated with military munitions activities.

3.4.8 Historical and Cultural Resources

The National Register of Historic Places, as administered by the National Park Service, U.S. Department of the Interior did include listings of historic places within the boundaries of the site. Based on a 1978 drafted nomination, Floyd Bennett Field was listed in the National Register of Historic Places as being significant in the areas of transportation and military history with the emphasis on transportation during 1931 to 1941. The area listed encompasses land built entirely on fill within a tidal estuary that previously had been used in part as a garbage dump. [44]

There are no known cemeteries located on the property.

4 HISTORICAL PROPERTY SUMMARY

4.1 CHRONOLOGICAL PROPERTY HISTORY

4.1.1 1931 – 1941

Floyd Bennett Field began as a New York City's first municipal airport. City planners envisioned the airport as a successful enterprise for both private and commercial aircraft. During 1929 and 1930 a location was found, plans were drawn up, and construction began by pumping sand from Jamaica Bay onto Barren Island, eventually raising the island sixteen feet above mean low tide. The City of New York dedicated the airport as Floyd Bennett Municipal Airport on 26 June 1930.[45]

In 1931 the City of New York Docks Department issued a permit to the Navy Department to occupy and use hangar number 5 at Floyd Bennett Field and on 23 May 1931 the Navy designated it as Naval Air Station Brooklyn. By 11 June 1931, the Naval Reserve Aviation Base (NRAB) conducted operations from Hangar No. 5.[46] The Commandant Third Naval District designated NRAB Floyd Bennett Field as a component part under its command and made the facilities available to aviation squadrons of the New York Naval Militia for organization, administration, and training prescribed by the Secretary of the Navy.[47] An Army airmail facility also shared the field until 1934, when it moved to Mitchell Field.[48]

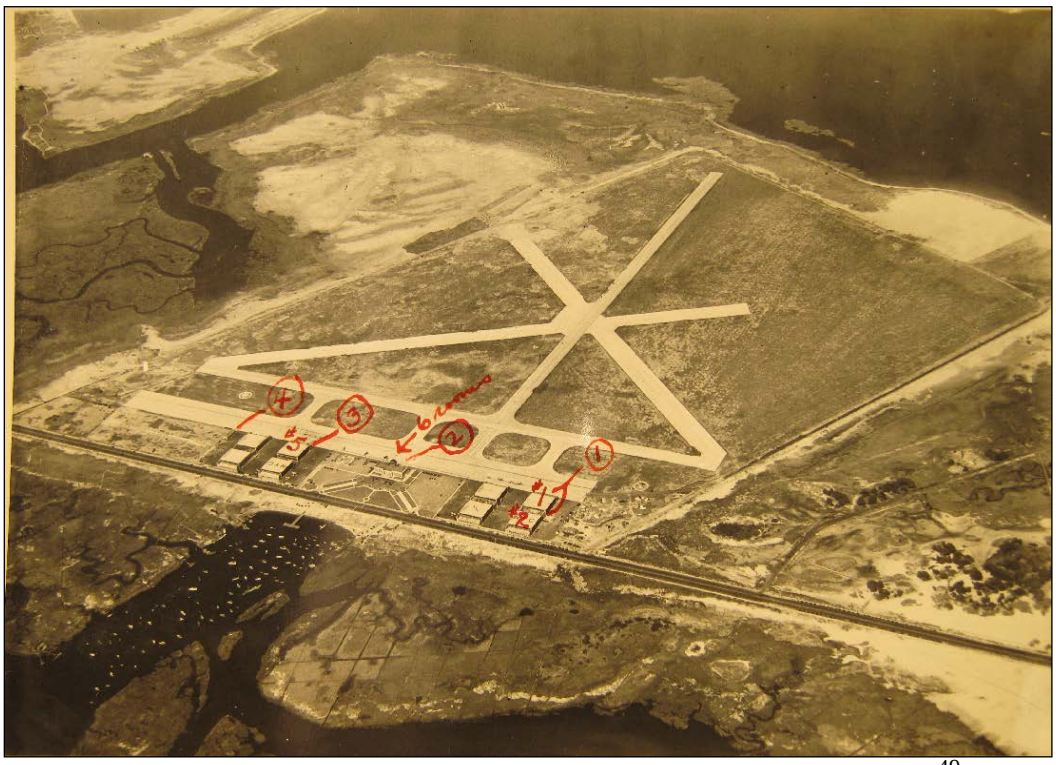


Figure 6 – Aerial view of Floyd Bennett Field - 1936[49]

The Navy assigned two aviation squadrons to NRAB Floyd Bennett. Each squadron consisted of one headquarters and three aviation divisions which included 46 officers and 109 enlisted men; however, neither squadron was completely up to full allotment. The Navy also organized a Marine Corps Reserve Observation Squadron at the NRAB including 18 commissioned pilots and 60 enlisted personnel.[50] Training included two phases: squadron training and elimination flight training. The squadron training mission of the NRAB was to train officers and men to augment the regular Navy aviation forces in time of national emergency. The training syllabus included solo familiarization, extended flights, 3-plane formations, principles of aerial navigation and radio communications, gunnery, and bombing. Elimination flight training was a secondary purpose or mission for the NRAB. Base personnel trained college graduates for thirty days in indoctrination flights and instruction. Upon successful completion of the course the students transferred to NAS Pensacola for advanced training and were then commissioned. After commissioning, they were required to spend a year of active duty with the Fleet after which they become associated with the reserve squadron in their districts.[51]

By 1935 the NRAB requested additional space for classrooms, expansion of machine and rigging shops for overhauling airplanes and engines, and storage. The NRAB recommended the unimproved area north of Floyd Bennett, approximately 472 acres consisting mostly of swamp land which could be reclaimed by filling and leveling.[52]

In December 1935, the Coast Guard began negotiations to establish an air station at Floyd Bennett Field.[53] On 21 January 1936, the City of New York granted a lease to the Coast Guard for five consecutive ten-year terms for a total of fifty years, expiring on 20 January 1986.[54] The Treasury Department awarded contracts for the construction of the Coast Guard Air Station to be completed by mid February 1938. The Coast Guard Air Station consisted of a plot of land 650 x 650 feet square located on the east side of Floyd Bennett Field. Plans included the construction of a hangar and barracks building, a seaplane ramp, a garage, an 8,000 gallon gasoline fueling system, necessary roads, aprons, and taxiways and a communications system.[55] Air sea rescues were the main mission of the Coast Guard Station, but early in World War II utility aircraft were armed with depth charges to deal with enemy submarines.

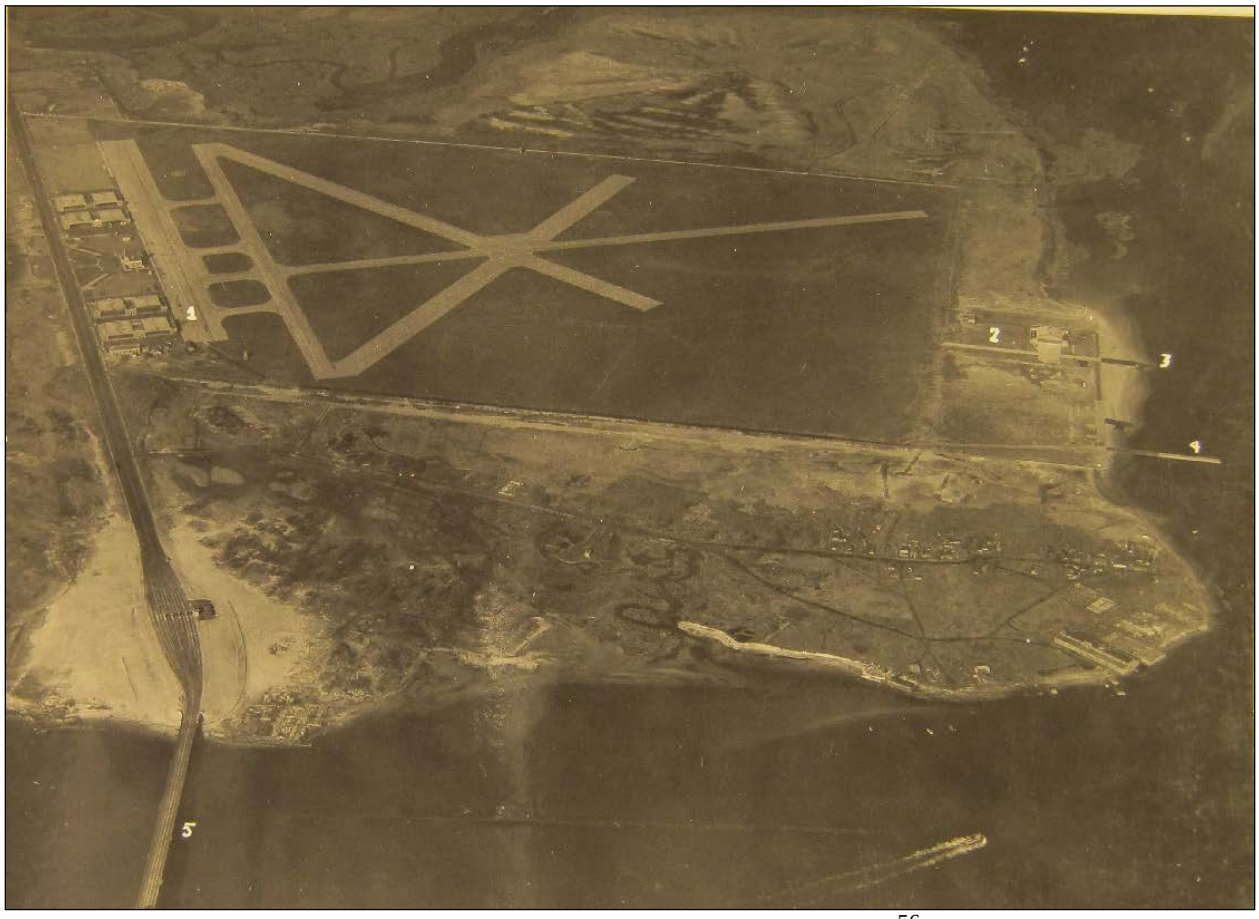


Figure 7 – Aerial View NAS NY - 1939[56]
Note: NRAB expansion (#1), Coast Guard Station (#2) and seaplane ramp (#3)

On 20 February 1940, the Navy obtained a second lease with the Commissioner of Docks, City of New York covering 16.4 acres of land for a seaplane base.[57] The Navy designated the seaplane base as NAS New York on 21 April 1941. The commanding officer of the NRAB assumed the additional duty of becoming the commander of both installations.[58] Official commissioning ceremonies occurred on 2 June 1941.[59] The mission of the NAS NY was to maintain and operate a base for naval aircraft units, to provide hangar storage and operation facilities for land and seaplanes, and to conduct overhaul and repair. Additional responsibilities included providing facilities for housing, berthing, and supply, providing facilities for the NRAB, and providing facilities for the squadron for the Patrol Wing stationed at the station.[60]

The amount of aircraft flying into and out of the Floyd Bennett Field increased during the fall of 1941. In addition to the NRAB's primary flying training activities, the Navy established the Aircraft Commissioning Unit on 27 August 1941to take possession of new airplanes from factories in the vicinity and fly them back to the station where they were equipped, flown, and tested prior to shipment abroad, delivery to the Fleet, or delivery to other Air Stations. Plans called for the installation of armament on the planes prior to shipping them out. By 20 October 1941 this mission's name changed to the

Aircraft Delivery Unit and it received on average 140 planes per month. Over the next several months, plans called for this rate to be increased to over 200 planes per month. A scouting squadron operating on wheels and floats was also located at NAS NY. Battleship and cruiser units carried out training exercises and plans called for a reserve carrier group to be added at the NAS.[61] By the fall of 1941 security for the protection of planes and the installation increased. Thirty-six Marines provided security with request for an additional 50 and a ten foot fence surrounding the field.[62]

Figure 8 – Looking west across north end of Floyd Bennett Field prior to expansion – 26 December 1941[63]

The Navy Department announced that it intended to purchase Floyd Bennett Field and adjacent land from the City of New York on 28 November 1941. By 18 February 1942 the field had been purchased and plans were in place to expand the size of the property from 387 acres to 1,288 acres by reclaiming large portions of Barren Island. Several miles of roads were constructed, long concrete runways were installed, and construction of a new seaplane hangar commenced.[64]

Figure 9 – Views of airplanes at Floyd Bennett Field circa 1942[65]

The Eastern Sea Frontier established the New York Air Patrol with the general duties of patrolling for observation of enemy surface and subsurface craft, aircraft, and the examination of suspicious merchant vessels. The NAS Station Emergency Air Division, a unit under the jurisdiction of the New York Air Patrol, operated at Floyd Bennett Field. It performed numerous scouting and bombing missions off shore until it ceased operations in June 1943.[66]

4.1.2 1942 – 1960

After World War II began, activities at Floyd Bennett Field accelerated further. In order to relieve congestion at the airfield, the Secretary of the Navy abolished the NRAB effective 1 July 1942, with attached personnel and equipment being distributed among other reserve aviation bases.[67] The Aircraft Delivery Unit grew so extensively that the commanding officer, in conjunction with the Bureau of Aeronautics, divided it into two sections: the Aircraft Equipment Division and the Aircraft Ferry Division. The Aircraft Equipment Division was responsible for testing and equipping the aircraft with armament, oxygen equipment, radar and other items. The Aircraft Ferry Division was responsible for ferrying the planes from factories into the station and then out to various points of destination. This division also trained and indoctrinated new ferry pilots.[68] By April 1942, Floyd Bennett Field was equipping 200 planes per month with the intention of gradually building up to 500 or 600 planes per month. By February 1945, the 20,000th plane was commissioned at NAS NY.[69] With the expansion of the ferrying mission to several installations located both on the east and west coasts, the Navy commissioned the Air Ferry Command on 1 December 1943, with headquarters at NAS NY.

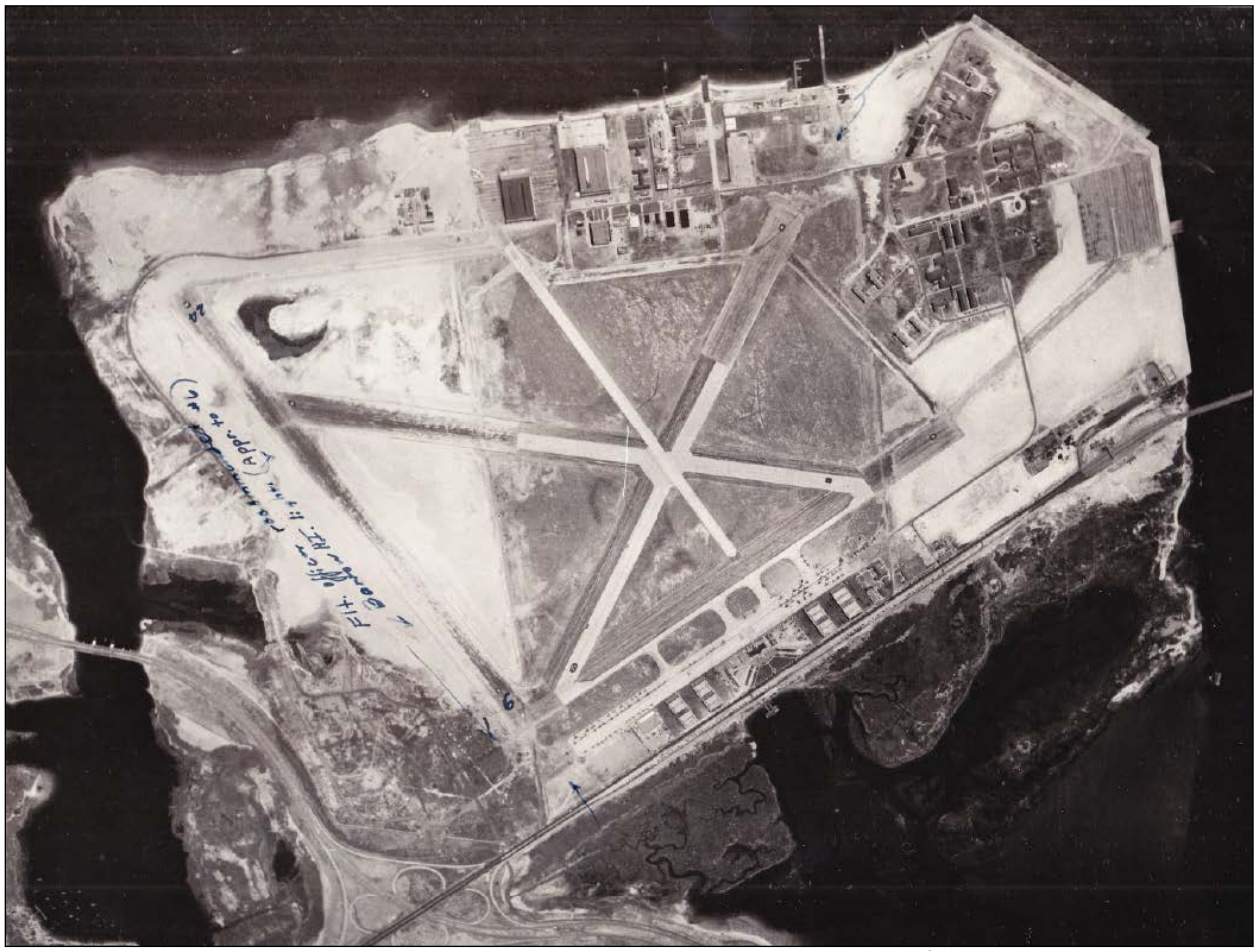


Figure 10 – View of NAS NY 3 July 1943[70]

On 19 November 1943, the Chief of Naval Operations directed the Coast Guard to become a helicopter training base. Three Sikorksky HNS helicopters were assigned to Floyd Bennett. The British Admiralty requested that the Coast Guard train a number of British pilots and mechanics and provided them with four of their own helicopters. By the end of the first year, one hundred pilots and one hundred fifty mechanics were taught to fly and service the helicopters. The Brooklyn Navy Yard requested tests be run using the helicopters as targets for radar calibrations of vessels undergoing overhaul in the navy yard. Testing proved successful and this became the primary function for the helicopters. Other missions included rescue and relief missions involving civilian and military personnel.[71]

Floyd Bennett Field also operated a terminal for the Naval Air Transport Service (NATS) which included transcontinental operations. Both material and personnel were flown from the installation. Floyd Bennett Field was also designated as a Military Air Transport Service terminal, making it one of the busiest airports in the U.S.[72]

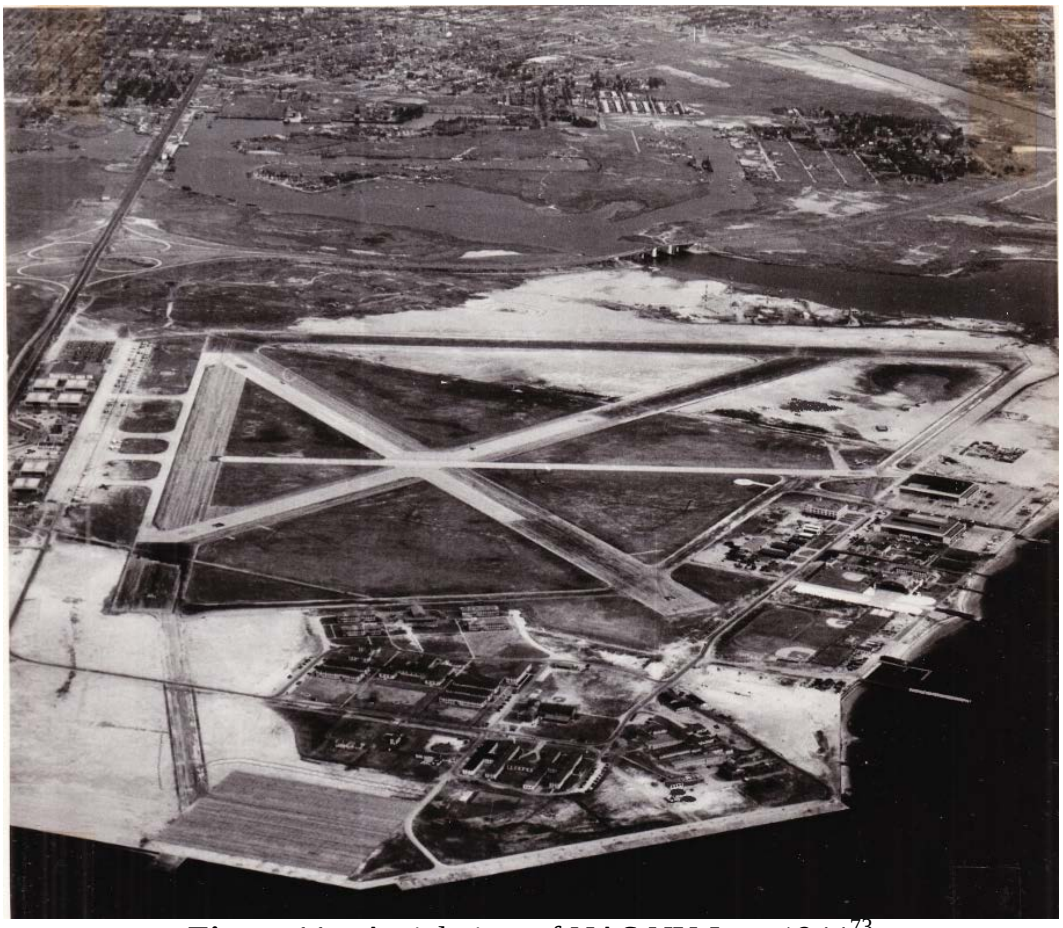


Figure 11 – Aerial view of NAS NY June 1944[73]

By 27 July 1945, the Chief Naval Operations discontinued combat aircrew training at Floyd Bennett Field. Personnel and equipment including pistols, shotguns, traps, turrets, and weaponry were made available to the Commandant of the Third Naval District.[74]

As World War II began winding down the New York Shipyard and Naval Base used the marginal wharf at NAS NY for berthing decommissioned vessels pending final disposal and scrapping.[75] The Chief of Naval Operations directed that NAS NY be placed in reduced operational status effective 1 January 1946. The remaining mission included supporting and providing facilities for the Naval Air Reserve Training Program, scheduled operations of the NATS, and providing certain facilities to the U.S. Coast Guard. All other facilities were placed in an inactivated service. Civilian personnel were used to maintain the station while in a reduced operational status.[76] The U.S. Marine Corps organized an air detachment at NAS NY and commissioned it on 29 March 1946.[77] By July 1946 the Navy reorganized NAS NY as a Naval Air Reserve Training Station under the jurisdiction of the Chief of Naval Air Reserves Training Glenview, IL. Its mission was to provide fully trained squadrons and an Air Wing staff for immediate Fleet mobilization in the event of a national emergency. Approximately 700 Navy and Marine Corps personnel staffed the station and on regularly scheduled weekends the population grew to over 3,000 reservists.[78]

By the end of September 1947 the Navy disestablished the NATS at NAS NY.[79] The decreased operational status of the installation opened the door to other branches of military services using the airfield. On 22 September 1947, members of the National Guard and the Army Air Reserve visited NAS NY to attend meetings concerning joint use of the installations.[80] By the end of the month the Navy granted Rights of Entry. The commanding officer of NAS NY requested the Bureau of Yards and Docks issue a formal permit, revocable at will in times of national emergency, to the Department of the Army for the accommodation of the Air National Guard of New York.[81]

The Air Force requested use of portions of the land and facilities located at NAS NY in October 1949. Revocable permit negotiations for the use of facilities and land began in October 1949 with additional modifications to that permit continuing into mid-1955.[82] The permit granted the U.S. Air Force Reserve and Air National Guard Units permission to use and occupy facilities (see following figure).

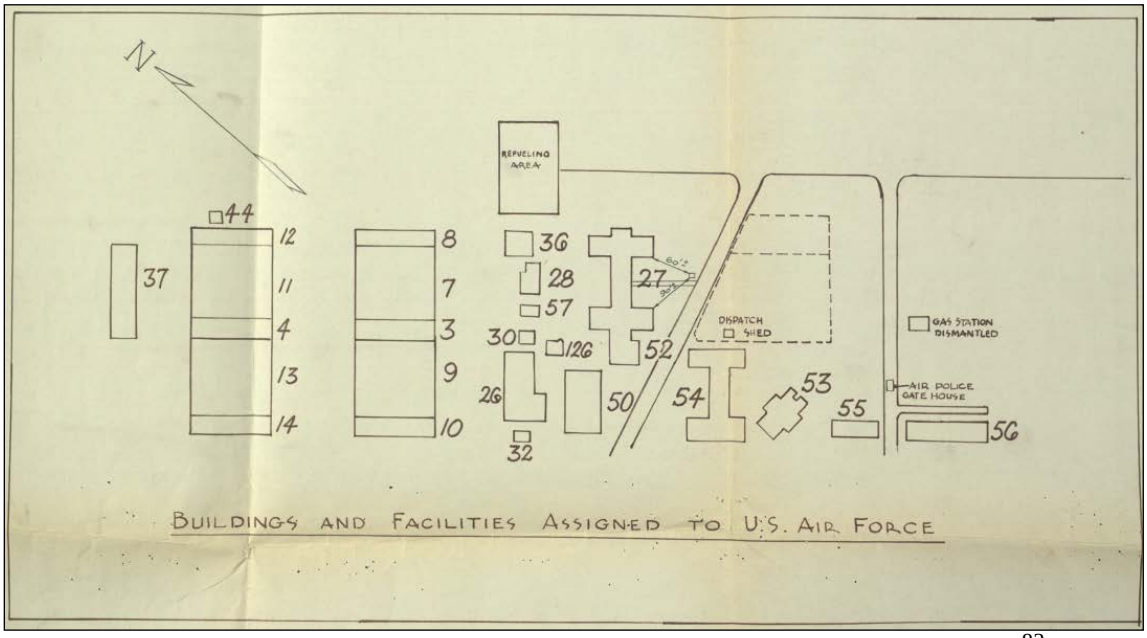


Figure 12 – Buildings Assigned to the Air Force during the 1950s[83]

During March 1952 the Army requested a portion of Floyd Bennett Field for use by the anti-aircraft artillery command. Over the next several months negotiations of a revocable permit for the establishment of a 90mm anti-aircraft artillery battery ensued.[84] On 31 October 1952 the Department of the Navy granted a use permit (NOY(R)-46946) for 5.5 acres for the establishment of a 90mm anti-aircraft artillery battery on the southern edge of the property (see following figure). The 90mm gun battery served as one of a number of similar batteries to provide interim ground-to-air defense of New York City and other metropolitan areas until the Nike defense systems became fully operational.[85] This permit for the gun ended on 31 January 1958. Note that the 90mm gun battery is located within the ineligible parcel currently owned by the U.S. Marine Corps.

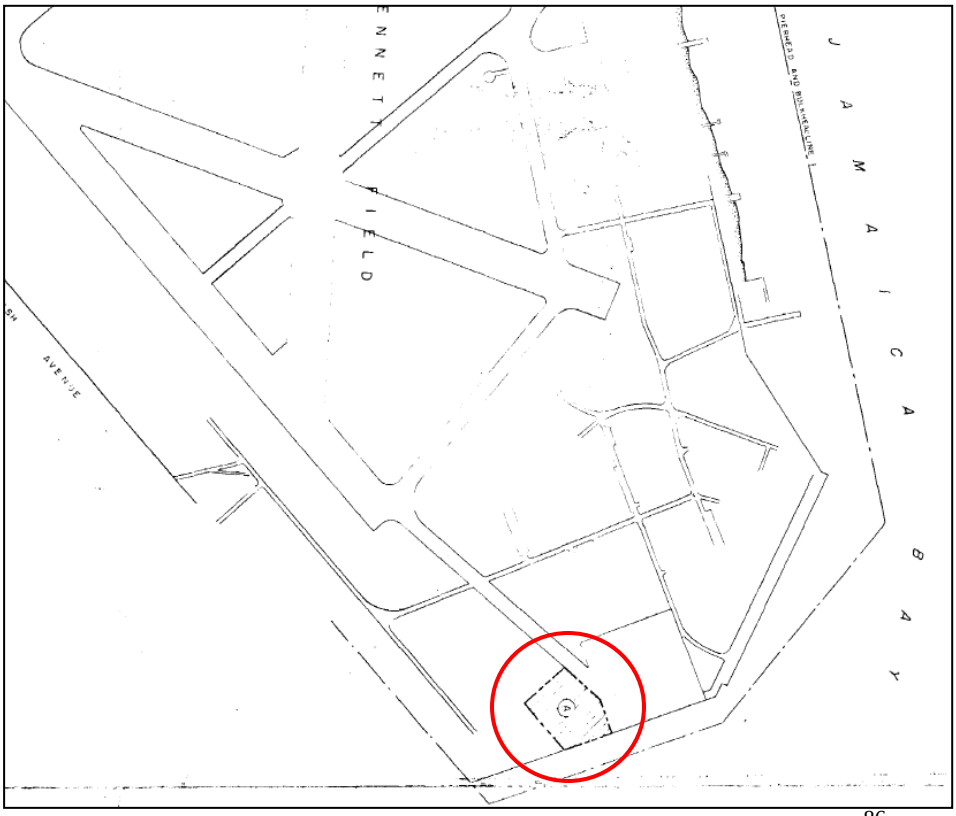


Figure 13 – 90mm AAA Battery Location 13 May 1953[86]

4.1.3 1960 – 1971

During the 1960s NAS NY supported the training and administration of selected reserves of 19 operating squadrons and six units comprised of personnel from the Connecticut, New York and New Jersey areas. The primary mission included maintaining and operating facilities and providing services and material to support units of the Naval and Marine Air Reserve Training Command and other activities designated by the Chief of Naval Operations.[87]

Figure 14 – View of NAS NY on 7 March 1965[88]

On 6 March 1970 the Navy announced NAS NY would close no later than 30 June 1971. Activities throughout the next several months focused on the drawing down and eventual closure of the installation. By 1 November 1970, Floyd Bennett Field was closed to flight operations and on 10 November the commander departed on the last authorized flight from the field. A civilian caretaker force was authorized to support the Naval Air Reserve Training Detachment New York and for activities associated with the inactivation of the station. By February 1971 the last military personnel were detached and all buildings were closed except those supporting remaining government activities. The U.S. Coast Guard operated on its owned portion of the field and was granted permission to use various Navy owned land and buildings pending disposal of the real property. The New York City Police Aviation Bureau continued using portions of Floyd Bennett for helicopter flight operations. The U.S. Army Reserve unit also operated helicopters from the field without Navy support. Naval Air Reserve Training Detachment New York used the field for training 1,300 selected non-flying air reservists.[89]

4.1.4 1971 – Present

Several different plans emerged for the reuse of Floyd Bennett Field; however, in May 1971 President Nixon announced it would be incorporated into the Gateway East Recreation Area operated by the NPS.[90] On 28 January 1975 excess land at Floyd Bennett Field consisting of approximately 1,079 acres transferred to the NPS.[91]

The Navy transferred approximately 90 acres to the U.S. Coast Guard in 1973. The Coast Guard transferred the tract to the NPS sometime after 1987.[92]

The Navy retained approximately 113 acres after October 1987. A Naval Air Reserve Training Detachment occupied approximately 29 acres and the remainder was used for family housing and an Armed Forces Reserve Center. By the late 1990s approximately 70 acres were transferred to the Marine Corps for use as a Recruit Training Center. The Navy transferred the remainder of the property to the National Park Service between 1987 and 2012, although the transfer date is unknown.[93]

Today the majority of the former Floyd Bennett Field makes up a small portion of land within the Gateway National Recreation Area of New York and New Jersey operated by the NPS, with approximately 70 acres used by the Marine Corps as a Recruit Training Center.[94]

4.2 MILITARY OPERATIONS

4.2.1 Operations Involving Military Munitions

4.2.1.1 Summary of Munitions Activities

Throughout its history with different elements of the military (i.e. Navy, Marine Corps, Air Force, and Coast Guard), munitions activities at the former Floyd Bennett Field included storage of various types of high explosives, small arms ammunition, pyrotechnics, and practice aviation ammunition for use at ranges on site and in the vicinity of the airfield. The ranges consisted of a gun test backstop (i.e. firing-in-butt), two pistol and skeet ranges, one trap range, at least five proposed or actual indoor pistol ranges, and at least one confirmed off-base bombing area.

The following paragraphs provide detail on the storage areas and ranges.

4.2.1.2 NRAB Magazines

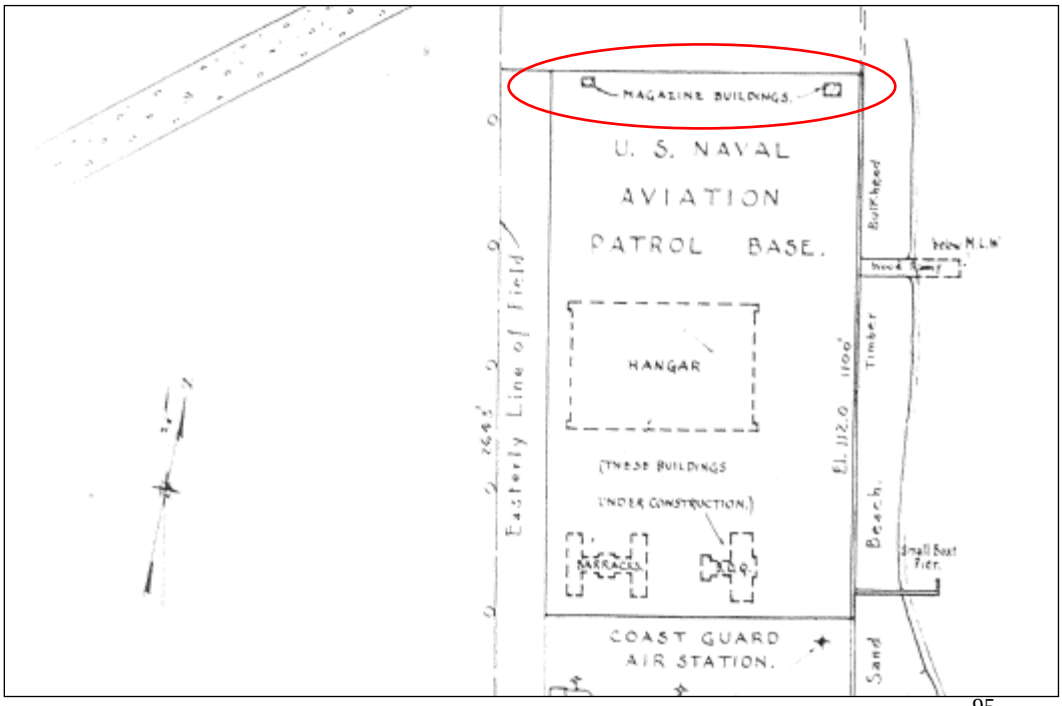


Figure 15 – Naval Aviation Patrol Base magazines 30 June 1940[95]

On 26 February 1940, the Navy awarded a contract for the construction of two magazines at the Naval Aviation Patrol Base, Floyd Bennett Field. Plans called for one 20 foot by 26 foot underground reinforced concrete arch-type bomb storage magazine, with protection walls and ramps and one 23 foot by 14 foot reinforced concrete frame building type small arms magazine. Construction of the magazines located in the northeastern section of the base began on 17 June 1940 and completed on 28 August 1940.[96] The two ordnance magazines were located approximately 200 yards north of the seaplane hangar. One was used exclusively for the storage of small arms ammunition including cartridges less than one inch in caliber and shotgun shells. The other magazine was used for bomb storage.[97]

During the construction of Hangar B in 1942, two ammunition magazines were removed but a pyrotechnic house near the bulkhead was retained.[98] The pyrotechnic house or the "third magazine" near the bulkhead is not delineated on obtained maps. According to the 2009 NPS Cultural Landscape Report one underground ammunition magazine was constructed in this area.[99] It is possible that the pyrotechnic magazine is the underground magazine the report discusses.

4.2.1.3 Coast Guard Ammunition Locker

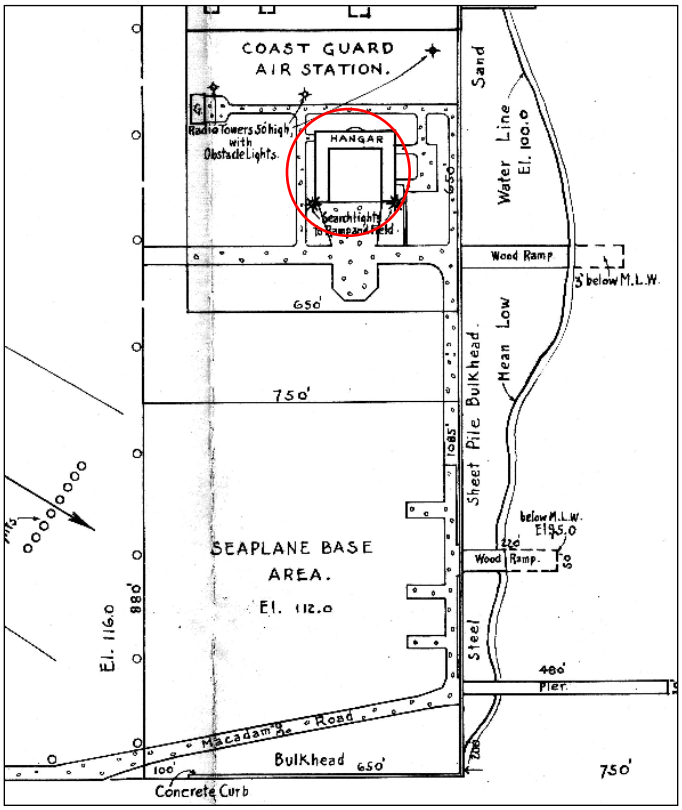


Figure 16 – Ammunition Locker in CG Hangar[100]

The 1937 Coast Guard construction plans called for an ammunition locker to be located in the hangar building, though no further information on the Coast Guard ammunition locker was determined.[101]

4.2.1.4 World War II Era Magazine Complex

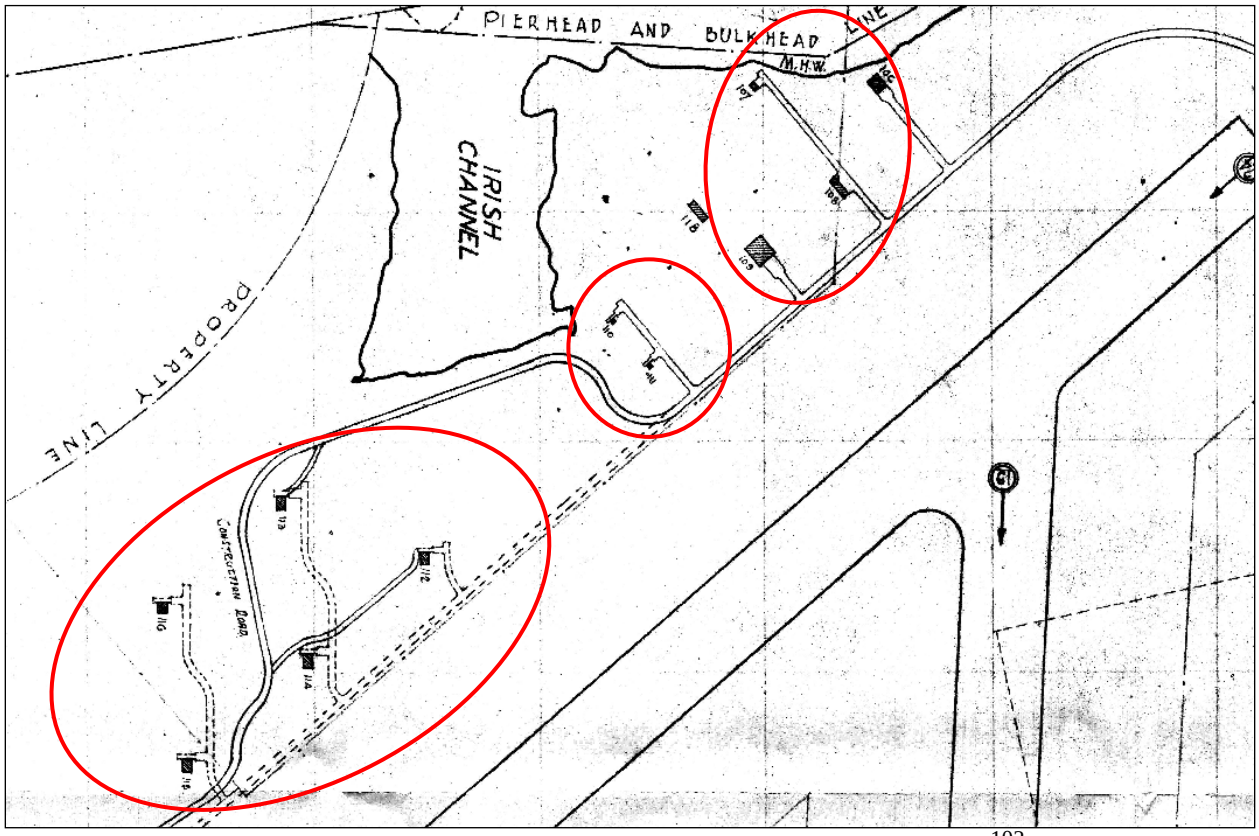


Figure 17 – Ordnance Storage Buildings 30 June 1942[102]

By the end of June 1942, the Navy constructed or was in the process of constructing ordnance magazines on the north end of the field on reclaimed lowlands. Early on, five of the numbered ordnance storage buildings (112 to 116) were identified with letters A to E.[103] Although most maps and drawings label these structures as buildings numbers 106 to 116, sometime in 1943 the Navy renumbered the buildings using a number letter sequence; however, the installation maps obtained do not describe them as such.

TABLE 4.2.1.4A
World War II Era Magazines

Building Number	Description	Dates of Use	Renumbered in 1943
106	Inert Storage	1942-	1SH2
107	Smoke Drum	1942-	1SD1
108	S.A. Pyrotechnics	1942-	1Y1
109	Practice Bomb Storage	1942-	1SH1
110	Fuse and Detonators	1942-	2HTC1
111	Fuse and Detonators	1942-	2HTC2
112 (E)	H.E. Magazine	1942-	1BTC5

TABLE 4.2.1.4A World War II Era Magazines			
Building Number	**Description**	**Dates of Use**	**Renumbered in 1943**
113 (D)	H.E. Magazine	1942-	1BTC4
114 (C)	H.E. Magazine	1942-	1BTC3
115 (A)	H.E. Magazine	1942-	1BTC1
116 (B)	Warhead	1942-	1WTC2

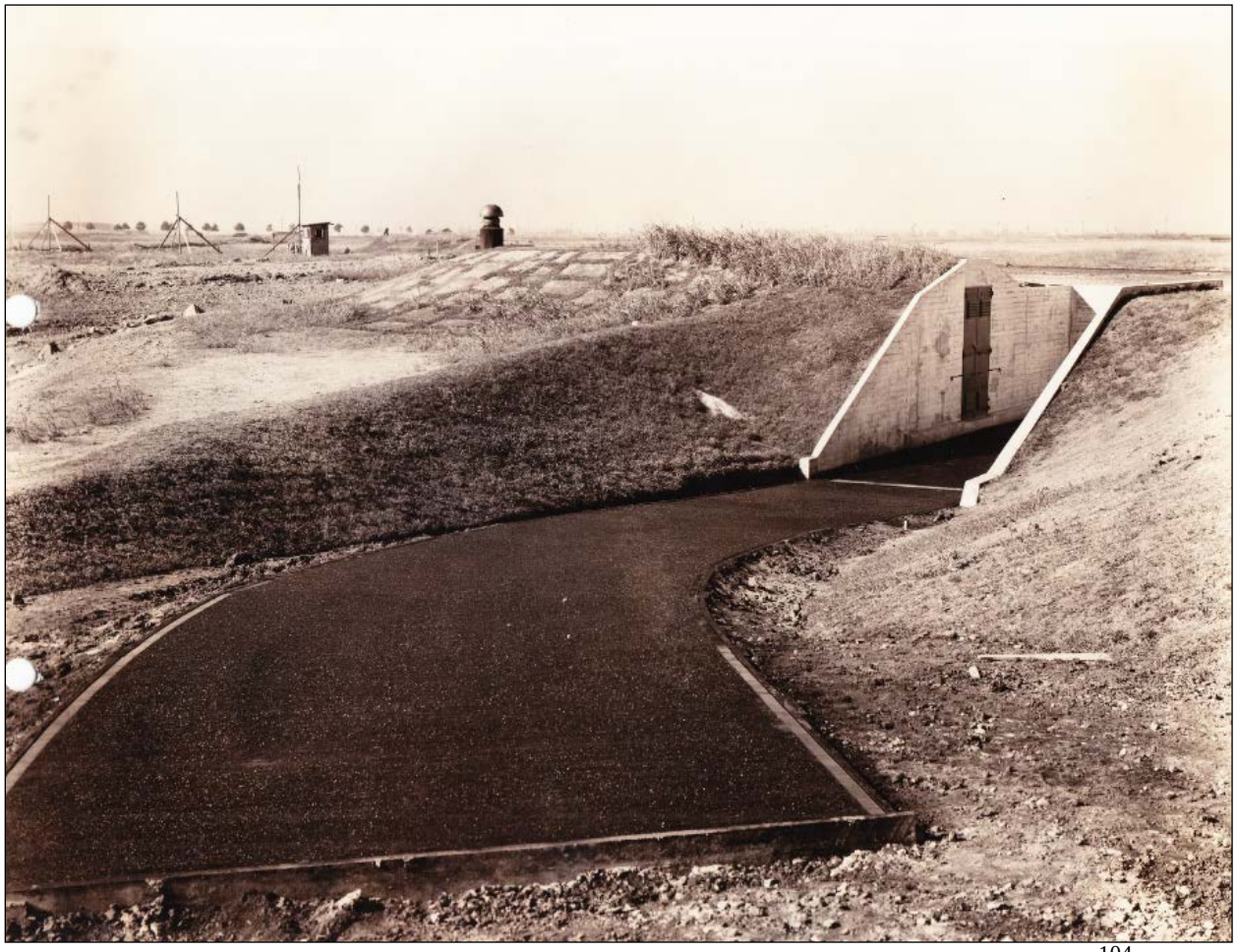


Figure 18 – View of Magazine C or Building 114 on 30 September 1942[104]

The magazines area was still under construction during March 1942 but at least one magazine was already being used for storage.

One arch type magazine loaded to capacity included the following:

130	325 lb. depth bombs
268	100 lb. bombs
50,550 lbs	Explosives[105]

Figure 19 – Magazine E (Building 112) under construction on 24 February 1942[106]

Figure 20 – Magazine C (Building 114) on left and E (Building 112) on right during construction February 1942[107]

Comprehensive munition stowage at Floyd Bennett Field is not available but the following three tables provide inventories of these holdings in 1947 and 1948. Some of the magazines are housing items different from their intended purpose.[108]

TABLE 4.2.1.4B
Stowage Distribution and Available Space for Ammunition and Explosives
31 March 1947

Building Number	Type/Size	Stowage Assignment/Approved Capacity	Material Stowed	Available Stowage Capacity
106 1SH2	Inert / 16’8” x 46’6” x 5’	Inert / 46,500 Cu. Ft.	Inert	22,370 Cu. Ft.
107 1SD1	Smoke Drums 256 Units	Smoke Drums 256 Units	Smoke Drums	21 Units
108 1Y1	Pyrotechnics / 14’6” x 24’6” x 32’4”	Pyrotechnics / 11,486 Cu. Ft.	Pyrotechnics	None
109 1SH1	Practice Bombs / 11’ x 79’6” x 70’8”	Practice Bombs / 61,775 Cu. Ft.	Practice Bombs	41,247 Cu. Ft.
110 2WTC1	Fuzes / 7’8” x 10’ x 14’	Fuzes 1,050 Cu. Ft.	None	7’8” x 10’ x 14’
111 2WTC2	Fuzes / 7’6” x 10’ x 14’	Fuzes 1,050 Cu. Ft.	Detonators	7’6” x 10’ x 14’
112 1BTC5	H.E. / 25’ x 50’ x 11’	Bombs	Small Arms	None
113 1BTC4	H.E. / 25’ x 50’ x 11’	Bombs / 143,000	Bombs	100,912 lbs
114 1BTC3	H.E. / 25’ x 50’ x 11’	Bombs / 143,000	Depth Charges	1,000 Sq. Ft.
115 1BTC1	H.E. / 25’ x 50’ x 11’	Bombs / 143,000	Rocket Motors	13,168,675 Cu. Ft.
116 1WTC2	H.E. 44’6” x 34’	Warheads / 143,000	None	44’6” x 34’

TABLE 4.2.1.4C **Stowage Distribution and Available Space for Ammunition and Explosives** **31 June 1947**				
Building Number	**Type/Size**	**Stowage Assignment/Approved Capacity**	**Material Stowed**	**Available Stowage Capacity**
106 1SH2	Inert / 16’ x 46’ x 60’	Inert / 46,500 Cu. Ft.	Inert	20,000 Cu. Ft.
107 1SD1	Smoke Drums 250 Units	Smoke Drums 250 Units	Jet Fuel	21 Units
108 1Y1	Small Arms/ Pyrotechnics 14’6” x 24’6” x 32’4”	Small Arms/ 17,407 Cu. Ft.	Small Arms / Pyrotechnics	250 Units Temporary Storage
109 1SH1	Practice Bombs / 11’ x 46’ x 60’	Practice Bombs / 61,775 Cu. Ft.	Practice Bombs	None
110 2WTC1	Fuzes / 7’6” x 10’ x 14’	Fuzes 1,050 Cu. Ft.	None	1,050 Cu. Ft.
112 1BTC5	H.E. / 25’ x 50’ x 11’	Bombs	Small Arms	4,000 Cu. Ft.
113 1BTC4	H.E. / 25’ x 50’ x 11’	Bombs / 143,000	Bombs	100,912 lbs
114 1BTC5	H.E. / 25’ x 50’ x 11’	Bombs / 143,000	None	13,750 Sq. Ft.
115 1BTC1	H.E. / 25’ x 50’ x 11’	Bombs / 143,000	None	13,750 Cu. Ft.
116 1WTC2	H.E. 44’5” x 34’ x18’	Warheads / 143,000	Small Arms	30,000 Cu. Ft.

TABLE 4.2.1.4D **Stowage Distribution and Available Space for Ammunition and Explosives** **December 1948**				
Building Number	**Type/Size**	**Stowage Assignment/Approved Capacity**	**Material Stowed**	**Available Stowage Capacity**
106 1SH2	Inert / 16’8” x 46’6” x 5’	Inert / 46,500 Cu. Ft.	Inert	None
107 1SD1	Smoke Drums / 256 Units	Smoke Drums 256 Units	Smoke Drums	21 Units

TABLE 4.2.1.4D
Stowage Distribution and Available Space for Ammunition and Explosives
December 1948

Building Number	Type/Size	Stowage Assignment/Approved Capacity	Material Stowed	Available Stowage Capacity
108 1Y1	Small Arms/ Pyrotechnics 14'6" x 24' x 32'	Small Arms/ 17,407 Cu. Ft.	Small Arms	4,000 Cu. Ft. / No Pyrotechnics Stored
109 1SH1	Practice Bombs / 11' x 79'6" x 70'8"	Practice Bombs / 61,775 Cu. Ft.	Practice Bombs	None
110 2WTC1	Fuzes / 7'6" x 10' x 14'	Fuzes 1,050 Cu. Ft.	None	1,050 Cu. Ft.
111 2WTC2	Fuzes / 7'8" x 10' x 14'	Fuzes 1,050 Cu. Ft.	None	1,050 Cu. Ft.
112 1BTC5	H.E. / 25' x 60' x 11'	Bombs / 143,000	Small Arms Ammo	4,000 Cu. Ft. / Temporary Storage
113 1BTC4	H.E. / 25' x 60' x 11'	Bombs / 143,000	Rockets	10,000 Cu.
114 1BTC5	H.E. / 25' x 56' x 11'	Bombs / 143,000	Jato Units	13,750 Sq. Ft. / Coast Guard equipment
115 1BTC1	H.E. / 25' x 50' x 11'	Small Arms Ammo	None	National Guard (equip)
116 1WTC2	H.E. 44'5" x 34' x18'	Warheads / 143,000	Small Arms	30,000 Cu. Ft.

On 5 August 1953 the Bureau of Ordnance inspected ammunition and explosives stowage and handling at Floyd Bennett Field. The inspection found the magazines were well kept and met the required standards. There were a few noted exceptions including Magazine 1Y1B (building 108) having incompatible stowage issues. The inspection noted CN tear gas grenades, HC smoke grenades, night drift signals, aircraft emergency identification signals, practice miniature bomb signals, parachute flares and about 560 night depth charge markers (water activated) were stowed in 1Y1B or building 108. The report recommended placing appropriate warning signs on the magazine stating water must not be used to fight fires in certain classes of materials stored within. It further recommended the small quantity of CN tear gas grenades, the HC smoke grenades, and the water activated night depth charge markers be placed in the smoke drum magazine 1SDX1, or building 107, and if the magazine did not meet the standards request a waiver.[109] By 20 October1953, Floyd Bennett Field requested permission for the Smoke Drum magazine

1SDX1, building 107, be used for storage of 200 CN tear gas grenades, 400 HC smoke grenades, and 300 night depth charge markers.[110]

The same inspection reported black powder spotting charges were stowed in magazine 2HTC2 (assumed building 111) without appropriate safety signage.[111] The November 1956 inspection reported that the Sub-Caliber Aerial Rockets should be returned to magazines and put back in original containers from which they were removed.[112] The inspection report does not indicate which magazines the rockets were stored in.

4.2.1.5 Ready Ammunition Storage and Lockers

Beginning in 1943 maps list Buildings 41-45 and 94 as ammunition storage, ready ammunition lockers, or torpedo storage (see following figure).[113]

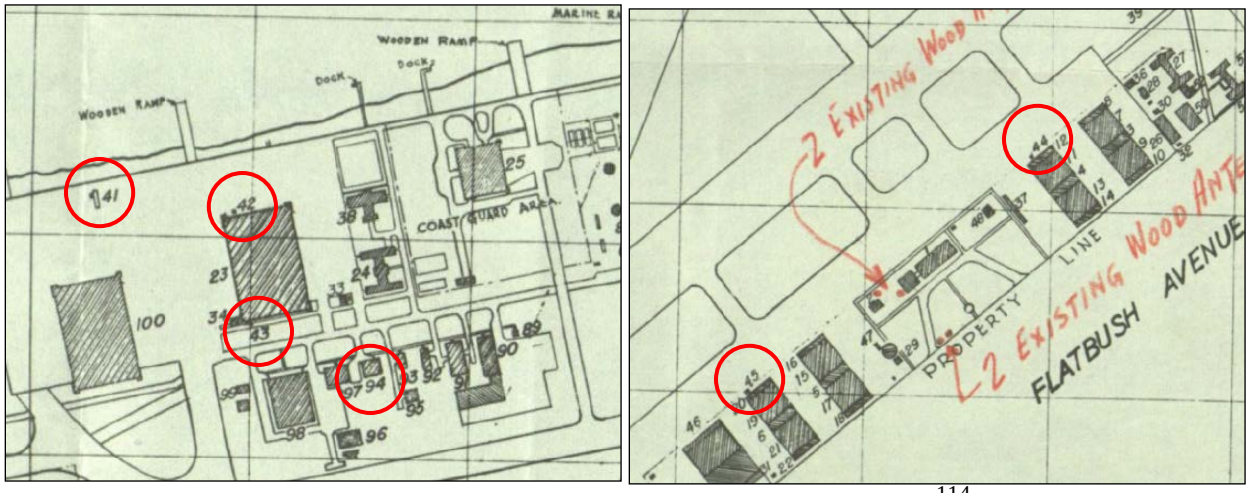


Figure 21 – Ordnance Structures by June 1944[114]

The following photo shows the numbered ordnance storage buildings on the east side of the base. In 1957 a public works maintenance report states a cement block ready locker is located within 15 feet at the northeast corner of Hangar B (building 100) and is used for the storage of pyrotechnics.[115]

Figure 22 – Aerial view of ammunition lockers, magazine, and torpedo storage 1950c[116]

TABLE 4.2.1.5 Ready Ammunition Storage Lockers		
Building Number	**Description**	**Dates of Use**
41	Ammunition Storage	1944-1956
42	Ready Ammunition Locker	1944-Demolished 1953
43	Ready Ammunition Locker	1944-Demolished 1953
44	Ready Ammunition Locker	1944-?
45	Ready Ammunition Locker	1944-?
94	Torpedo Storage	1944-1950
15 feet from northeast corner of Building 100	Pyrotechnic Ready Locker	1950-?

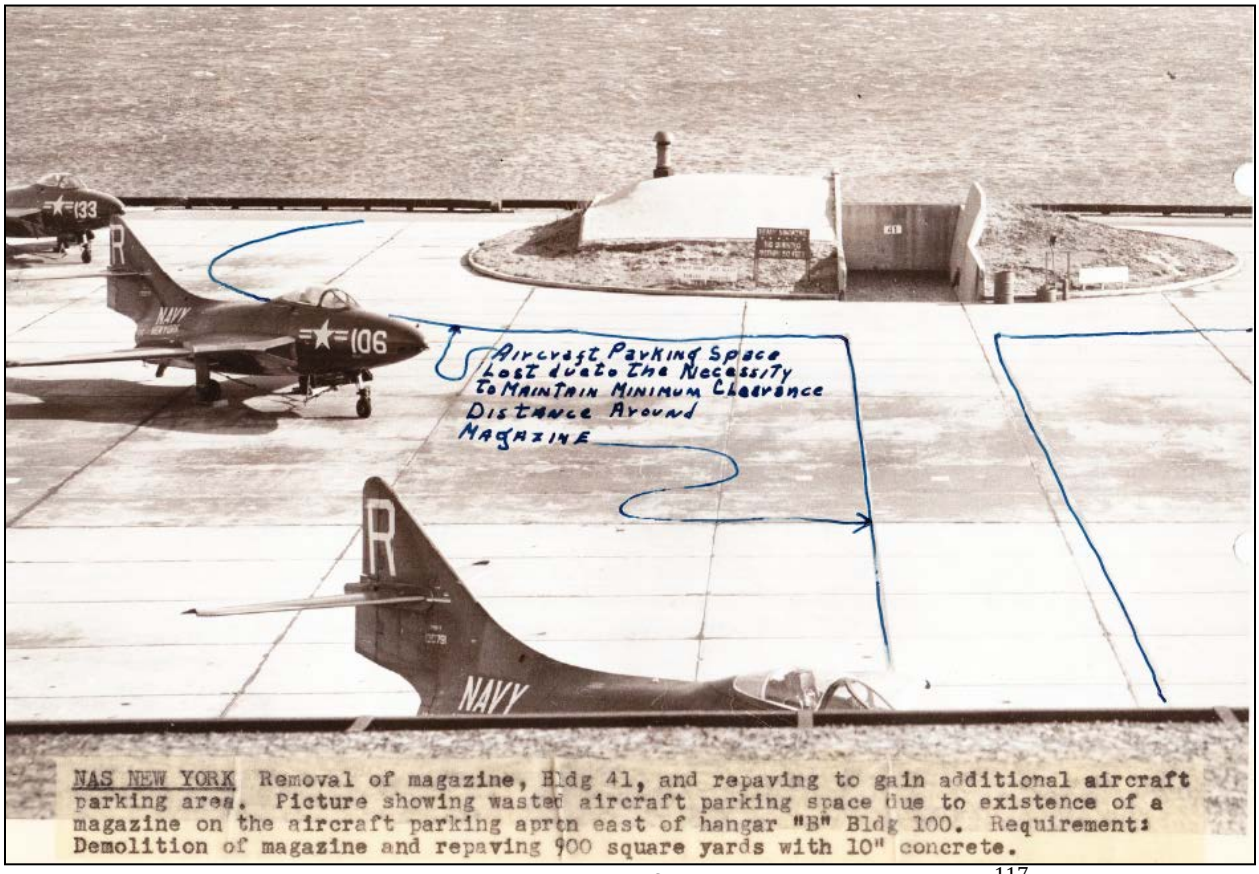


Figure 23 – Building 41 view from 17 November 1955[117]

By March 1957, public works plans called for the removal of Building 41 as a ready ammunition storage facility located in the aircraft parking area east of Hangar B (Building 100) near the seawall. The magazine, a non-standard type, was constructed many years earlier before the aircraft parking apron was extended to the seawall. The magazine and required safety distance buffer occupied approximately 5,000 square yards of space needed for aircraft parking. During heavy rainfall the magazine flooded and was an unreliable storage space for ready ammunition of any type.[118]

Construction plans from 1955 included Buildings 168 and 169 although their actual construction date is unknown. A March 1957 public works maintenance and repair report proposes the construction of four ready ammunition lockers, which had been proposed at least two times prior.[119] It appears the four ready ammunition lockers are contained within buildings 168 (3 bay segregated storage) and 169. The first obtained map showing Buildings 168 and 169 is from 1968 (see following figures). The two buildings are located north of the scrap yard which is north of Hangar B, Building 100, on the eastern side of the installation. The Naval Air Reserve Training Program training syllabus required small arms, pyrotechnics, explosives and projectiles, and 20mm HEI service ammunition be maintained in ready stowage. Buildings 273 and 374 shown on the map above are listed as a generator building and a remote revr. (sic) building.[120]

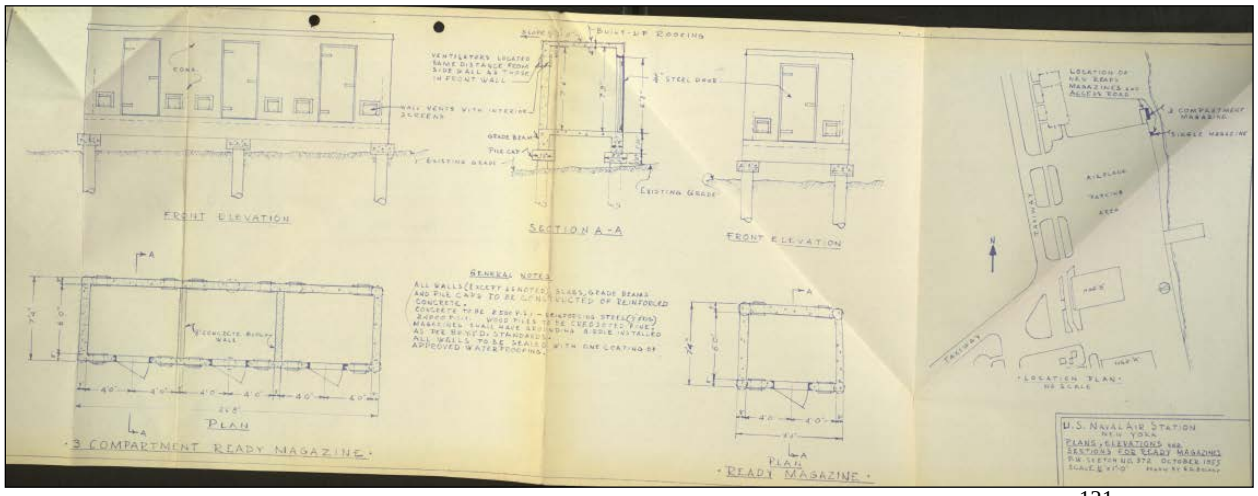


Figure 24 – Plans and Sections for Ready Magazines October 1955[121]

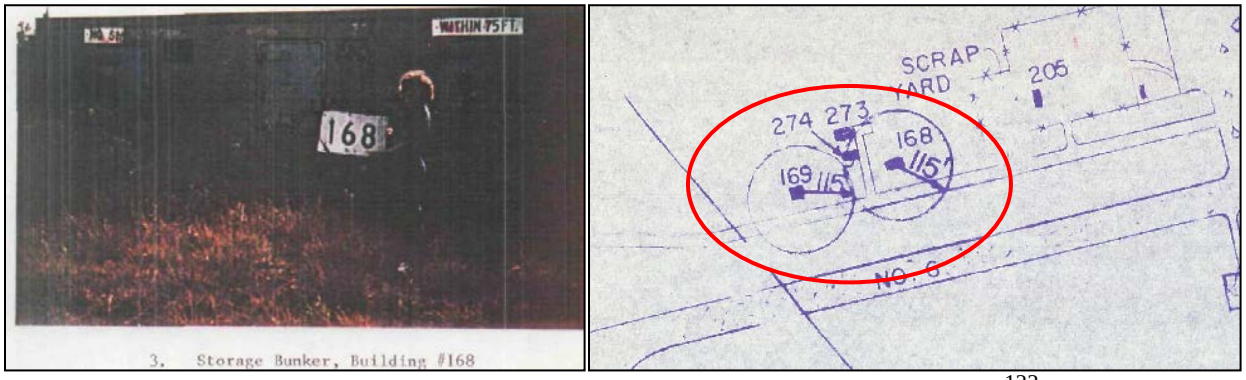


Figure 25 – Buildings 168 and 169 Storage Bunker 1968[122]

4.2.1.6 Indoor Small Arms Ranges

4.2.1.6.1 Proposed Indoor Rifle Range and Two Pistol Ranges

On 20 June 1941, the Commanding Officer of NAS Floyd Bennett requested the Works Progress Administration make improvements to certain buildings and the field. Requested improvements included "*Building of rifle range 140' long in unused tunnel leading from the Administration Building to the Field. Building of two pistol ranges 50' long in the same location. Cementing up of exits originally designed to lead from the tunnel to the Field apron, which exits are now supported by timber which at some future date may collapse from the weight of heavy planes passing over such support.*"[123] No further information in historical documents or maps describe if these ranges were constructed. According to the NPS facility manager, a tunnel currently exists but there is no indication that it was ever used as an indoor rifle or pistol range.

4.2.1.6.2 Indoor Boresighting and Target Butts

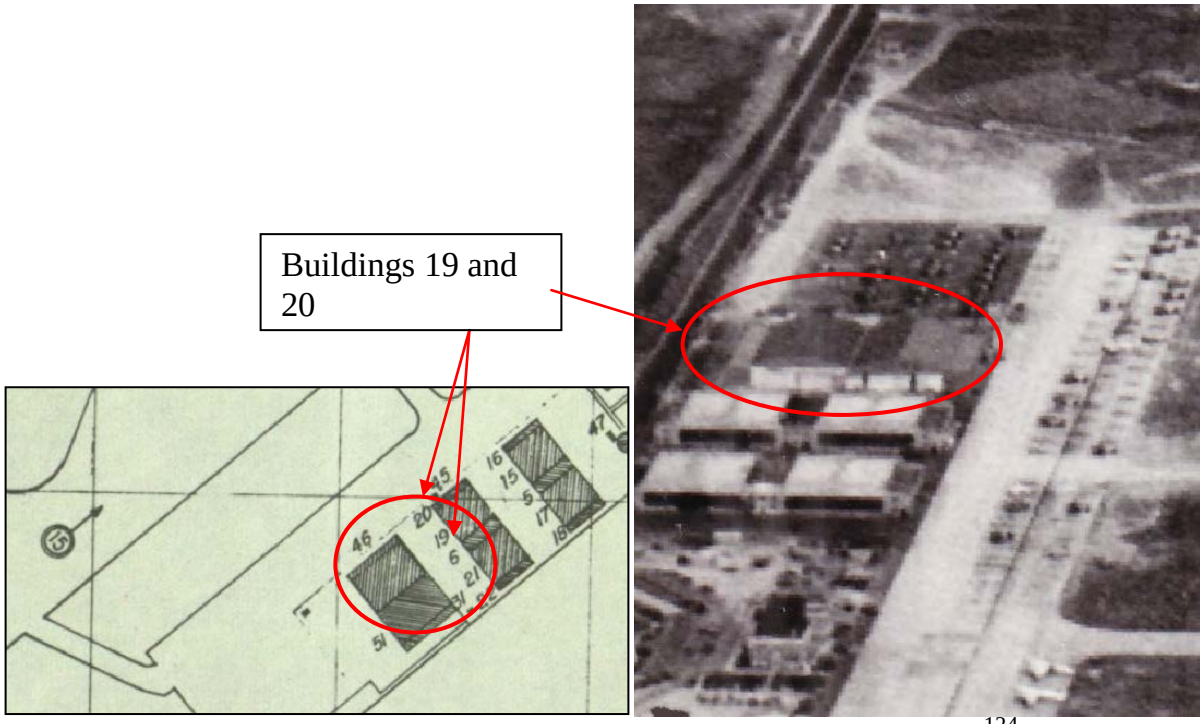


Figure 26 – Buildings 46 (Hangar 9) and 51 (Hangar 10) [124]
Note: Probable location of indoor boresight range and butts

In December 1942 the Navy considered building facilities to handle the installation of ordnance equipment in planes being processed at this station in its capacity as an aircraft delivery unit. Additional plans called for a shed and butts at one end for airplane machine gun testing.[125] Originally the construction of the building and shed with the butts was to be located north of Hangars 7 and 8 (Buildings 19 and 21). On 2 April 1943 the Bureau of Yards and Docks approved contract NOy-5176 for the construction of a building (approximately 60 foot by 180 foot) enclosing three butts for boresighting and testing.[126] It appears that Buildings 46 and 51 (Hangers 9 and 10) were constructed for the aircraft delivery unit. However, it is unconfirmed if the boresight and butt were constructed and used as planned.

4.2.1.6.3 Indoor Rifle Range

During February 1947, the Marine Air Detachment moved into permanent quarters with all activities under one roof including offices for both detachment and squadron administration, officers ready room, parachute and flight gear issue room, an indoor rifle range, and a club for enlisted personnel.[127] Building 72 is listed as Marines-Barracks No. 15 on a 30 June 1947 map (see following figure).[128]

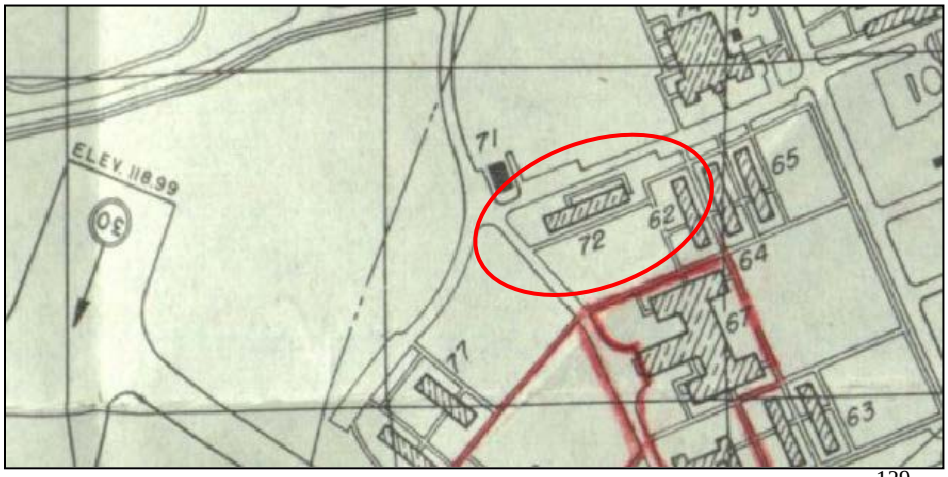


Figure 27 – Marine Corps Indoor Rifle Range 30 June 1947[129]

4.2.1.6.4 Indoor Pistol Range

The Navy opened an Indoor 25-yard Pistol Range located in the police hangar (Hanger 4 or Building 13) on the west side of the installation on 21 November 1963 (see following figure). Maintenance Department and Public Works personnel constructed the pistol range. The backstop consisted of 5/8 inch armor plate welded together weighing more than 7,000 pounds and put in place by forklift. The pistol range was used for familiarization and qualifying personnel in the use of small arms and target practice.[130]

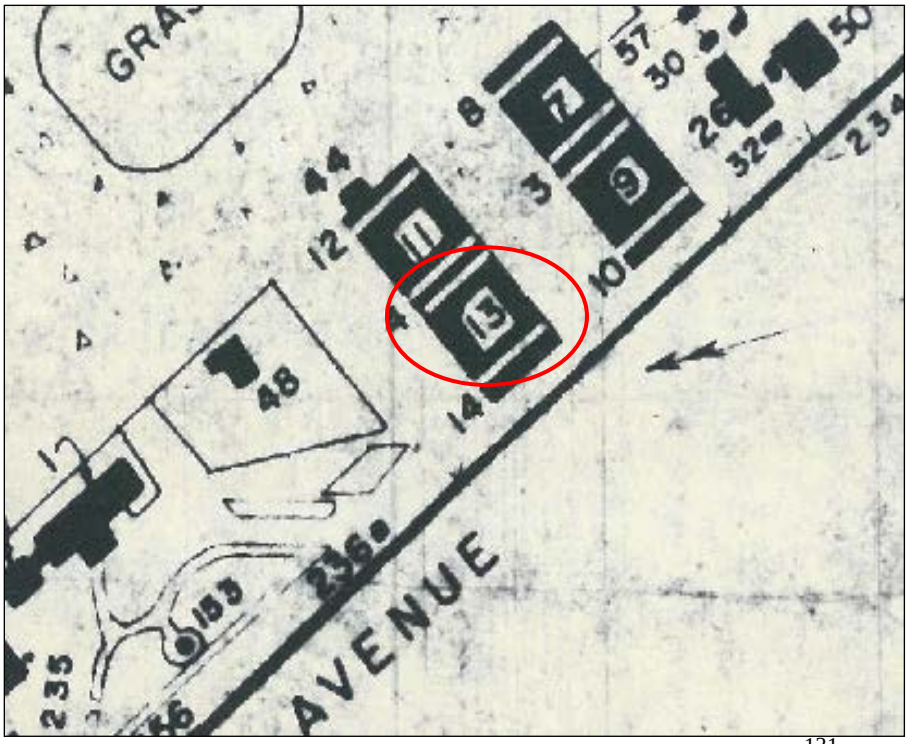


Figure 28 – Pistol Range in Hanger November 1963[131]

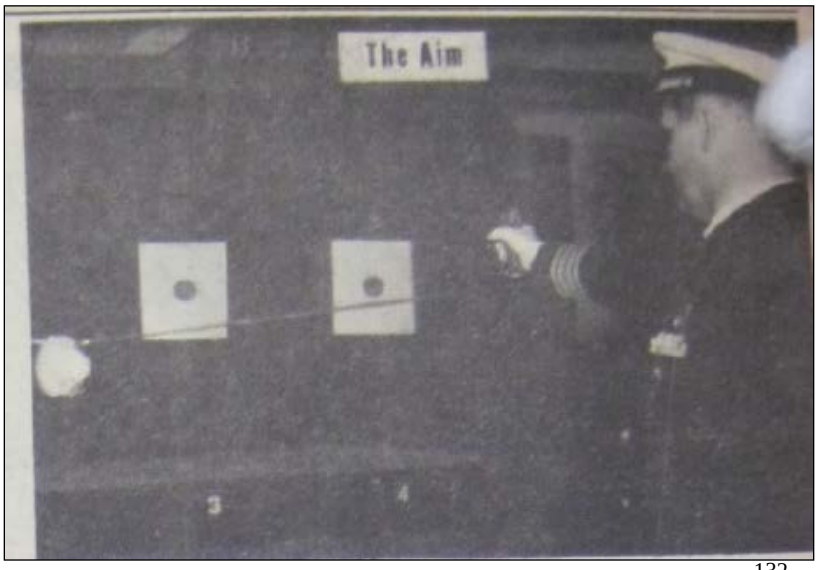


Figure 29 – Pistol Range Backstop November 1963[132]

4.2.1.7 Outdoor Small Arms Ranges

4.2.1.7.1 Gun Test Backstop (Firing-in-Butt)

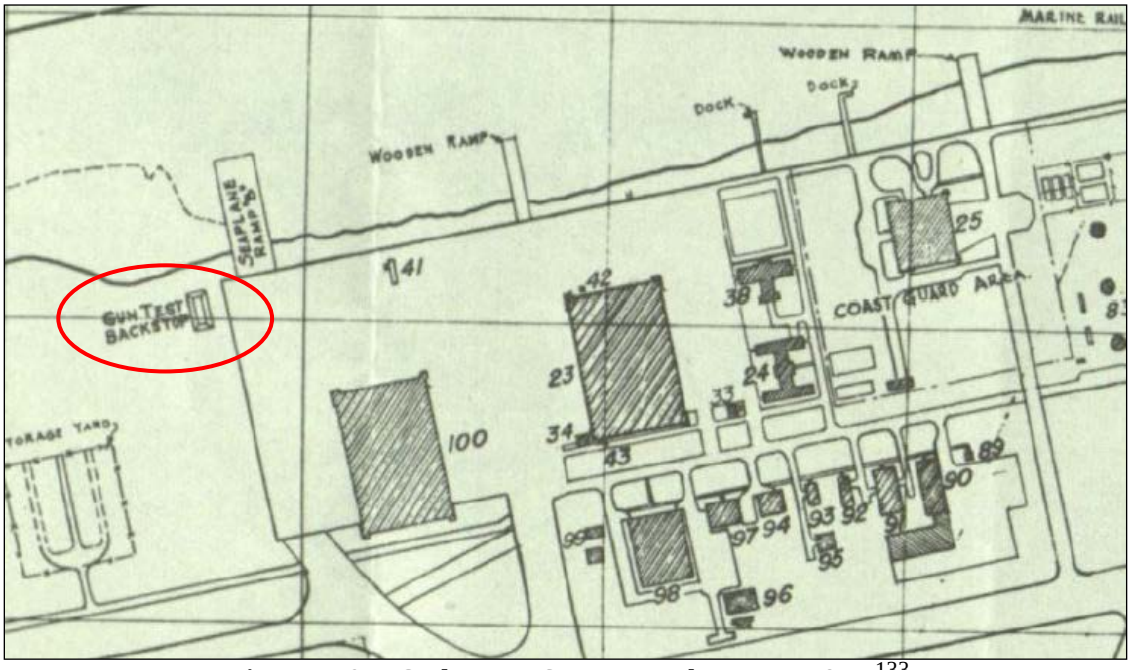


Figure 30 – Ordnance Structures by June 1944[133]

By June 1942 NAS NY units engaged in equipping newly manufactured aircraft for delivery to the Fleet. This work included the installation, boresighting, and testing of .30 and .50 caliber guns. An ammunition estimate for approximately six months included 80,000 rounds of .50 caliber machine gun ammunition and 15,000 rounds of .30 caliber machine gun ammunition.[134] The Gun Test Backstop first appears on a June 1943 base

map and it continues to be depicted on maps through 1947. The firing-in-butt's location at the edge of the airfield apron indicates a northerly direction of fire. The butt was apparently removed by 1948 as it is no longer depicted on base layout maps.[135] The approximate former location butt is currently covered with pavement and no evidence of the backstop currently remains at the site.

4.2.1.7.2 1940s Small Arms Ranges

The Navy began considering plans for a rifle and pistol range by October 1941, but the ranges do not appear on maps for several years.[136] By 30 June 1944, Building 105, shotgun range house, appears on installation maps and by June 1945 the pistol range and skeet and trap ranges are depicted (see following figure).[137]

Figure 31 – Pistol Range and Skeet and Trap Ranges 30 June 1945[138]

In June 1942 gunnery training was conducted at Floyd Bennett Field. The free gunnery training program consisted of one week instruction in disassembly and assembly, malfunctions and stoppages of .30 and .50 caliber machine guns, sighting theory, range and speed estimation, skeet shooting, and firing of machine guns at fixed and moving targets. Ostensibly, the skeet shooting occurred in the area depicted in the figure above even though the small arms ranges did not appear on maps until later. Shotgun ranges were constructed on Floyd Bennett Field but a small moving target range was set up on the beach at Fort Tilden (FUDS# C02NY0016). The target range at Fort Tilden proved to

be impractical with drifting sand covering the track and necessitating daily excavation. The Navy substituted the training using fixed and semi-fixed targets with some firing at free balloons.[139] During February 1943 the Bureau of Aeronautics training section consolidated the synthetic and the free gunnery training into a more satisfactory curriculum. Additional personnel supplemented the training staff and were available to provide training to more units attached to Floyd Bennett Field. Various fleet units including fleet air wings and air crews of six naval ships of battleship and cruiser type used this training activity for refresher courses for their aviation personnel. The Coast Guard personnel stationed at Floyd Bennett used these ranges for training their personnel as did the Marine detachment of officers and enlisted personnel from the Brooklyn Navy Yard.[140] New trap shooting equipment was requested during January 1945 to replace equipment in constant use in the aviation free gunnery training program.[141] Sometime between July and September 1947, officers and men from the USS Phillipine Sea used the rifle and pistol range for qualification tests.[142] In June 1948, the Chief of Naval Operations listed Floyd Bennett Field's ranges as available to Navy vessels for firing. The pistol range had nine points for firing at 25 and 50 yards and could accommodate 20-30 men with messing facilities. The rifle range consisted of nine firing points at 100, 150, and 200 yards.[143] The location of the rifle firing points is not depicted on any available maps. However, based on the rifle and pistol ranges both having nine firing points, it appears possible that the Navy used the same range for both rifle and pistol firing.

The pistol and skeet ranges continued to appear on maps through 1951. Sometime prior to 1953, maps indicate a runway extension paving over portions of the ranges.

Currently, portions of the skeet and trap shooting houses are paved over by a runway extension and remainders of the skeet and trap shooting range and the pistol ranges are covered with dense vegetation.

4.2.1.7.3 1950s Small Arms Ranges

Due to runway extension in 1951 paving over the 1940s pistol and skeet ranges, the Navy located a new "proposed pistol range" complex to the northeast (see following figure).[144]

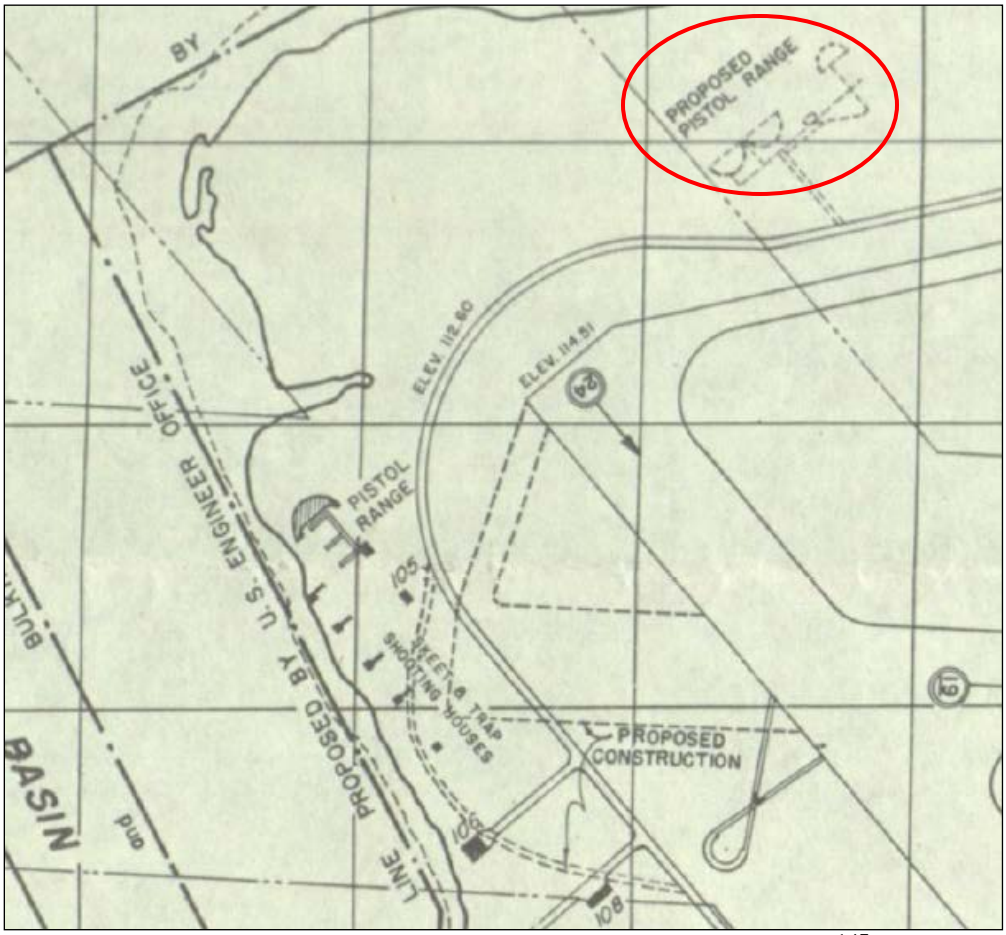


Figure 32 – Relocation of Pistol Range June 1951[145]

By June 1953 the Navy constructed a new skeet and pistol range complex northeast of the original location, including: (see following figure):

133 Skeet Range House
136 Skeet House High
137 Skeet House High and Low
138 Skeet House Low

Figure 33 – Skeet Range and Support Buildings June 1953[146]

Within a few years use of the pistol range ended due to the fact that the backstop was located against the bay and the range posed a safety hazard to boats. 1954 naval instruction required all station personnel be checked out on small arms. Floyd Bennett Field personnel assigned to armed sentry duty were required to maintain proficiency and conducted annual qualification and training at the Fort Tilden pistol range, approximately three miles away. New construction activities at Fort Tilden forced the pistol range there to close. By July 1956 the Commanding Officer of NAS NY requested modifications to the outdoor pistol range at NAS NY since no other pistol range was available within a reasonable traveling distance.[147]

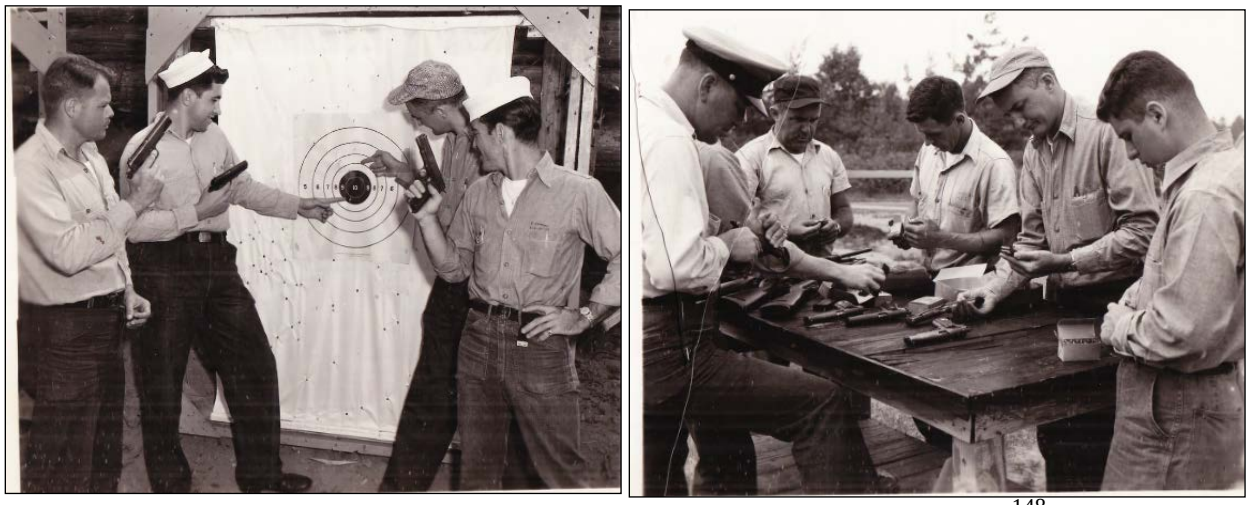


Figure 34 – Activities at Small Arms Range 21 July 1956[148]

A 1 March 1957 Public Works Maintenance and Repair Report for NAS NY lists a project description for construction of an earthen embankment 113 foot wide by 30 foot tall, and 100 foot in length at the outdoor pistol range (see following figure). This embankment would meet the minimum standard in conformance with safety requirements.[149]

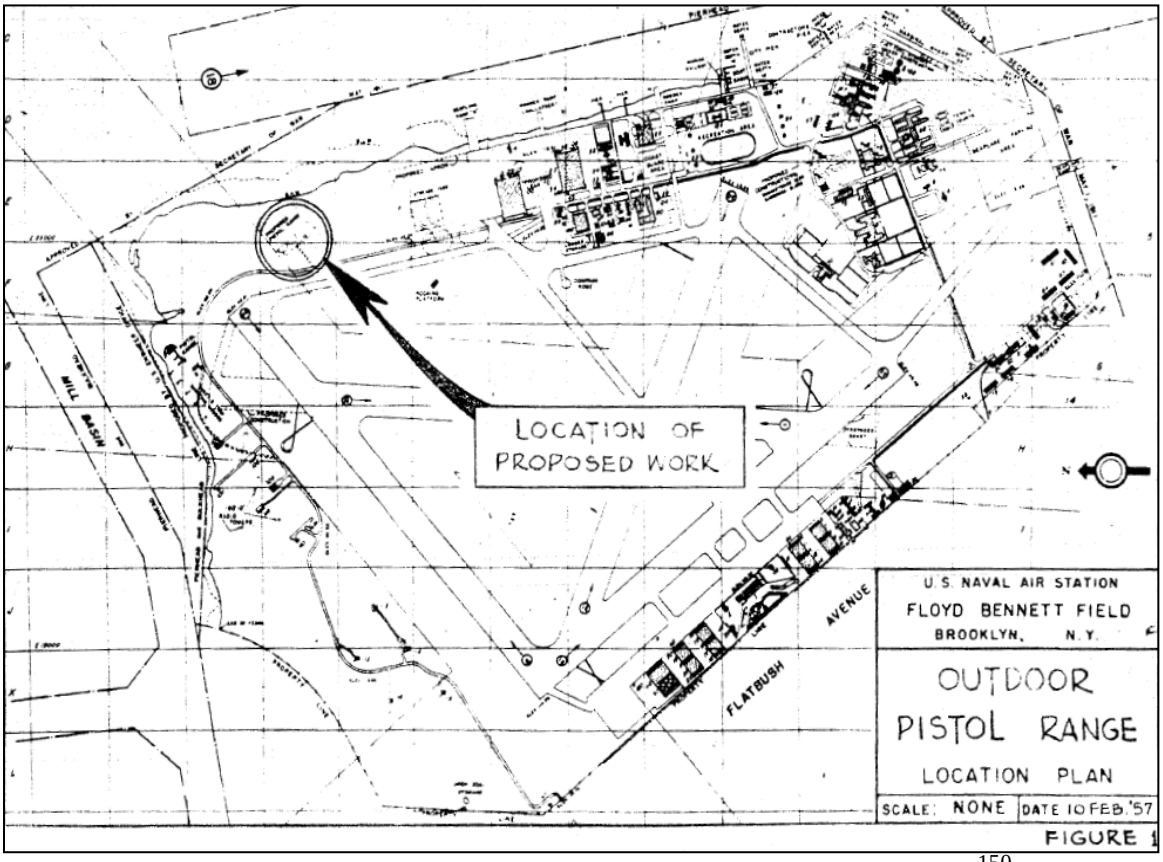


Figure 35 – Proposed Outdoor Pistol Range February 1957[150]

In September 1969, the base newspaper, described a new trap shooting range open at Floyd Bennett Field. The range was "*located to the rear of the fuel area at the approach end of runway 24*". Site plans do not delineate the trap range, although the description places it in the vicinity of the pistol and skeet ranges used in the 1950s (see following figure).[151]

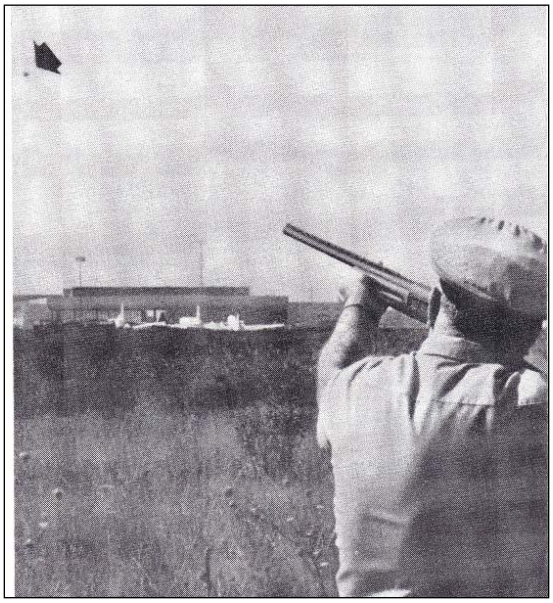


Figure 36 – Trap Shooting Range September 1969[152]

The range could accommodate five shooters at a time using 12 gauge shotguns supplied by Special Services. The arrow located at the top left of the above photo shows a clay target in the air.[153] Note the vicinity of aircraft in background.

4.2.1.8 ARADCOM 90mm Anti-Aircraft Emplacements

On 31 October 1952 the Department of the Navy granted a use permit (NOY(R)-46946) for 5.5 acres for the establishment of a 90mm anti-aircraft artillery battery on the southern edge of the property.[154]

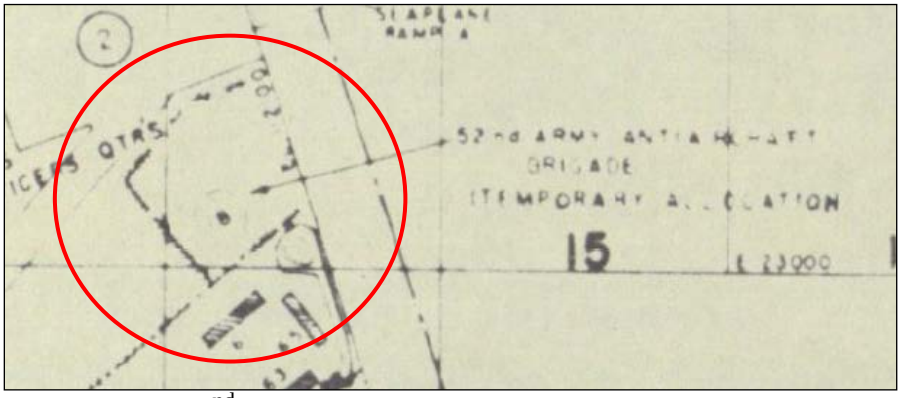


Figure 37 – 52nd Army Anti-Aircraft Brigade Location 30 June 1953[155]

The 1954 aerial photo above depicts four different anti-aircraft emplacements (see following figure).

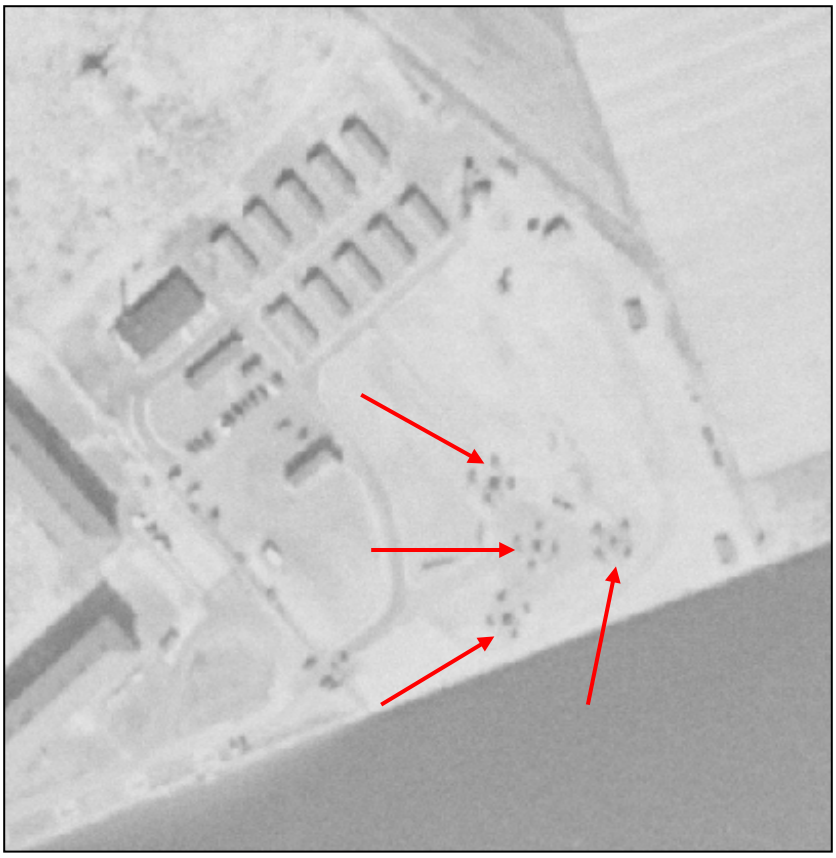


Figure 38 – Aerial Photo Anti Aircraft Emplacements February 1954[156]

In 26 March 1954 correspondence, the Bureau of Ordnance granted a waiver and authorized the storage of anti-aircraft ammunition for the artillery battery at NAS NY. The waiver conditions included keeping the amount of ready service ammunition to a minimum not to exceed 88 rounds per gun whenever the guns were not actually engaged. The ammunition would be protected in bunkers constructed of railroad ties and sandbags. The ammunition reserves consisting of 348 rounds would be stored in accordance with regulation. The waiver stipulated that the Navy's responsibility and liability for any casualties or accidents stemming from the movement, storage, or operations of the anti-aircraft battery would be limited to only those cases arising from conditions over which the Navy can exercise control or where negligence of Navy personnel is clearly proven.[157]

The use permit for the 90mm anti-aircraft artillery battery ended on 31 January 1958. This piece of property is currently part of the Marine Corps Reserve Training Center and therefore is not eligible under the FUDS program. [158]

4.2.1.9 Bombing Targets, Jamaica Bay

Pilots conducted bombing practice at Floyd Bennett Field; however, specific location information is limited. It is possible there were four different locations used for bombing that are outside of the main airfield or they may all be the same location with just slightly different names. As noted in Section 3.2.3 of this APA, these locations are outside the boundary of Floyd Bennett Field as addressed in the FDE and are not eligible to be addressed under this FUDS property.

The following paragraphs describe the types of ordnance used at the range (s) and any available details on the ranges.

The commandant's annual report of activities for July 1931 discusses an NRAB training program calling for gunnery and bombing practice.[159] The report does not give a location for the ranges used for this training. By 2 December 1931 the NRAB received the following ammunition:

12,000	rounds 30 cal ball ammunition fixed guns
8,000	rounds 30 cal ammunition free guns
18,000	30 cal metallic belt links
600	miniature bombs, Mk. IV
600	miniature practice bomb signals, Mk. IV
40	aerial targets, MK. IV[160]

Between July and September 1932, flyers at Floyd Bennett Field expended the following ammunition:

7,300	Cartridges, ball, 30 cal, Grade M1
5,600	Cartridges, ball, 30 cal, Grade A2
4,500	Cartridges, ball, 30 cal, tracer, Grade M1
1,560	Cartridges, dummy, 30 cal, Mod. 1906
572	Bombs, miniature practice, Mar III-I
572	Miniature practice bomb signals, IV
22	Targets, Mark IV
75	Targets, Mark III
10,000	Metallic belt links, cal. 30[161]

A 27 October 1932 NRAB report of 15 day active duty periods for Squadrons VN3RD3 and VN4RD4 states a bombing target located on **Center Island**, Jamaica Bay, approximately one mile from the field was used for bombing exercises. It further states that fixed and free gunnery dummy practice runs were conducted in the immediate vicinity of the base, though no actual location is given.[162]

Between October and December 1932, flyers at Floyd Bennett Field expended the following ammunition:

4,500	Cartridges, ball, 30 cal, tracer, Grade M-1
3,000	Metallic belt links, 30 cal
6,400	Cartridges, ball, 30 cal 1906, class A-2
7,200	Cartridges, 30 cal ball, type M1, class A1
3,640	Cartridges, 30 cal dummy, Mod 1906
1,500	Cartridges, 30 cal, tracer, Mod. 1917
71	Targets, Mark III
325	Bombs, miniature practice, Mark III Mod. X
325	Miniature practice bomb signals, Mark IV[163]

Between January and March 1933, flyers at Floyd Bennett Field expended the following ammunition:

1,500	Cartridges, ball, 30 cal Type M1, Class A1 Grade AC
2,000	Metallic belt links, 30 cal
1,000	Cartridges, 30 cal dummy, Mod 1906
20	Targets, aerial, Mark III, white
190	Bombs, miniature practice Mark III, Mod I
190	Miniature practice Bomb signals, Mark IV[164]

The 24 September 1935 report of training for Squadrons VN3RD3 and VN4RD3 stationed at NRAB and the 18 October 1935 report of training discuss different types of training including dive bombing and fixed and free gunnery for both for practice and record.[165] The reports do not describe the dive bombing location.

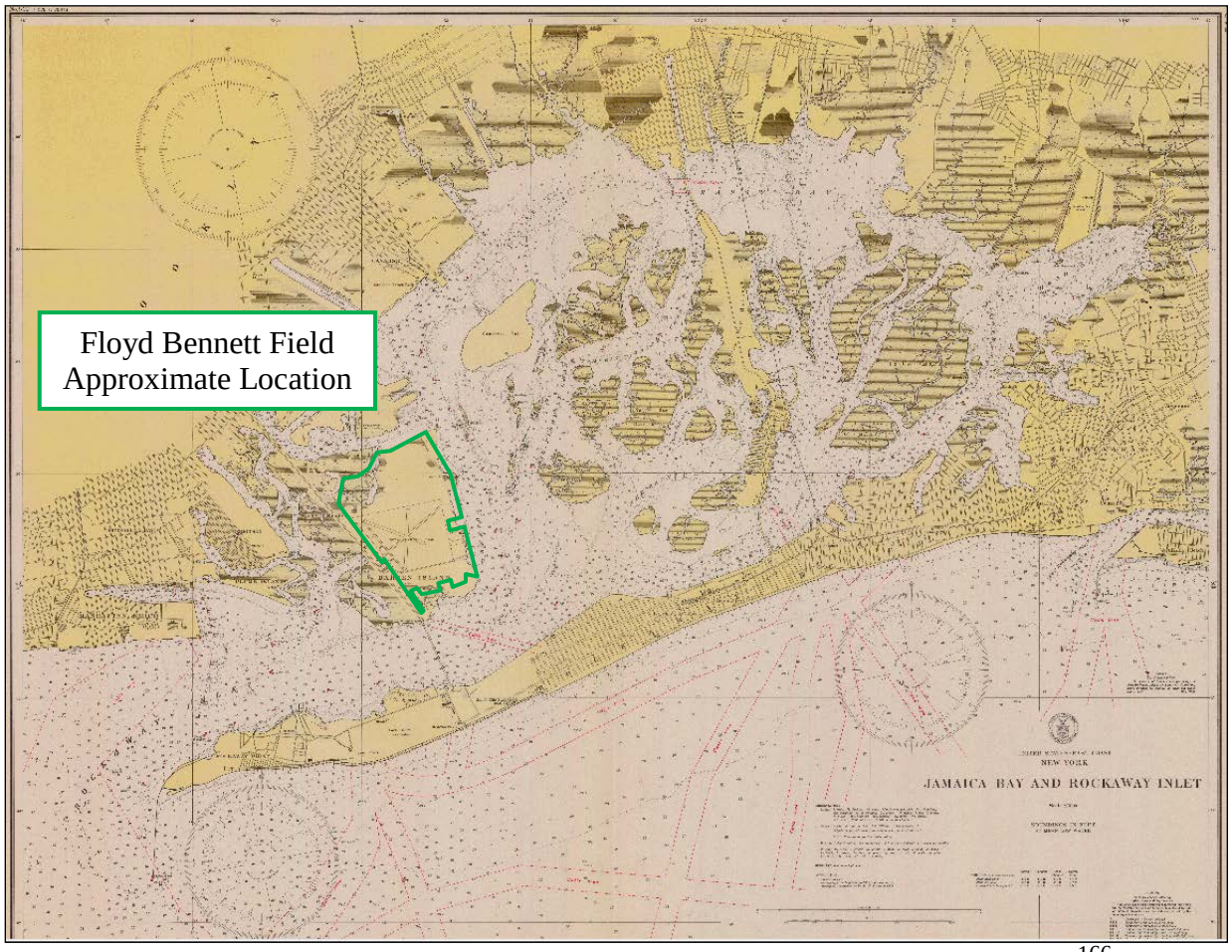


Figure 39 – Jamaica Bay & Rockaway Inlet Chart, 31 January 1940[166]

In 11 September 1937 correspondence, the Bureau of Air Commerce requests the location of the **Bombing Area** used by the NRAB. The letter requests a copy of the U.S. Coast and Geodetic Survey Chart No. 542 indicating the location of the bombing range.[167] The previous figure shows a Chart No. 542 approximately three years later than the date mentioned in the correspondence, but it does not depict a bombing area location or air-to-ground gunnery range. Between 1940 and 1945 two Danger Zones are denoted on Sectional Aeronautical Charts: one at the western end of Rockaway Beach and one at an island in Jamaica Bay (see following figure).[168]

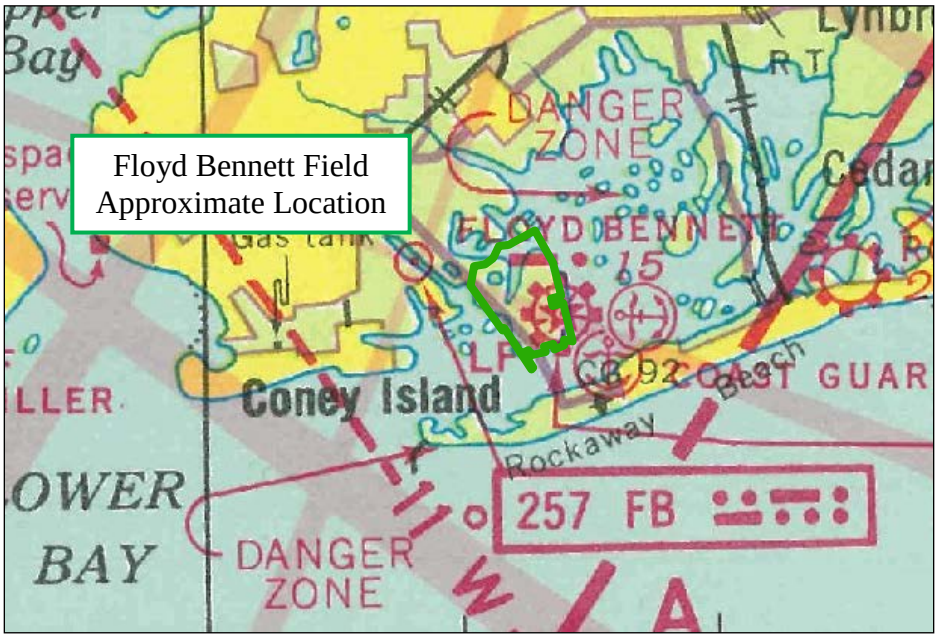


Figure 40 – Aeronautical Chart showing Danger Zone East and West of Floyd Bennett Field May 1940[169]

Available Bureau of Ordnance Shipment Orders provide an indication of possible ammunition used by NRAB Floyd Bennett Field between 1939 and 1942. In April 1939, requested items included:

3,050	Miniature Practice Bombs, MK V or V-1
3,050	Miniature Signal s, ML. IV
108	Cartridges, Very's (36 each red, green, white)[170]

In August 1940 NRAB Floyd Bennett Field requested the following items:

2,200	Miniature Practice Bombs, Mark V1
2,200	Signals, Miniature Practice Bomb, Mark IV[171]

In January 1941 an order included twenty-five Practice Bombs, 100 lb. MK. VII.[172]

A 19 December 1941 order included the following ordnance items:

2,100	Miniature practice bomb, Mk. 5 Mod. 1
1,338	Miniature practice bombs Mk. 5
3,618	Signals for miniature practice bombs, Mark 4
25	Aircraft practice bombs (water fillable 100 lb. dimensions) Mark 2
18	Aircraft parachute flares, Mark 4 Mo. 1
15	Wing tip flares, Mark 2[173]

A 3 March 1942 order lists 24 Aircraft demolition bombs, 500 lb, Mark 12 Mod. 1 loaded

TNT-A complete with tails, crates, auxiliary boosters, arming wires and safety clips.[174]

On 5 January 1942, the Commanding Officer of NAS NY requested permission from the Commissioner of the Department of Docks Pier A for use of an area known as **Yellow Bar Hassock,** Jamaica Bay, for non-explosive bombing practice. This area was waterfront property under the jurisdiction of the City of New York Department of Docks, who granted NAS NY use of it on 16 January 1942. The Commissioner of Docks suggested the NAS NY inform the police department at least twenty-fours in advance of the date or dates of use for bombing practice.[175] In August 1942 correspondence from a Ruffle Bar Island home owner discusses restrictions placed on navigable waters in the area east of the NAS. The Navy responded by stating it had no intention of using Ruffle Bar Island as a practice bombing area at the present time, but a Naval bombing range was in use about 600 yards to the eastward of the eastern most point of this island.[176]

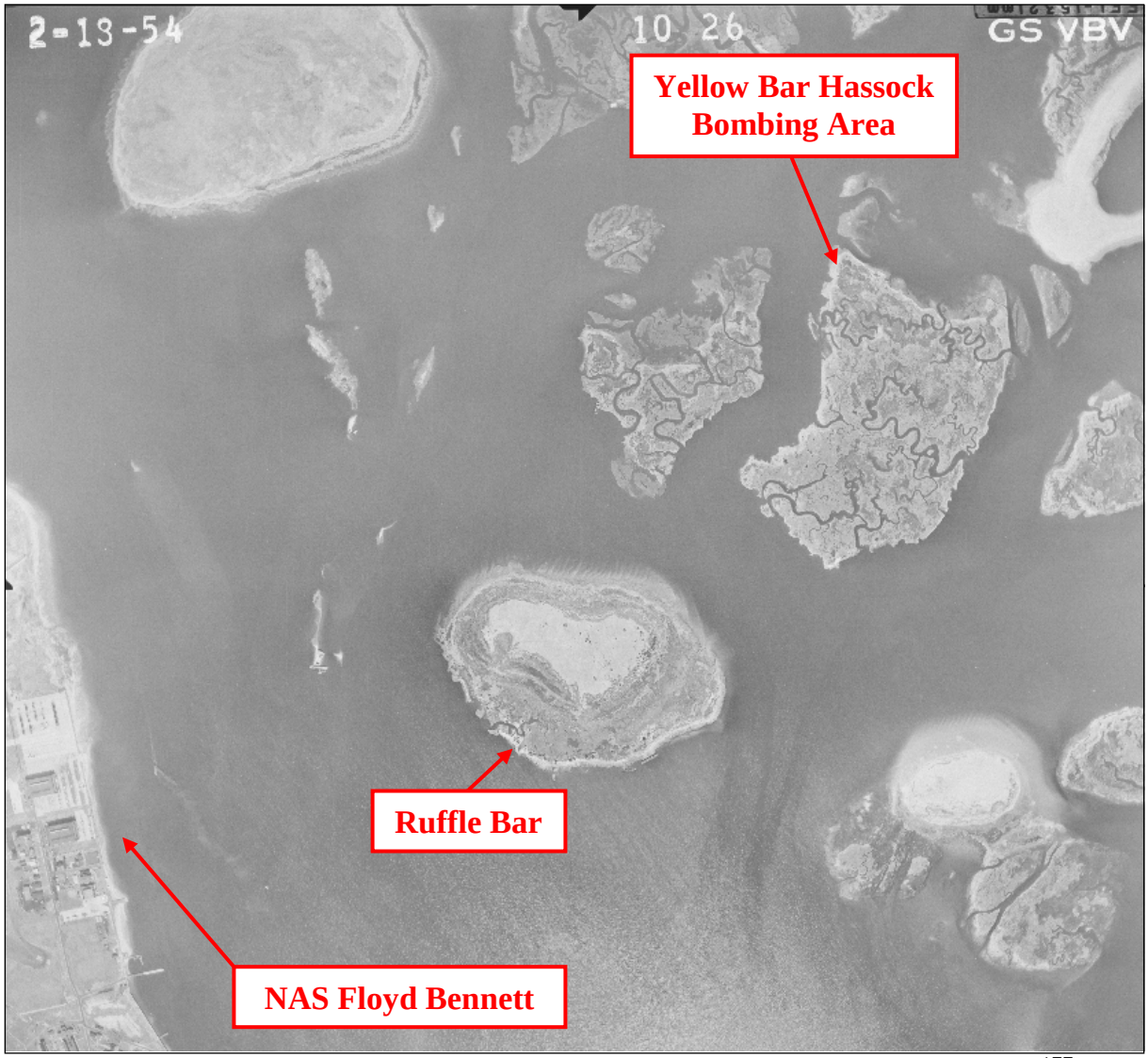


Figure 41 – Aerial photo east of Floyd Bennett Field 18 February 1954[177]

Interdepartmental Air Traffic Control Board notes from 27 October 1942 state that no danger areas would be established at "Jamaica Bay, New York" for bombing practice wherein such bombing activities will be intermittent or of a temporary nature.[178]

During February 1943 NAS Floyd Bennett informed the Commander of the Atlantic Fleet of the types of gunnery training and other facilities available at the station. The facilities included "*an armored target boat* […] *and a glide bombing target* […] *placed in a marsh to the east of this station.*"[179] In March of 1944, Headquarters Third Naval District listed the "Jamaica Bay Bombing Range" as a necessary restricted area and stated that it should be retained.[180] None of the information obtained describes the actual location for bombing practice on Yellow Bar Hassock.

In June 1944 the Air Force, U.S. Atlantic Fleet discussed the need to secure a "new target" area suitable for low level daylight practice bombing with single and multi-engine aircraft not available for use on the present target area located in **Joce March**, Jamaica Bay, near the station.[181] It is unknown if the Joce March target area is the same as the Yellow Bar Hassock area. The Danger Zones depicted on the Sectional Aeronautical Maps are no longer depicted on 1947 and later charts, indicating an end of use.

4.2.1.10 Summary of CW Activities

Information regarding the CW activities at the former Floyd Bennett Field is limited. The types of CW items and equipment procured imply that training activities occurred there; however, none of the documentation or maps indicate where that training took place. As typical with most World War II installations, basic instruction in procedures for donning protective gas masks, identification of CW agents, and decontamination of personnel and equipment occurred based on periodic CW equipment inventories. None of the documents obtained indicate a gas chamber nor do they include tear gas typically used for mask test fits and confidence tests. Reviewed site maps did not locate a toxic gas yard or a gas obstacle course, though they were a typical part of CW training during the early 1940s. The only confirmed items with CWM are the CAIS Sniff Sets, though Floyd Bennett Field also had significant amounts of decontaminating agents.[182]

Quarterly inventories of chemical warfare equipment were reported to the Commandant of the Third Naval District. The following paragraphs list chemical warfare items and equipment at Floyd Bennett Field.

The Chemical Defense Inventory of 1 May 1943 lists the following items:

1	Sniff Sets
1250	NC Gas Masks
904	MKI, MKII Gas Masks
303	Suits of Protective Clothing
6,000 lbs	Chloride of Lime

600 lbs	RH-195[i]
6,000 lbs	Tetrachlorethane
212	Protective Woolen Gloves
1	Power Sprayer
45	Detector or Crayon
424	Protective Socks
1	Repair Kit
45	Detector Paint[183]

One month later, 30 June 1943, the chemical inventory remains similar but with an increased number of gas masks:

1	Sniff Sets
1,509	NC Gas Masks
904	MKI, MKII Gas Masks
303	Suits of Protective Clothing
6,000 lbs	Chloride of Lime
600 lbs	RH-195
6,000 lbs	Tetrachlorethane
212	Protective Woolen Gloves
1	Power Sprayer
45	Detector or Crayon
424	Protective Socks
1	Repair Kit
45	Detector Paint[184]

The quarterly inventory of chemical warfare equipment as of 31 December 1943includes the following:

920	Gas Mask ND-Mark I-II
1,510	Gas Mask NC-Mark I Standard
1	Sniff Set
303	Suits Protective Clothing
12	Pairs Protective Rubber Gloves
208	Pairs Protective Woolen Gloves
324	Pairs Protective Socks
300 lbs	Chloride of Lime
0 lbs	RH-195
0 lbs	Tetrachlorethane

[i] RH-195 (1,3 dichloro-5,5-dimethylhydantoin or M4 Decontaminating Agent) was mixed with tetrachloroethane to make Decontaminating Agent, Non-Corrosive (DANC) (see Section 5.3.2.2).

1	Vesicant Detector Kit
1	Power Sprayer
1	Repair Kit[185]

As of 30 September 1944, the quarterly inventory of chemical warfare equipment was as follows:

1,509	Gas Mask NC Mark I (Standard)
1	Sniff Set
12	Protective Rubber Gloves
1	Repair Kit[186]

The cover letter to the inventory states "discrepancies existing between this inventory and the last survey submitted, dated 31 December 1943, are due to material which has been lost or surveyed and expended…"[187]

The quarterly inventory of chemical warfare equipment for both 30 December 1944 and 31 March 1945 includes the following items:

1,509	Gas Masks NC Mark I
1	Sniff Set
12	Protective Rubber Gloves
1	Repair Kit[188]

In March 1953, as part of the chemical or biological warfare defense plan, the 2230th Air Force Reserve Flying Training Center personnel requested materials to respond with during a station alert, including:

2	Decontaminating apparatus, portable, 3 gallon, M-1
1	Kit chemical agent detector, M9A2
1	Kit detection "G" agent, food, M-2
1	Kit chemical agent, detection water, M-2
1	Set, gas toxic M-1
1	Set, gas identification, instructional, M-1[189]

There is no evidence that this material was ever received or used at Floyd Bennett Field.

4.2.1.11 Certificates of Clearance

This investigation did not reveal any certificates of ordnance clearance, decontamination or dedudding associated with the former Floyd Bennett Field.

4.2.1.12 1940s Navy Bomb Unit Incidents

On 27 August 1942 an airplane accident occurred when a seaplane took off from Floyd Bennett Field and hit an unlit buoy. Two 325 pound Mark 17 depth bombs, fully armed, were wrenched from the racks into fourteen feet of water. Personnel requested guidance on how to proceed with salvage operations. Approximately one month later no guidance had been given for their removal.[190] No additional documentation obtained describes whether the depth charges were removed or left in place.

During 1944 Floyd Bennett Field personnel requested assistance from members of the 3rd Naval District Bomb Disposal Unit in breaking up discarded or wrecked aircraft into suitable sections in order to load the pieces onto standard truck beds. Parts of six or seven fighter airplanes in the plane cemetery (location unknown) were slated for removal. On 2 August 1945 Bomb Disposal personnel partially demolished one wreck, but work was hampered due to rain. Additional Engineer's Special Blasting caps were expected to arrive by 11 August, at which time work would continue. Safety measures included clearing the area of personnel while blasting and maintenance of fire-fighting equipment were carried out. No more than five pounds of high explosives are set off at a time.[191]

The District Ordnance Officer requested the 3rd Naval District Bomb Disposal Unit remove six rounds of ammunition from a 40mm twin gun mount which had been raised by salvage crews from the sunken USS Turner. One round was found on the injection track and two rounds were found in the magazine of each of the two guns. This activity occurred on 26 August 1944 at the Marginal Pier at Floyd Bennett Field. The Bomb Disposal Unit removed and disposed of the rounds.[192]

4.2.1.13 EOD Incidents

No recent Explosive Ordnance Disposal (EOD) incidents associated with the subject FUDS were identified.

4.3 MAP ANALYSIS

The investigation team located a large number of site-specific layout plans for the former Floyd Bennett Field; however, the relevant information from those maps and plans are discussed elsewhere in this APA.

4.4 AERIAL PHOTOGRAPHIC INTERPRETATION

4.4.1 General Methodology

Government and contractor personnel conducted an aerial photography database search (included in Appendix A.2-Aerial Photography Repositories). The aerial photography retrieved covered the former Floyd Bennett Field during and following military use. The

imagery acquired is in photographic print format. The analyst performed the interpretation using the following source materials:

TABLE 4.4
Aerial Photography Details

Photograph Date	Approximate Scale
4 January 1954	1:20,000
18 February 1954	1:20,000
22 February 1966	1:24,000
3 December1966	1:12,000
10 April1975	1:18,000
2013	NA

NOTE: For complete list of available imagery please see Appendix A.2.

The analyst delineated imagery containing important areas on hard copy plots and digitized it using ESRI (ARC) software. The digitized features overlay scanned aerial photography, resulting in the final Plates 3, 4, 5, and 6. The analysis involved using stereo viewing of photography, which allows more accurate identifications than monoscopic interpretations. The resolution and scale of the imagery limited the identification of features discussed in this study. The analyst uses the word "probable" when discussing features for which identification is reasonably accurate. The analyst uses the term "possible" when identification is not positive, but the object/area matches known features/locations on other sources. Analysis of the aerial photographs referenced the site maps which are discussed in relevant sections throughout this APA. Feature descriptions referenced in the sub-paragraphs below refer to the feature annotated aerial photography plates. The sub-paragraphs below describe the relevant features identified on the imagery.

The measurements of features in the aerial photo analysis are ALL approximations, whether specifically stated or not. Measurements from the photo prints are converted to distances based on the stated accuracy of the imagery, which varies between frames and flight lines. Another factor affecting the measurements of features is the scale of the imagery. At the higher scales, the features being measured are smaller and more difficult to measure. The interpretation measurements are estimated to be within approximately 20% of the actual values.

NOTE: The locations for the following Areas of Interest/Features are primarily derived from installation layout maps from 1945, 1951, and 1953.[193] Other items were identified based on aerial photo analysis. Also note that hard copy stereo imagery was not available to do a true stereo analysis.

4.4.2 Features of Interest

The following image shows the site wide locations of features identified on layout maps. The locations of numbered features are identified in subsequent sections as outlined in Table 4.4.2.

Figure 42 – Site-wide Features of Interest Locations on 2013 Aerial Imagery

TABLE 4.4.2 Floyd Bennett Field – Site-wide Features Based on Historical Records		
FEATURE NO.	**FEATURE DESCRIPTION**	**FOCUS AREA SECTION**
1	Building 105 (3 Shotgun Range Houses)	4.4.2.1
2	Building 106 (Inert Storage)	
3	Building 107 (Smoke Drum Storage)	
4	Building 108 (S.A. Pyrotechnics)	
5	Building 109 (Practice Bomb Storage)	
6	Building 110 (Fuse and Detonators)	
7	Building 111 (Fuse and Detonators)	
8	Building 112 (H.E. Magazine)	4.4.2.2
9	Building 113 (H.E. Magazine)	
10	Building 114 (H.E. Magazine)	
11	Building 115 (H.E. Magazine)	
12	Building 116 (Warhead)	
13	Building 41 (Ammunition Storage)	4.4.2.3
14	Building 42 (Ready Ammunition Locker)	
15	Building 43 (Ammunition Storage)	
16	Building 44 (Ready Ammunition Locker)	4.4.2.4
17	Building 45 (Ready Ammunition Locker)	
18	Building 93 (Ordnance Shop)	4.4.2.3
19	Pistol Range	4.4.2.5
20	Berm	
21	Proposed Skeet Range	4.4.2.6
22	Proposed Skeet Range	
23	Proposed Pistol Range	
24	AAA Site (90mm Gun Emplacements) 24A, 24B, 24C, and 24D	4.4.2.7
25	Magazine	4.4.2.3
26	Magazine	
27	Ammo Storage Locker	
28	Stationary Aircraft Gun Test Backstop	
29	Coast Guard Ammo Locker	
30	Torpedo Storage and Pyrotechnic Ready Locker	
31	Ready Ammunition Storage Locker Bldg 168	4.4.2.6
32	Ready Ammunition Storage Locker Bldg 169	
33	Hangar 9 (Possible Indoor Small Arms Range)	4.4.2.4
34	Hangar 9 (Possible Indoor Small Arms Range)	
35	Indoor Rifle Range Bldg 72	4.4.2.8
36	Pistol Range (Hangar 4/Bldg 12)	4.4.2.4

4.4.2.1 Pistol and Skeet Range and Storage Buildings

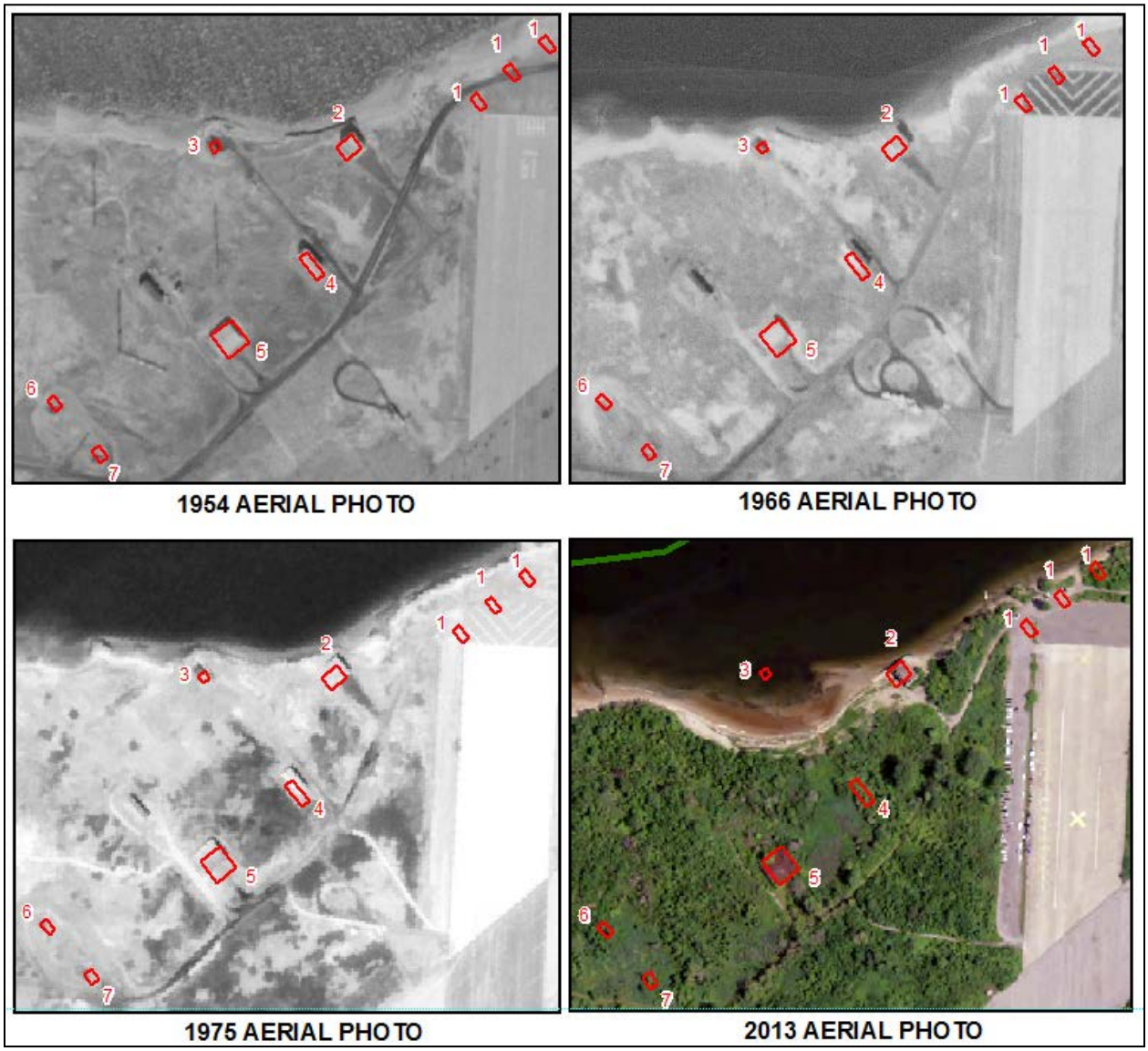


Figure 43 – Features of Interest Locations

Located along the northeast portion of the property were several features/buildings described below. These items were based on the map 1945-06-30 NAS NY Showing Conds NARACP_RG72_E62B(1946)_B397.pdf

The map shows that there were 3 Shotgun Range Houses (Building 105) for the Pistol and Skeet Ranges (**1**); these structures were not identified on the1954 aerial imagery. The 1966 imagery shows that the runway had been extended and the location of two of the three buildings would have been covered with concrete. There is no evidence of the 3rd northeastern most building present on the 1966, 1975 or 2013 imagery. The Inert Storage (Building 106) (**2**) was identified on the 1954 aerial photo. It measured approximately 50 feet by 70 feet. The structure remained there through 2013. The

Smoke Drum Storage (Building 107) (**3**) was indentified on the 1954 imagery and measured approximately 30 feet by 45 feet. The building remained through 1966 and 1975. Erosion of the shoreline eliminated the building by 2013. The S.A. Pyrotechnics (Building 108) (**4**) was indentified on the 1954 imagery and measured approximately 90 feet by 45 feet. The building remained through 1966 and 1975. By 2013 the building had been razed and the area is now covered with vegetation. The Practice Bomb Storage (Building 109) (**5**) was indentified on the 1954 imagery and measured approximately 80' X 95'. The building remained through 1966, 1975 and 2013. The Fuze and Detonators buildings (Building 110) (**6**) and (Building 111) (7) were indentified on the 1954 imagery. Each building measured approximately 40 feet by 40 feet. The buildings remained through 1966 and 1975. By 2013 the buildings had been razed and the area is now covered with vegetation.

4.4.2.2 Magazine Area

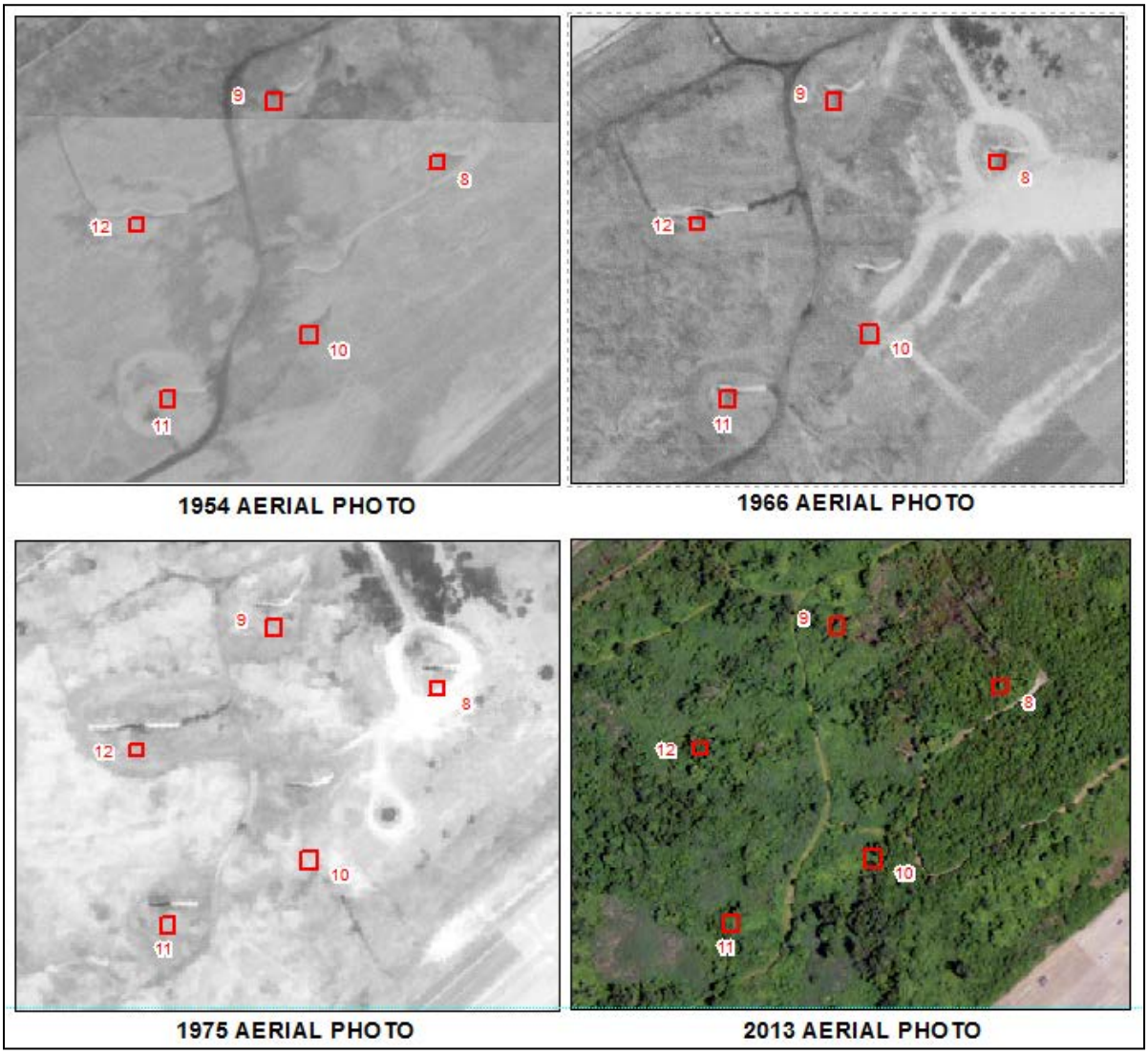


Figure 44 – Features of Interest Locations

The above four years of imagery show the overall general location of the Magazine Area located in the northern portion of the property. The following buildings were depicted on the 1945 map: Building 112 (H.E. Magazine) (**8**), Building 113 (H.E. Magazine) (**9**), Building 114 (H.E. Magazine) (**10**), Building 115 (H.E. Magazine) (**11**), Building 116 (Warhead) (**12**). The 1954 imagery shows all five buildings and each appears to be covered with mounded dirt. There do not appear to be any significant changes in the 1966 and 1975 imagery. The 2013 imagery does not show that the buildings are visible. Each is covered in dense vegetation.

4.4.2.3 Buildings and Gun Test Backstop (East Side)

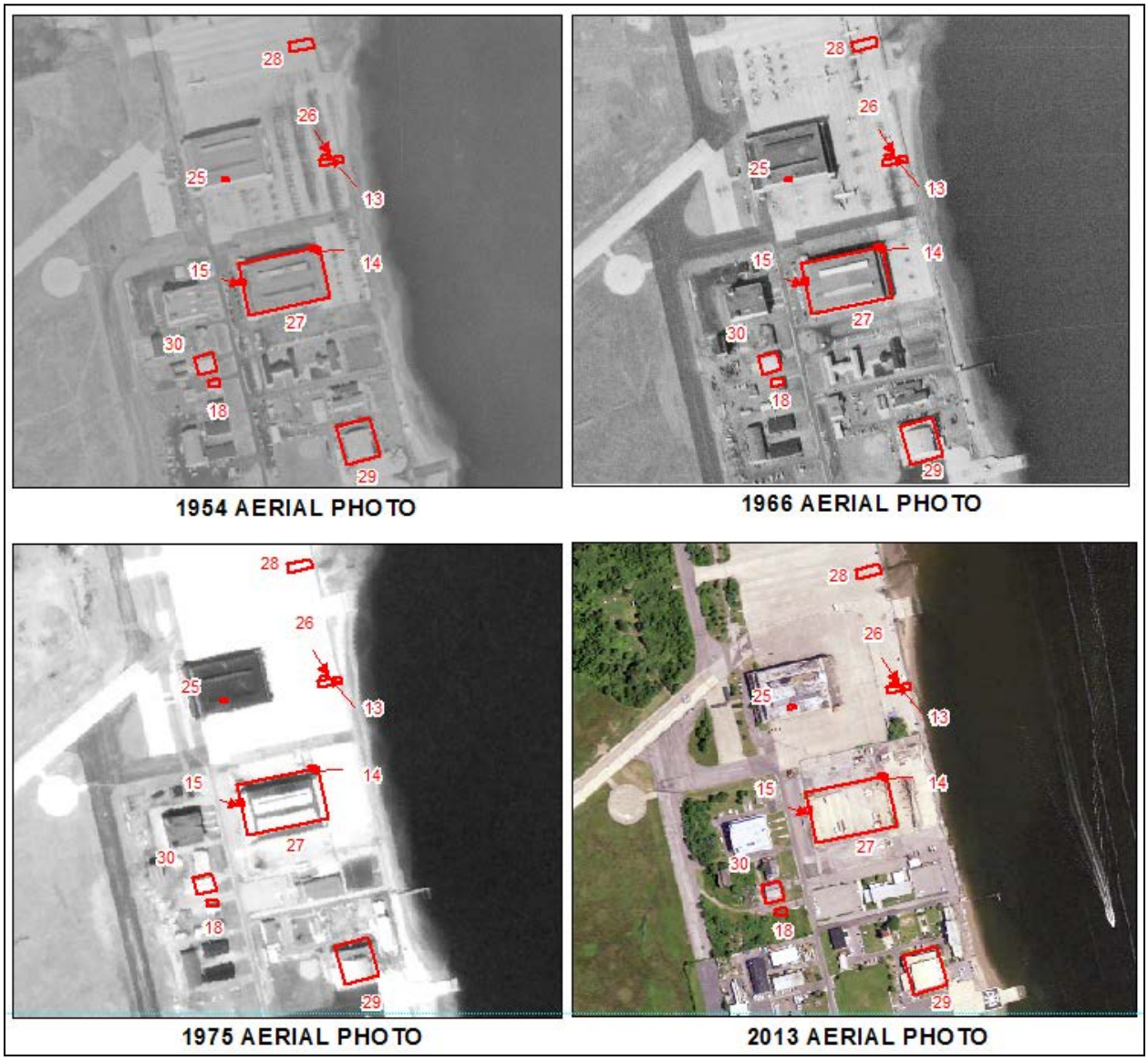


Figure 45 – Features of Interest Locations

The above four years of imagery are along the east side of the property at Jamaica Bay. This area primarily consists of buildings and a potential Gun Backstop (**28**). Building 41 (Ammunition Storage) (**13**) is identified on the 1954 aerial imagery and measures 60 feet by 25 feet. By 1966 the building had been razed and covered in concrete. No changes were identified on the 1975 or 2013 imagery. Building 42 (Ammunition Storage) (**14**) cannot be positively identified on the 1954 aerial imagery. The 1966, 1975 and 2013 imagery do not show any evidence of the building. Building 43 (Ammunition Storage) (**15**) does appear on 1954, 1966, and 1975 aerial imagery. By 2013 the building had been razed. Building 93 (Ordnance Shop) (**18**) is identified on the 1954 aerial imagery. The building measures 50 feet by 30 feet. The 1966 and 1975 imagery shows that the building is still evident, but by 2013, it has been razed. The map labeled 1943-06-30 NAS NY Showing Conditions on.pdf shows that there was a Gun Backstop (**28**) constructed; however, on the 1954 imagery there is no indication that it was constructed. The 1966, 1975 and 2013 imagery does not show any evidence of it. There are two Magazines (**25** & **26**) depicted on map 1940-06-30 Showing Conditions on.pdf. These magazines were not identified on the 1954 or any subsequent imagery. Feature **(27)** Ammo Storage Lockers (Within Hangar) is not identified since it is located within the Hangar Building. The Hangar itself is identified and is seen on the 1954, 1966, and 1975 imagery, but had been razed by 2013. The Coast Guard Ammo Locker (**29**) and Torpedo Storage and Pyrotechnic Ready Locker (**30**) are identified on the 1954 imagery as well as the 1966 1975 and 2013 imagery. The Coast Guard Ammo Locker (**29**) measures approximately 200 feet by 170 feet and the Torpedo Storage and Pyrotechnic Ready Lockers (**30**) measures approximately 90 feet by 90 feet.

4.4.2.4 Ready Ammunition Lockers

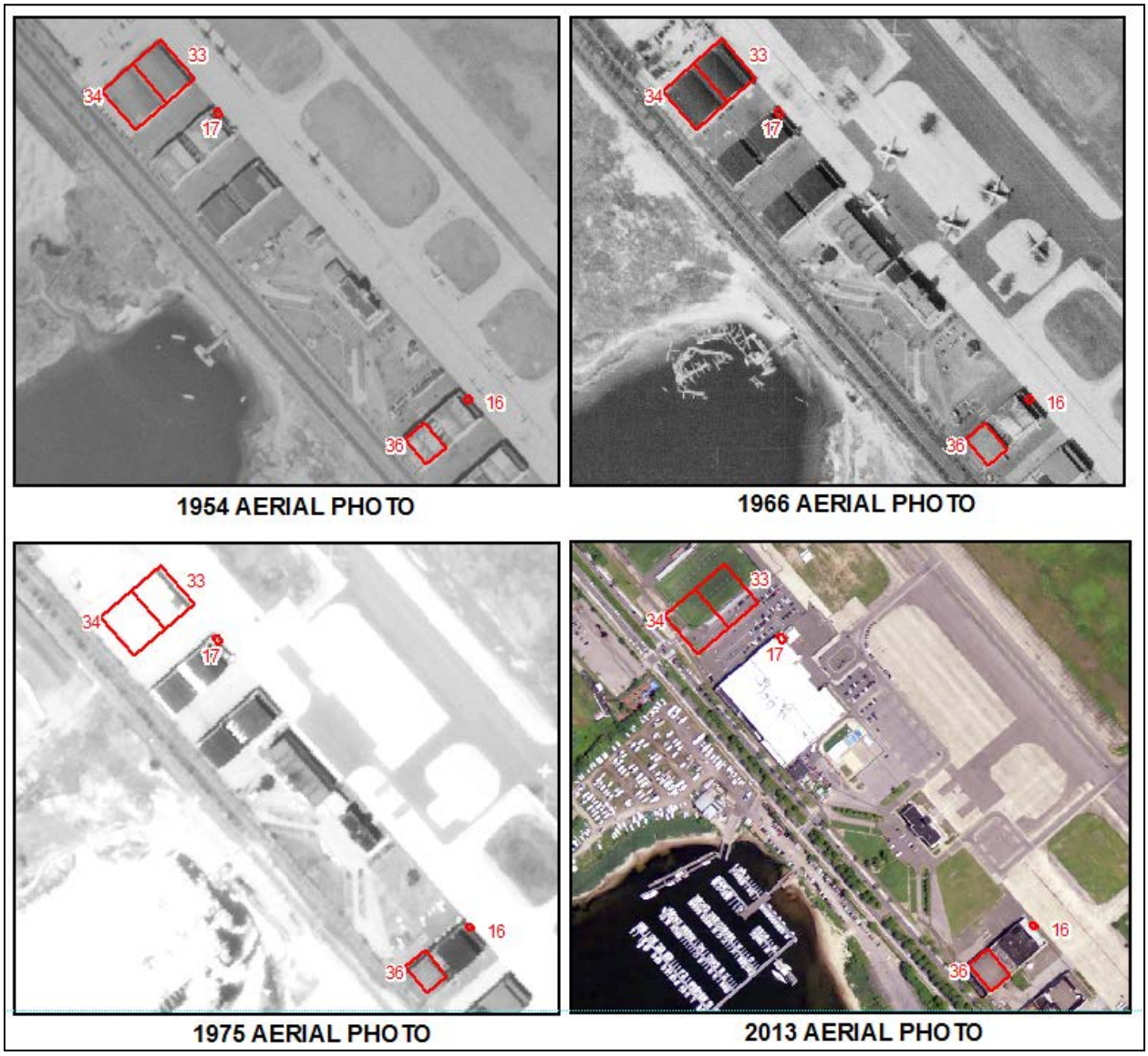


Figure 46 – Features of Interest Locations

The 1945 map shows that there were two Ready Ammunition Lockers (Building 44 (Ready Ammunition Locker) (**16**) and Building 45 (Ready Ammunition Locker) (**17**). These buildings are located along the western portion of the property. The 1954 imagery does show possible evidence of both buildings, but the buildings next to them make them hard to distinguish. Neither building is seen on the 1966, 1975 or 2013 imagery; however, in 2013 a large building covers Building 45 (Ready Ammunition Locker) (**17**). Also identified is Hangars 9 and 10 (**33 and 34**) both containing a Possible Indoor Bore Sight Range & Target Butts and Hangar 4/Bldg 13 (**36**) Pistol Range. Each of these 3 buildings was identified on the 1954, 1966, and 1975 imagery but all were razed prior to 2013.

4.4.2.5 Pistol Range

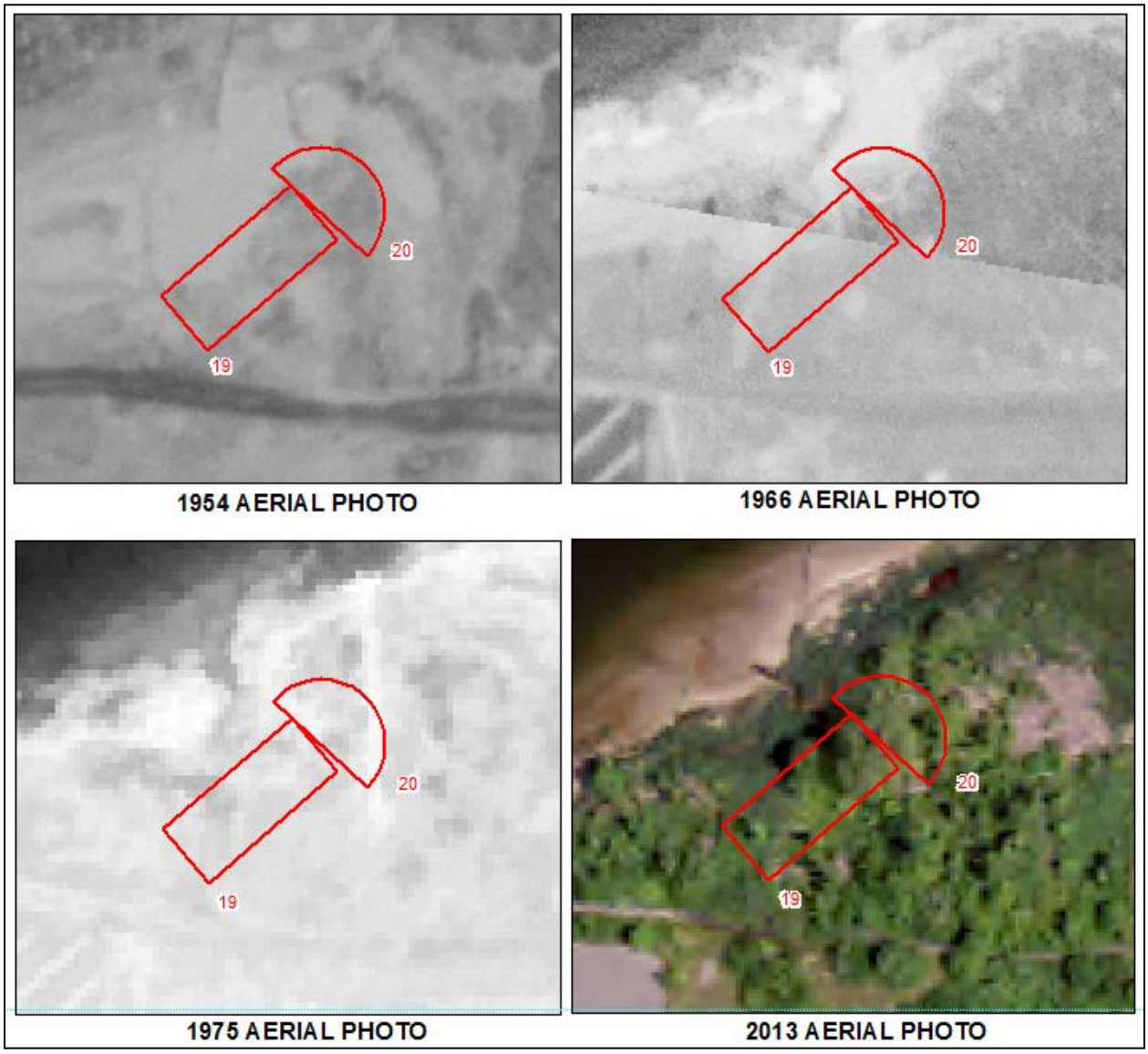


Figure 47 – Features of Interest Locations

The previously referenced 1945 map shows that there was a Pistol Range (**19**) constructed. Feature (**20**) above is depicted as it appears on the 1945 map and is most likely the location of the backstop or berm. However it is not shown on the available imagery from 1954, 1966, and 1975. By 2013 the overall area is covered with thick vegetation.

4.4.2.6 Pistol and Skeet Ranges

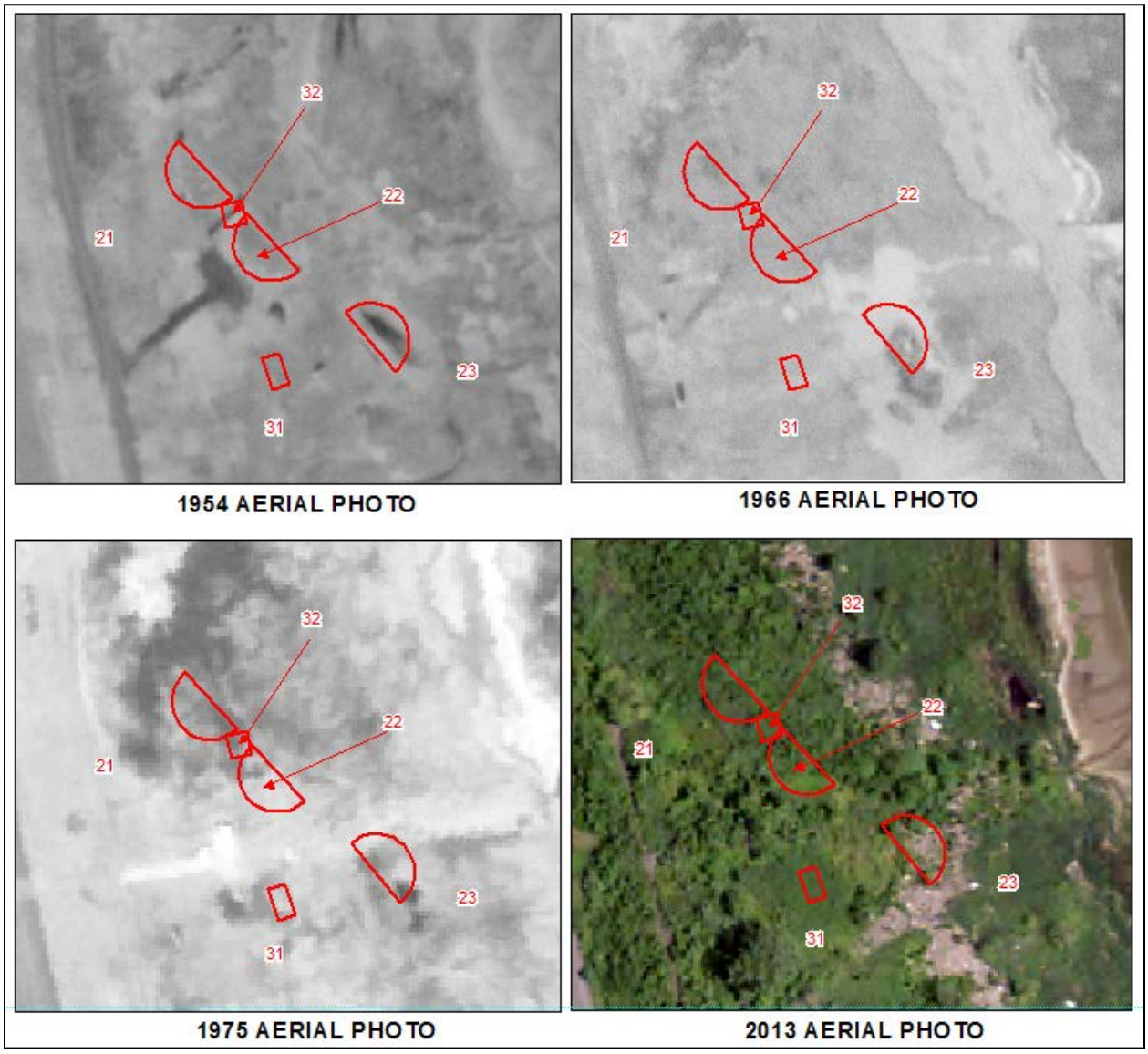


Figure 48 – Features of Interest Locations

Located along the northeastern portion of the property were three features labeled on the 1951 layout map as a "Proposed Pistol Range" and on the 1953 layout map as a "Skeet Range" (**21**, **22**, & **23**). It is unclear how the range complex was laid out in detail assigning areas to pistol vs. skeet shooting. The semicircles from the maps are much smaller than the approximately 30-acre semi-circle skeet range area. There were also two Ready Ammunition Storage Lockers in the vicinity (Building 168 (**31**) and Building 169 (**32**)). The 1954 imagery does show visible features, but by 1966 they appear to have been razed. The 1975 imagery does not show any change; however, the imagery is rather poor quality. By 2013 the areas had completely revegetated.

4.4.2.7 AAA Site and 90mm Gun Emplacements

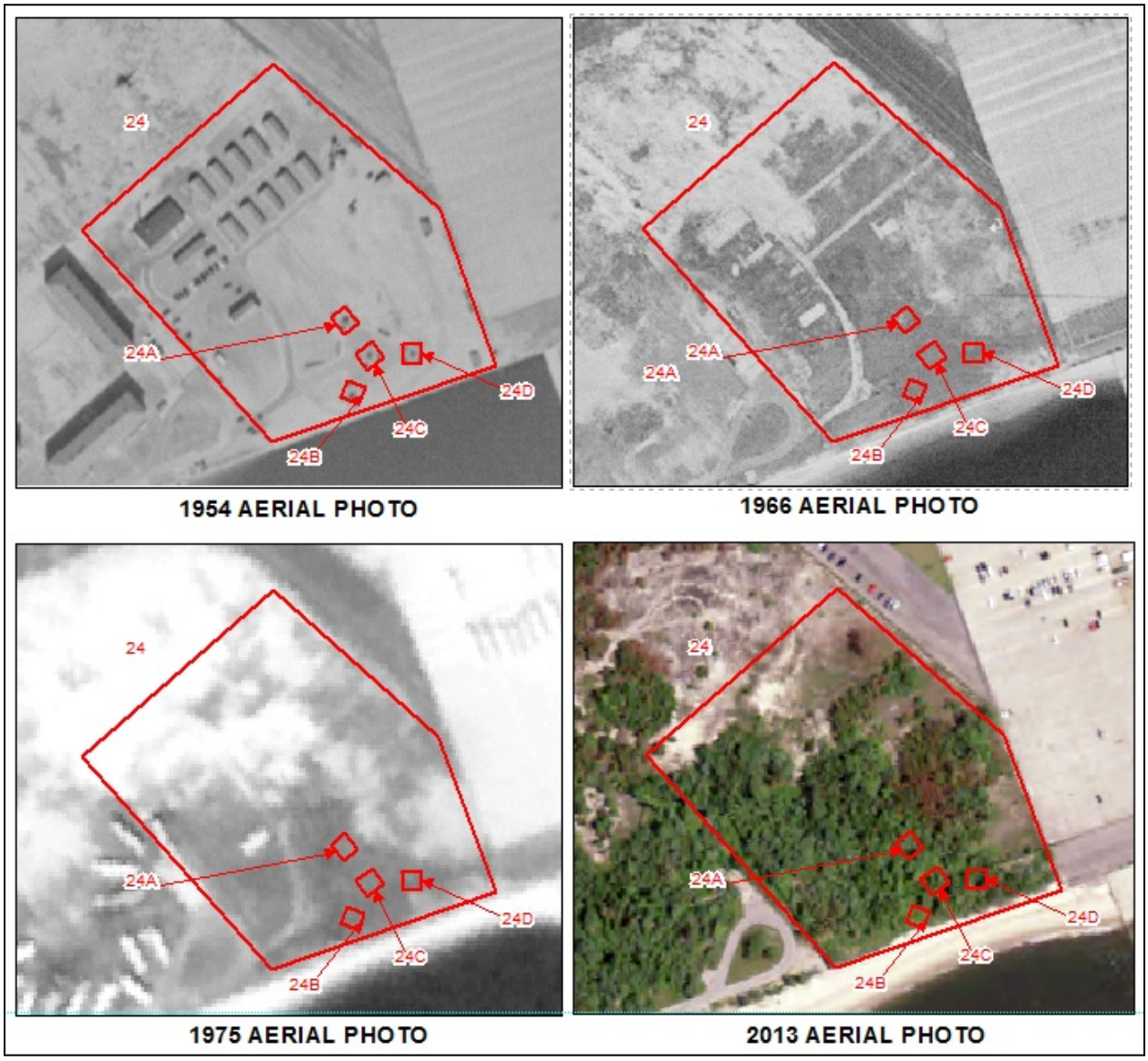


Figure 49 – Features of Interest Locations

The above four years of imagery show the area of the AAA Site **24** (Possible Gun Emplacements **24A, B, C & D**). The 1954 imagery shows the AAA site containing numerous buildings. Along the southern edge are four possible Gun Emplacements as indicated by the map dated 1953. By 1966 most of the buildings within the AAA site had been removed along with the Gun Emplacements. The 1975 imagery shows little change since 1966. By the year 2013, the area was mostly revegetated and no evidence of Gun Emplacements or buildings has been identified. This area is now on Marine Corps property and is therefore not eligible to be addressed under the FUDS program.

4.4.2.8 Indoor Rifle Range Building 72

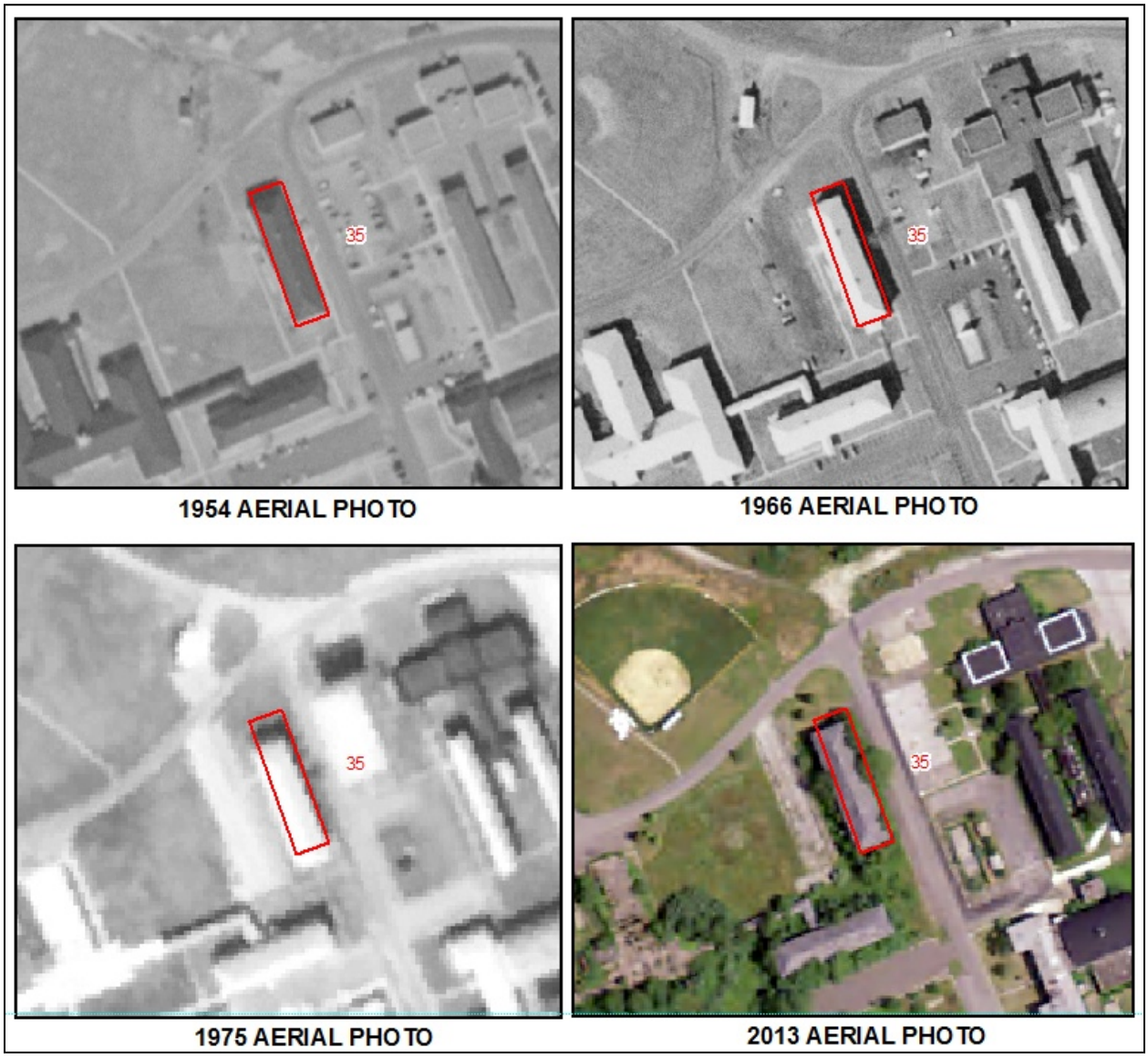


Figure 50 – Features of Interest Locations

The above four years of imagery show the area of the Indoor Rifle Range Building 72 (**35**) which remains present currently. The building measures approximately 215 feet by 55 feet.

5 EVALUATION OF MILITARY MUNITIONS PRESENCE

5.1 EVALUATION OF MEC PRESENCE

The investigation team uncovered evidence that the Navy both stored and utilized conventional ordnance at the FUDS. Military munitions used on Floyd Bennett Field centered on small arms training and included use of small arms ammunition on a gun test backstop, two pistol and skeet ranges, one trap range, and a least one confirmed off-site bombing area using practice bombs. In addition, there were at least five proposed or actually constructed indoor ranges. The installation also had magazines and ammunition lockers to store the associated munitions.

Analysis of the information gathered during this investigation identified a potential MMRP munitions-related AOI at the former Floyd Bennett Field. Potential munitions-related AOIs are those locations where there is a potential for UXO, DMM, or MC based on past use including several outdoor small arms ranges. Generally, indoor ranges and storage buildings are not regarded as munitions-related AOIs (see Section 5.4.3). Table 5.1 describes the former small arms ranges included in the munitions-related AOI identified from this investigation, which is depicted on Plate 7.

TABLE 5.1
Munitions-Related Areas of Interest[ii]

Potential AOI Ranges	Munitions Related Function	MEC Potential
1940s Gun Test Backstop (i.e. Firing-In-Butt or Stationary Aircraft Small Arms Range)	Firing small arms from aircraft mounted guns	**Not Suspected.** Only small arms used based on historical documents. No physical evidence remains. Area has been paved over.
1940s Small Arms Ranges (Pistol and Skeet Ranges)	Training with small arms ammunition.	**Not Suspected.** Only small arms used based on historical documents. The site visit did not locate any related debris or other evidence.
1950s Small Arms Ranges (Pistol and Skeet Ranges)	Training with small arms ammunition.	**Not Suspected.** Only small arms used based on historical documents. The site visit did not locate any related debris or other evidence.

[ii] The bombing areas and 90mm AAA locations associated with Floyd Bennett Field are not eligible for consideration under the Floyd Bennett Field FUDS property (see Sections 4.2.1.9 and 4.4.2.7).

Note that munitions-related AOIs are not the same as individual ranges; many of the range fans on this munitions-related AOI overlay one another forming a complex of ranges included in the potential single munitions-related AOI. The total acreage of the overlapping munitions-related AOI described above is 1,458 acres.

5.1.1 Munitions Technical Data

The investigation team compiled the following list of munitions potentially used at the former Floyd Bennett Field. While other munitions were stored at Floyd Bennett Field, only small arms are known or suspected to have been expended on the FUDS property.

This list is based on historical documentation retrieved during the research effort for this report, and was not confirmed by locating munitions debris during the 2014 property visit.

Technical data, including constituents, of the following military munitions potentially used or stored at the former Floyd Bennett Field are provided in Appendix F-Ordnance Technical Data Sheets**.**

Page No.	**Ordnance Technical Data Sheets**[iii]
Small Arms	
F-3	Small Arms

5.2 GENERAL EVALUATION OF CWM PRESENCE

5.2.1 Evaluation of CWM Presence

No CWM sites were identified, but Floyd Bennett Field had on hand items associated with chemical warfare training and decontamination. The investigation team uncovered evidence that the Navy stored and potentially utilized chemical warfare materials at the former Floyd Bennett Field for training. The documented CWM at Floyd Bennett Field consisted of one Chemical Agent Identification Sets (CAIS) Instructional Set "sniff set" (1943-1945). Other CAIS commonly used for training was the Detonation Set, M1, although no available documents confirmed their presence at Floyd Bennett Field.

The final disposition of the CAIS "sniff set" set remains unknown. Aerial photography analysis did not locate any distinct signs of on-site burial. Additionally, the property visit team did not uncover any evidence of CWM hazards. The possibility of subsurface on

[iii] Ordnance Technical Data Sheets are prepared by U.S. Army Corps of Engineers, St. Louis District, Environmental and Munitions Branch, Engineering Division.

site disposal at the former Floyd Bennett Field is conceivable; however, the investigation team found no information indicating this occurred.

5.2.2 CWM Technical Data

The U.S. military fielded CAIS containing toxic Chemical Warfare Agents (CWA) between 1928 and 1969. The CAIS first began with the sniff sets, followed by the detonation sets in the early 1930s and the toxic set in the early 1940s. The instructional CAIS, Instructional Gas Identification Set M1, or "sniff sets" consisted of bottles with very small amounts of CW agent, including mustard, chloropicrin and Lewisite. Troops used them for indoor instruction in identifying the smells associated with each type of agent prior to field exercises (see following figure).[194]

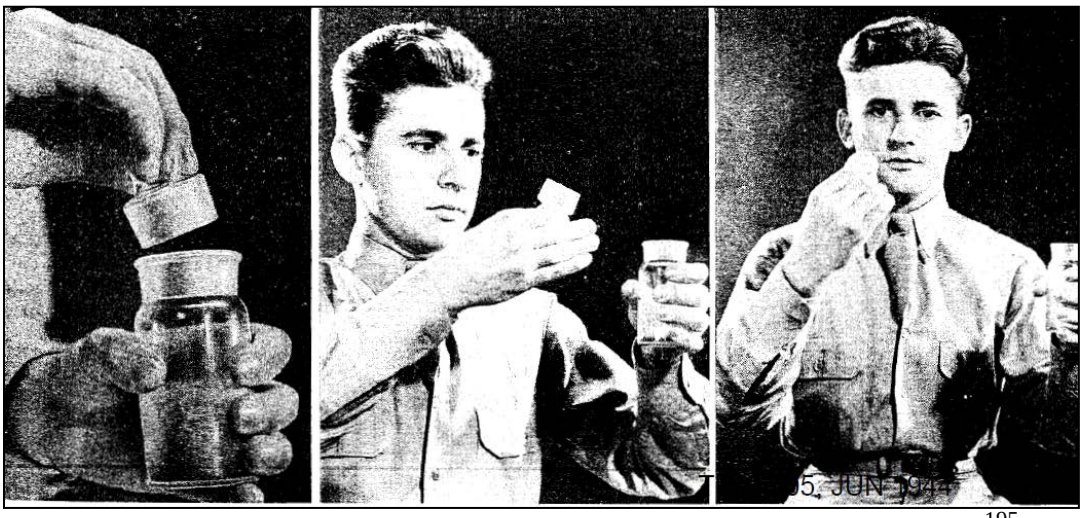


Figure 51 – "Procedure for using Sniff Set" or Instructional CAIS[195]

Physical and Chemical Characteristics Data Sheets

Chemical Warfare Material

F-17	War Gas Identification Set, Instructional, M 1, K951/K952
F-19	Gas Identification Set, Instructional, M1, (NAVY), K955
F-20	Chemical Warfare Agents Reference and Training Chart

There was no evidence to support the presence of CWM from V- and G- series nerve agent at the FUDS.

5.3 GENERAL EVALUATION OF MC PRESENCE

5.3.1 Conventional Munitions Constituents

The Ordnance Technical Data Sheets listed above in Sections 5.1.1 and included in Appendix F include information regarding the munitions constituents on the items identified at the former Floyd Bennett Field.

Furthermore, munitions may exist at the former Floyd Bennett Field that are no longer intact or did not completely function (e.g., low order detonation, ruptured dud round). This investigation did not attempt to determine all the potential breakdown or daughter products of the constituents identified that may currently exist on site.

Although clay pigeons used at targets on skeet ranges are not a direct constituent or breakdown product of small arms ammunition, they generally contain polycyclic aromatic hydrocarbons which are often addressed as MC on skeet ranges.

5.3.2 CWM Constituents

5.3.2.1 Chemical Warfare Agents

Inventory records indicate that the Navy at the former Floyd Bennett Field used CAIS in the form of instructional sniff sets. The Air Force at Floyd Bennett Field requested instructional sniff sets as well as an M-1 toxic gas set but receipt of the sets is not confirmed. The classroom setting for the use of the instructional CAIS "sniff sets" would limit a potential release to the environment of the constituents, although it might have occurred if disposed of onsite (e.g., buried). If the items were buried on site intact, there should not be a release to the environment unless subsequently broken. The same is true for the toxic CAIS, which were composed of various types of mustard (Sulfur Mustard (bis(2-chloroethyl)sulfide), H, HS, HD; Nitrogen Mustard (bis(2-chloroethyl)ethylamine), HN-1; Nitrogen Mustard (tris(2-chloroethyl)amine), HN-3).

According to the U.S. Department of Health and Human Services' Agency for Toxic Substances and Disease Registry toxicological profile, the natural degradation of sulfur mustard in soil is a result of chemical hydrolysis and biodegradation with the major product of chemical hydrolysis being thiodyglycol. *"During the dissolution process in water, the outer surface of a sulfur mustard droplet dissolves and is readily hydrolized to sulfonium ions and thiodiglycol. These compounds then react with the sulfur mustard to form 1,2-bis[(2-chloroethyl)thio]ethane and 1,2-dichloroethane or together to form stable sulfonium polymers."*[196]

5.3.2.2 Decontamination of Chemical Warfare Agents Operations

As discussed in section 4.2.1.10, Floyd Bennett Field had at least one CAIS sniff set as well as CW decontamination chemicals.

Although decontamination agents are not a direct constituent or breakdown product of the chemical agents in CAIS, decontamination exercises released decontamination agents directly to the environment where toxic CAIS were used. This is not directly an MEC concern but rather a potential HTRW issue.

Standard War Department guidance of the period states: *"Generally speaking, decontamination may be regarded as complete only when –*

> *a. Suitable decontaminating agents or materials have been thoroughly applied and allowed to remain in contact for a sufficient length of time.*
> *b. Chemical detector kits indicate an absence of vesicant agent."*[197]

The confirmed types of decontamination agents used or stored at the former Floyd Bennett Field include chloride of lime, RH-195, and tetrachlorethane. Based on related technical manuals and specifications of the period, the following information is summarized:[198]

> Calcium Hypochlorite (Bleaching Powder) – Also known as, chlorinated lime, calcium bleach, and **chloride of lime**; this decontaminating agent was used to chemically destroy or neutralize Chemical Agents H, L, ED, HN-1, HN-2, and HN-3. It was shipped and stored in metal containers, the most common size being 100-pound. Bleaching powder, with at least 35% available chlorine, was standardized in 1933 and renamed Bleaching Material Grade B. It served as the primary decontaminate for mustard in the 1920s-1930s and its use continued in the early 1940s due to its relatively low cost, despite its corrosiveness to equipment. Typically added to water as a slurry (only slightly soluble in water), and it was used to decontaminate terrain. It was also paired with Carbon Tetrachloride as a solvent. The Army classified it as obsolete in 1956.
>
> Decontaminating Agent, Non-Corrosive (DANC) – DANC was shipped in a two-part container. The upper compartment contained a powder (**RH-195**, 1,3 dichloro-5,5-dimethylhydantoin or M4 Decontaminating Agent) and the lower compartment contained 3 or 4 1/3 gallons acetylene tetrachloride (**tetrachloroethane**). The two parts were mixed in a 1:16 ratio (6.25% solution of RH-195) for use as a decontaminating agent. This decontaminating agent was effective against known vesicants.

5.4 PROPERTY-SPECIFIC LOCATIONS

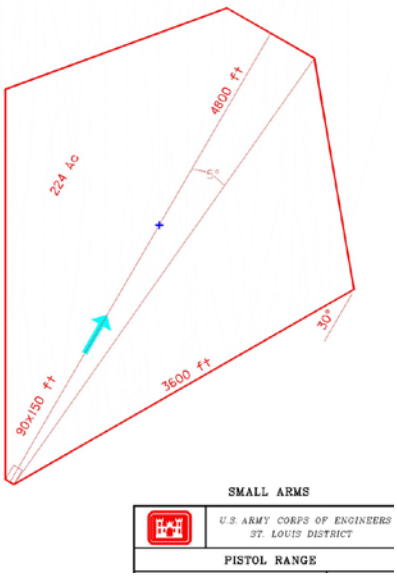
5.4.1 Range Layout Criteria

The investigation team identified a number of historic ranges at the former Floyd Bennett Field (see Plates 3, 4, 5, and 6). The information recovered for this investigation typically did not indicate the extent of the range fan or safety buffer area; therefore, munitions-related AOI boundaries have to be developed based on reference guidance and historical manuals. These manuals represent the general layout, which includes the safety buffer area of a range. The actual layout of the range may differ from these manuals due to terrain, installation boundaries, adjacent ranges, etc.; therefore, these standard range layouts are modified when additional information (e.g., number of firing positions, actual topography, etc.) is known. However, if no additional information is known, the standard layouts represented in these historical manuals are used. Munitions-related AOI boundaries delineated based on range safety fans represent the theoretical upper limit of the extent of the munitions area from that activity. The following subparagraphs described the methodology used to develop the range fans identified with the former Floyd Bennett Field.

Small Arms

- **Small Bore or Pistol**
- **Skeet & Trap**
- **Firing-In-Butt**

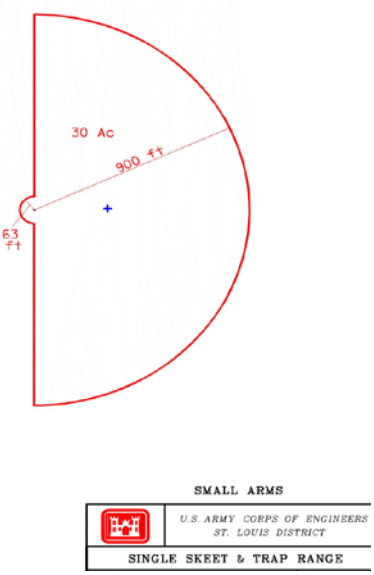
5.4.1.1 Small Bore or Pistol



The range fan layout for small bore, 1000-inch ranges are very similar to a pistol range varying in width and firing distance. A typical Pistol Range might accommodate 25 firing positions, and be approximately 30 yards wide by 50 yards deep. A pistol range is comprised of a salvage wall (earthen berm), the targets, the firing line(s), safety fan, and an area behind the firing lines, which typically included the ready line, ammunition issue point, and administrative area. The salvage wall (earthen berm) would have been constructed along the backside of the range approximately 5' to the rear of the target line. In situations where bluffs or steep hills were present, a salvage wall may not have been required. A five-foot opening typically separated each target. Firing lines would have been positioned at 5, 10, 15, and 25 yards in front of the targets. A 5° angle of fire extended from each end of the firing line down range a distance of 1,600 yards; and an additional 25° safety fan, which originated from the same points as the angle of fire, extended down range a distance of 1,200 yards.[199]

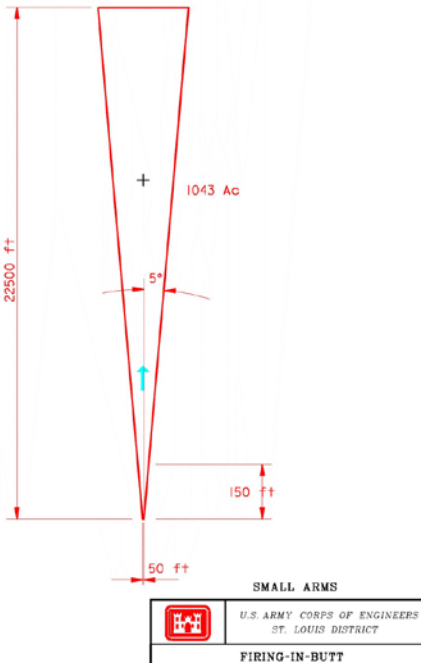
5.4.1.2 Skeet & Trap

Typically, skeet ranges should be located in open country. A range facility may consist of one or several shooting fields, which are normally positioned side by side. A shooting field is laid out in a semi-circle with a 63-foot radius. Many ranges utilized concrete walkways. The safety fan consists of a semi-circle with a 900-foot radius that utilizes the same apex as the shooting field. Trap houses may have been constructed of wood, concrete, or brick.[200]



5.4.1.3 Firing-In-Butt

Firing-in-butts were common to airfields. This range provided a designated area for crews to zero, service, and maintain aircraft weapon systems (fixed guns). Typical construction consisted of a hardstand for aircraft positioning. An earthen berm would have been necessary and constructed to the front of the aircraft. The distance from the hardstand is unknown, and may differ at various airfields. Based on experience (archive searches, site inspections, etc.), 150 feet is an accurate estimate. The safety zone for this range was derived using 5° angles that extended downrange a distance of 7,600 yards (consistent with .50 caliber ammunition). There is a possibility that when the berm was constructed, personnel considered it to be satisfactory in limiting the downrange distance for fixed guns; therefore, firing-in-butts may be found in areas not favorable for a general range safety fan.[201]



5.4.2 Munitions-Related AOI

5.4.2.1 Small Arms Ranges

Small Arms Ranges at the former Floyd Bennett Field included a gun test backstop (firing-in-butt or stationary aircraft small arms range) used in the 1940s, a pistol and

skeet range complex used in the 1940s, and a pistol and skeet range complex used in the 1950s (see following figure and Plate 7). There is significant overlap between all of the former ranges.

The gun test backstop appeared on base maps from 1943 to 1947 and was used for testing .30 and .50 caliber aircraft mounted guns. Its location is currently paved over.

The Navy proposed rifle and pistol ranges in 1941 but the first ranges shown on base maps are pistol and skeet ranges in 1945. The ranges remain on base maps through 1951.

By 1953 the Navy had constructed a new pistol and skeet range complex to replace the ranges used in the 1940s, which were shut down due to a runway extension. The ranges were used until at least the late 1950s.

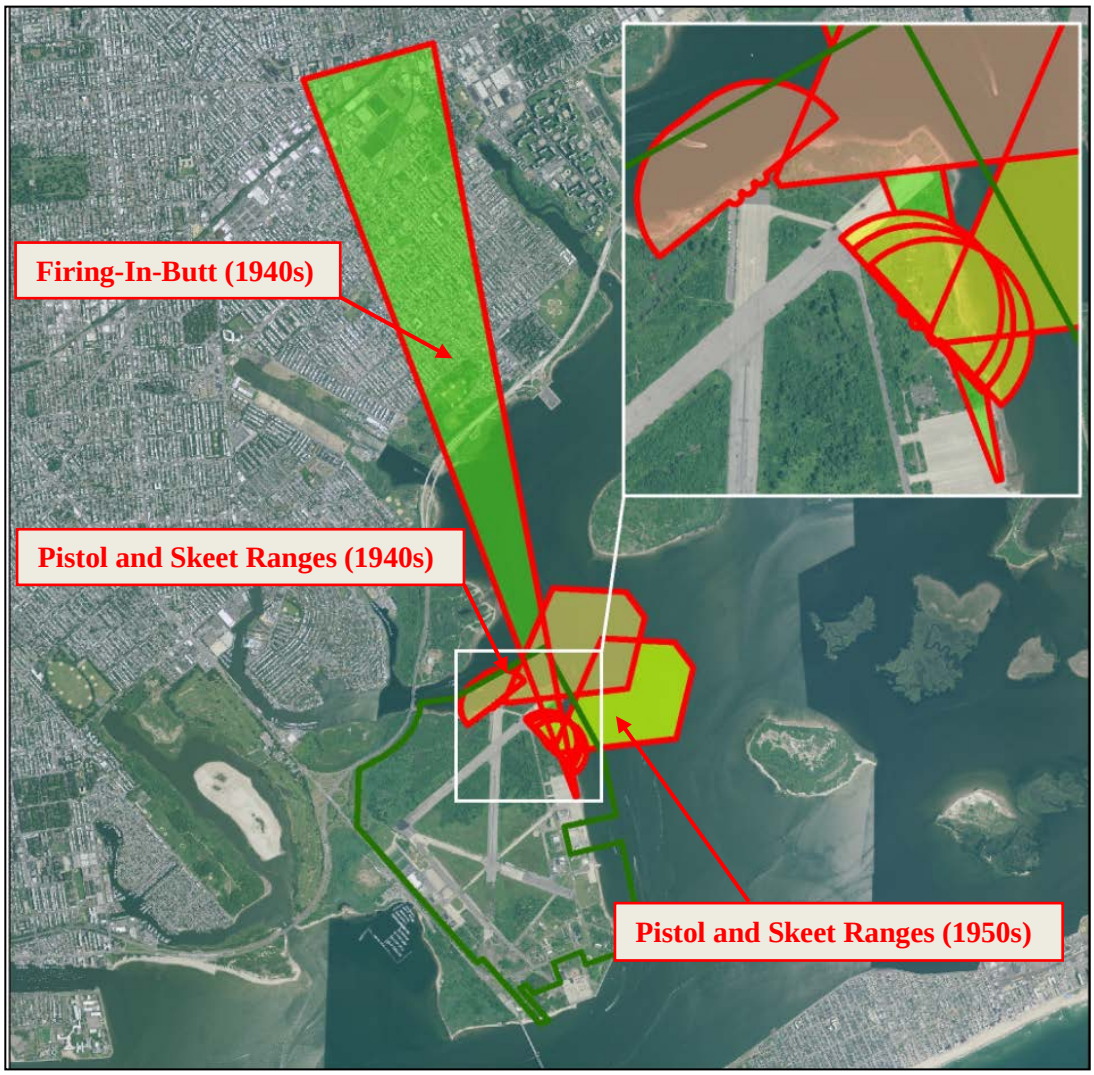


Figure 52 – Munitions-Related AOI

5.4.3 Other Munitions-Related Sites

Analysis of the information gathered during this investigation identifies the following former munition-related areas or facilities at the former Floyd Bennett Field that were not ranges and are not thought to have potential MEC / CWM hazards. No FUDS eligible projects are suspected to be associated with these areas.

TABLE 5.4.3
Other Munitions-Related Sites

Indoor Ranges and Storage Areas	Munitions/CWM Related Functions	Munitions/CWM Potential
Indoor Rifle Range	Small arms training	**Documented Past Use,** but only small arms used based on historical documents. No physical evidence.
Indoor Pistol Range	Small arms training	**Documented Past Use,** but only small arms used based on historical documents. No physical evidence.
NRAB Magazines	Munitions storage	**Documented Past Use,** but no physical evidence; the magazines are not evident on aerial imagery.
WWII Era Magazine Complex	Munitions Storage	**Documented Past Use,** but no physical evidence; the inspection did not locate any related debris or other evidence.
Ready Ammunition Storage and Lockers	Munitions Storage	**Documented Past Use,** but no physical evidence; the inspection did not locate any related debris or other evidence and the buildings have been demolished.

6 EVALUATION OF HTRW PRESENCE

The scope of this APA is focused on military munitions at the former Floyd Bennett Field; therefore, the evaluation of HTRW is not included in this report.

7 EVALUATION OF CON/HTRW AND BD/DR PRESENCE

The scope of this APA is focused on military munitions at the former Floyd Bennett Field; therefore, the evaluation of CON/HTRW and BD/DR is not included in this report.

8 PATHWAY AND ENVIRONMENTAL HAZARD ASSESSMENT

8.1 GROUNDWATER PATHWAY

8.1.1 Hydrogeologic Setting

The regional geology and soils are discussed in Sections 3.4.3 and Section 3.4.4 of this report, respectively. The former Floyd Bennett Field lies within the Atlantic Coastal Plain geologic province. Floyd Bennett Field is directly underlain by Pleistocene dredged fill and miscellaneous dredged fill/urban rubble to a depth of approximately 20 feet. Below the dredged material are natural deposits consisting of organic silt or marsh layers formed in tidal marshes. Below the organic layer are two units of Pleistene glacial outwash deposits composed of porous and highly permeable sand and gravel.[202]

The groundwater at the former Floyd Bennett Field consists of glacial hydrologic units and coastal plain units. The upper glacial aquifer is composed of Pleistocene deposits, followed by the Jameco aquifer. The upper glacial aquifer is separated from the deeper aquifers by a layer of the Gardiners Clay unit, which restricts vertical flow between them. The coastal plain units, situated below the glacial hydrologic units, are divided into the Magothy aquifer and the Lloyd aquifer, separated by the Raritan clay confining unit, which restricts vertical flow between upper aquifers and the Lloyd aquifer. Crystalline bedrock underlies the Lloyd aquifer.[203]

Groundwater depth at Floyd Bennett Field is generally two to 20 feet below ground surface (bgs) and is perched above saline water. Groundwater flow is expected to be toward Jamaica Bay, but localized groundwater flow is tidally influenced close to the shoreline. The majority of the water that enters the groundwater system remains in the upper glacial aquifer and moves laterally to discharge to the surrounding saltwater bodies.[204]

The former Floyd Bennett Field has been the focus of HTRW and CON/HTRW investigations. As such, numerous groundwater monitoring wells have been installed on the FUDS property; however, these wells are not utilized for drinking water.[205]

The U.S. EPA Safe Drinking Water Information System (SWDIS) and the U.S. Geological Survey (USGS), National Water Information System (NWIS) indicates no drinking water wells on or within 4 miles of Floyd Bennett Field. According to the SWDIS, all of Kings County is served by the New York City System water supply which obtains water from surface reservoirs over 40 miles north of Floyd Bennett Field.[206]

8.1.2 Groundwater Receptors

Groundwater beneath the former Floyd Bennett Field is precluded as a potable water source. As discussed above, there are no apparent groundwater drinking wells within 4 miles of the property; therefore, there are no primary or secondary target populations.

8.1.3 Groundwater Conclusions

The MC resulting from the deterioration of the small arms and skeet associated with the ranges at the former Floyd Bennett Field could potentially result in contamination given the relatively shallow depth to the aquifer at the FUDS. However, there are no primary or secondary target populations associated with the groundwater at the former Floyd Bennett Field.

8.2 SURFACE WATER PATHWAY

8.2.1 Hydrologic Setting

The regional surface water is discussed in Section 3.4.5 of this PA. The FUDS is surrounded on three sides by water (Jamaica Bay, Rockaway Inlet, Dead Horse Bay and Mill Basin Inlet) which eventually drains into the Atlantic Ocean.[207] The most prominent surface water feature at the former Floyd Bennett Field is Jamaica Bay, located at the site's southern and eastern boundaries. There are no streams or other bodies of water on-site. Approximately half of the annual precipitation infiltrates to the water table and recharges the groundwater system, while the other half is either lost to evaporation or direct runoff to Jamaica Bay.[208]

FEMA flood hazard maps indicate that the majority of the property located above the 500-year floodplain region (Zone X); only shoreline portions of the property are within the 100-year floodplain (Zone AE) (see Figure 5). [209]

8.2.2 Surface Water Receptors

This assessment did not identify any surface drinking water intakes within 15 miles down gradient of the former Floyd Bennett Field. The vast majority of the area population receives drinking water from surface water sources upgradient of the property and is connected to the municipal water supply system.

The property drainage empties into Jamaica Bay, which is used for recreational fishing and boating. Commonly caught fish include striped bass, bluefish, snapper blues, winter flounder, fluke, weakfish, porgy, blackfish, and black sea bass.[210] Since there is not a suspected release to surface water, these are considered a secondary target.

The U.S. Fish and Wildlife Wetland Inventory maps detail the wetlands located within the FUDS boundary and along the surface water migration path from this property. Since there is not a suspected release to surface drinking water, these wetlands are considered a secondary target. [211]

Figure 53 *– U.S. Fish and Wildlife Wetland Inventory Map* [212]

8.2.3 Surface Water Conclusions

The investigation team did not see clear indications, such as stressed vegetation or discolored water, indicating a release of MC to area surface water; however, given the close proximity of Jamaica Bay to the former ranges at the FUDS, it is possible that MC (small arms bullets) were released to surface water when munitions functioned there while it was in operation during the 1940s and 1950s. It is unclear if MC continues to be released to surface water in detectable quantities from soil in range areas on the FUDS.

8.3 SOIL EXPOSURE AND AIR PATHWAYS

8.3.1 Physical Conditions

The current land use and ownership is discussed in Section 3.3.2 of this report. The public has unrestricted access to the former Floyd Bennett Field as it makes up a portion of the Gateway National Recreation Area. Use restrictions are limited to NPS rules and

regulations. Immediately following disposal of the property by the military, the land became national park lands, but small portions have been redeveloped for a mixture of uses including commercial areas, community gardens, and a helicopter launch area. Portions of the property remain undeveloped.

The topography of the former Floyd Bennett Field can generally be described as flat. Soil at the former Floyd Bennett Field is primarily composed of dredge material from the Jamaica Bay channel and from the construction of a shipping harbor in 1928, with additional miscellaneous fill/urban rubble. Dredge material filled in the 1930s consisted of medium to fine quartz sand with some mica and traces of silt, as wells as small amounts of coal, oyster shells, and metal. Miscellaneous fill/urban rubble consisted of course to fine sand and gravel, crushed brick and cinders, broken glass, shells, and rubble. The fill material is largely loose and unconsolidated. The primary vegetation type can generally be described as barren or low grass but perimeter areas have dense vegetation with some trees. [213]

This investigation identified past munitions activities and facilities based on textual documents, historical maps, and aerial photography (see Section 4.2); however, the APA property visit did not visually identify any munitions debris or fragments of clay pigeons from skeet shooting on the FUDS (see Appendix L). The historical identified, confirmed past use for small arms and skeet shooting indicates the release of MC and the potential for latent MC contamination on the FUDS.

8.3.2 Soil and Air Receptors

The former Floyd Benefit Field is predominantly utilized for recreational purposes including camping, fishing, hiking, biking, baseball/softball, and model airplane flying. Additionally NPS employees and contractors perform work on the FUDS.[214]

The population on the FUDS out to a 4-mile radius was not calculated for this APA but current aerial imagery shows that a 4-mile radius from the FUDS property extends well into the densely populated portion of Brooklyn, NY. The 2013 population of Kings County was 2,592,149 (see Section 3.3.4).

Potential Terrestrial Sensitive Environments consisting of the habitats of Federal and State listed rare, threatened or endangered animal and plant species (see Section 3.4.7) may be present in the vicinity of the former Floyd Bennett Field; however, this assessment did not positively establish these habitats to be present on site. In addition, as discussed above in surface water pathway, there are wetlands located within four miles of the property.

8.3.3 Soil Exposure and Air Pathway Conclusions

Research uncovered historical records and confirmed with aerial imagery associating munitions activities with Floyd Bennett Field while it was in operation in the 1940s and 1950s. However, the property visit team was unable to visually identify any visual evidence of munitions debris or fragments of clay pigeons from skeet shooting within the FUDS boundary (see Appendix L).

Direct contact of MC remaining in surface soil by persons working or conducting recreational activities on site is possible. Any potential exposure is lessened by the presence of dense vegetation in some areas and development of the property with construction, roads, pavement, and landscaping in other areas. However, the property is accessible to the public, and the suspected contamination is in close proximity to recreational areas.

9 SUMMARY AND CONCLUSIONS

9.1 AREAS THAT MAY WARRANT NO FURTHER ACTION BY DOD

The APA investigation identified potential projects for the former Floyd Bennett Field related to former small arms ranges as discussed in Section 9.2 below. Although the military stored explosive munitions on the FUDS, there is no evidence that they were used on the property. Therefore, no action is recommended with regard to military munitions for the remaining portions of the FUDS property not included in the munitions related AOI described below.

9.2 POTENTIAL HAZARDS THAT MAY WARRANT FUDS PROJECTS

As noted in Section 2.1 of this APA, prior to this assessment, the New York District of the U.S. Army Corps of Engineers prepared an INPR in 1991 for the former Floyd Bennett Field (C02NY0020) in support of the DERP for FUDS. One CON/HTRW project (see Section 2.1.4) and one HTRW project (see Section 2.1.5) were identified for the C02NY0020 property as a result of the previous FUDS investigations. This APA investigation has also identified locations of munitions related use by the DoD on the former Floyd Bennett Field FUDS property (see Section 4.2.1).

9.2.1 MMRP

Based on the findings of this assessment, there is no identified MEC potential on the FUDS property. Although the Navy stored numerous munitions at Floyd Bennett Field, only small arms ammunition is known or suspected to have been used at the FUDS property and only small arms ammunition presents any potential FUDS eligible munitions-related AOI.

The investigation team identified one potential MMRP munitions-related AOI consisting of several overlapping small arms ranges at the former Floyd Bennett Field. Confirmed small arms ranges at the former Floyd Bennett Field include pistol ranges, skeet ranges, and a firing-in-butt (stationary aircraft small arms range). Table 5.1 describes the munitions-related AOI identified from this assessment, which is depicted on Plate 7. The potential exists for residual MC and clay pigeon debris to remain at the locations of skeet ranges within the AOI. However, much of the acreage within the range boundaries is developed or covered with dense vegetation and potential hazards from MC exposure are unclear.

Furthermore, the investigation team uncovered evidence that the Navy utilized chemical warfare materials at the former Floyd Bennett Field for training (see Section 4.2.1.10). The CWM consisted of CAIS Instructional Sets. However, locations of training and specific CWM related facilities at Floyd Bennett Field are undetermined. The final

disposition of the CAIS sets remains unknown. The investigation team found no information indicating that any sub-surface on-site disposal occurred on the FUDS property. Additionally, the property visit team did not uncover any evidence of CWM hazards. Therefore, no identifiable remediation project exists at the former Floyd Bennett Field concerning CWM.

9.2.2 PRP/MMRP Considerations

This assessment did not identify any previous or subsequent use of the property relating to munitions or explosives; therefore, there are no Potential Responsible Party (PRP) considerations regarding MMRP at the former Floyd Bennett Field.

APPENDIX A

REFERENCE SOURCES AND RECORDS REVIEWED

APPENDIX A

A REFERENCE SOURCES AND RECORDS REVIEWED

The research team searched at the following locations for records relating to munitions, and chemical warfare activities at the former Floyd Bennett Field. At these repositories, the research team used finding aids and records managers to assist in locating documents relevant to the research topic. The investigation team also accumulated complementary documents reviewed on the former Floyd Bennett Field, but not specifically used. These complementary documents are stored with the original APA back-up documents. Appendix B contains the References of all in text endnote citations. All back-up references gathered for this investigation whether directly cited in this report or not have been digitized and are available with the digital files. Appendix J-Interviews lists additional repositories and/or personnel contacted which reported no pertinent information. The following subparagraphs described the research team's efforts at the noted archival repositories:

A.1 TEXTUAL AND CARTOGRAPHIC REPOSITORIES

The following repositories were consulted primarily for textual and cartographic information regarding the former Floyd Bennett Field.

A.1.1 Air Force Historical Research Agency

600 Chennault Circle
Maxwell AFB AL 36112-6424
334-953-5834, Front desk
Tammy Horton
334-953-2960
Archie Difante
334-953-2447
FAX: 334-953-4434
http://www.au.af.mil/au/afhra/

The research team used the online research search engine to identify potentially relevant materials to review on Floyd Bennett Field. Generally speaking the results included airplane accident reports and two listings for a First Air Force Reserve Unit and a Troop Carrier Wing stationed there. Due to the limited amount of information, the repository was not visited.

A.1.2 Critical Past LLC
12100 Sunrise Valley Drive
Box E-230-16
Reston, Virginia 20191
800-249-4430/ 302-724-4153
http://www.criticalpast.com/

The research team used the online research search engine to identify potentially relevant films and photo images that this company has gathered royalty-free from various sources including the National Archives. This repository has several films on Floyd Bennett Field but none show training ranges. The material was reviewed but not acquired for this investigation.

A.1.3 Defense Technical Information Center (DTIC)
8725 John J. Kingsman Road Ste. 0944
Ft. Belvoir, VA 22060-6218
1-800-CAL-DTIC (1-800-225-3842)
Mary Jones, Research
703-767-9603
Registration Office
703-767-8673
http://www.dtic.mil/dtic/

The Defense Technical Information Center (DTIC) is the largest central resource for DoD and government-funded scientific, technical, engineering, and business related information. It is a DoD Field Activity within the Under Secretary of Defense for Acquisition, Technology and Logistics, reporting to the Director, Defense Research & Engineering. DTIC provides ready access to relevant information formerly contained in their various Technical Information Centers or libraries located throughout the DoD (e.g. scanned PDFs of reports). DTIC's origins date back to WWII and a shared Air Corps and Navy document center (i.e. library) to collect process and distribute scientific and technical reports. DTIC sponsors a number of additional Information Analysis Centers (IACs) including the Chemical, Biological, Radiological, Nuclear Information Analysis Center (formerly CBIAC). A DTIC information query accesses not only the information catalogue / database within the DTIC holdings but also within the IACs as well, allowing a search for a report in multiple different repositories. The unclassified material is available on-line, though much of the material has distribution restrictions limiting it within DoD. Classified documents are available as well but are distributed in hard copy form.

The research team conducted an on line search of the database and downloaded pertinent documents.

A.1.4 Environmental Data Resources, Inc.

6 Armstrong Rd, 4th Floor
Shelton, CT 06484
800-352-0050
http://www.edrnet.com/

Due to munitions-only scope, the research team did not utilize EDR's environmental and historical land use records database for this APA.

A.1.5 Library of Congress (LOC)

101 Independence Ave, SE
Washington, DC 20540
http://www.loc.gov/
http://www.loc.gov/pictures/collection/hh/

The Historic American Buildings Survey/Historic American Engineering Record/Historic American Landscapes Survey (HABS/HAER/HALS) collection at the LOC includes numerous documents, drawings, large-format photographs, and written histories for more than 38,600 historic structures and sites. The NPS HABS, HAER and HALS programs is on-going and new documentation is added continually and online digitization is occurring in phases. The research team queried the HABS/HAER/HALS collection of the LOC and located no pertinent material related to the site.

A.1.6 National Archives I at Washington, DC

8th and Pennsylvania
Washington, DC 20408-0001
Jill Abraham
202-501-5671
http://www.archives.gov/dc-metro/washington/index.html

The research team reviewed the following items based on analysis of the available Findings Aids:

Record Group 38 (Records of the Office of the Chief of Naval Operations)

Entry 275 Security Classified General Records Relating to the Development of Shore Stations, 1920-1942
Box 13

Record Group 71 (Records of the Bureau of Yards and Docks)

Entry 19 General Correspondence, 1925-1942
Boxes 1030, 1055-1058, 1159, 2045-2049, 2051-2055

Entry 20 Confidential Central Correspondence History Cards, 1918-1941
Boxes 9, 10, 17

Entry 20 Confidential Correspondence, 1918-1941
Boxes 43, 55

Record Group 72 (Records of the Bureau of Aeronautics)

Entry 62A General Correspondence, 1925-1942
Boxes 3610, 3624, 3629, 3850-3853, 3890-3899, 3925

Record Group 127 (Records of the U.S. Marine Corps)

Entry 18A General Correspondence, 1913-1932; 1933-1938
Box 48

Record Group 153 (Records of the Judge Advocate General)

Entry 56A JAG Reservation File
Box 286

A.1.7 National Archives at College Park (NARA-CP), Textual Records

8601 Adelphi Road
College Park, MD 20740-6001
301-837-6800
http://www.archives.gov/dc-metro/college-park/index.html

For each of the Record Groups (RG) of potential interest at this repository, the research team reviewed the Master Location Register (MLR) and Finding Aids available in the public research rooms to help locate potential Entries / Series / Accessions of records of relevance and if possible refined to specific boxes. The team also consulted with staff archivists and the NARA Online Public Access (http://www.archives.gov/research/search/) search engine (formerly the Archival Research Catalog or ARC) for additional suggested material. The following is a detailed list records researched at this repository.

Record Group 19 (Records of the Bureau of Ships)

Entry 1266J General Correspondence Filed Under Filing Classifications N1 to OV, 1940-1945
Boxes 1-5, 63, 94, 95, 481-493

Entry 1270 General Correspondence, 1943
Boxes 31, 34, 47, 48, 165, 169

Entry 1271 General Correspondence, 1944
Boxes 77, 81, 102, 259

Record Group 38 (Records of the Chief of Naval Operations)

Entry 2 Chief of Naval Operations General Correspondence, July 1942-June 1943
Boxes 38, 39, 48, 49, 133, 134, 143, 144

Entry 2 Chief of Naval Operations General Correspondence, July 1943-June 1944
Boxes 140, 153, 154, 257, 259, 284, 285

Entry 2 Chief of Naval Operations General Correspondence, July 1944-June 1945
Boxes 560, 561, 706, 728

Entry 2 Chief of Naval Operations General Correspondence, July 1945-June 1946
Boxes 1015, 1141, 1143, 1159

Record Group 51 (Records of the Office of Management and Budget)

Entry 149B Inspection Reports, 1940-1945
Box 255

Record Group 71 (Records of the Bureau of Yards and Docks)

Entry 1001 Naval Property Case Files, 1941-1958
Boxes 823-836

Entry 1012 Miscellaneous Records From Mr. Dudley Head of Real Estate Section, 1945
Box 3

Record Group 72 (Records of the Bureau of Aeronautics)

Entry 62B General Correspondence, 1943-1945
Boxes 2812, 2833, 2845, 2936, 2991, 3062, 3072, 3282, 3300, 3354, 3401, 3402, 3461

Entry 62B General Correspondence, 1946
Boxes 390, 391, 397, 406, 407, 424, 436, 438, 458, 460, 483, 497, 506

Entry 62B General Correspondence, 1947
Boxes 409, 424

Entry 67 Confidential Correspondence, 1922-1944

Boxes 1082, 1099, 1108, 1123, 1127, 1171, 1201

Entry 67A Confidential General Correspondence, 1945
Box 288

Entry 195 Division Histories, 1941-1947
Boxes 7-10, 16, 17, 22

Entry 1001A Unclassified General Correspondence, 1948-1949
Box 438

Entry 1001B Unclassified General Correspondence, 1950
Box 224

Entry 1001C Unclassified General Correspondence, 1951
Box 196

Entry 1001E Unclassified General Correspondence, 1953
Box 273

Entry 1001F Unclassified General Correspondence, 1954
Box 207

Entry 1001G Unclassified General Correspondence, 1955
Boxes 220, 221

Entry 1001H Unclassified General Correspondence, 1956
Box 208

Entry 1001I Unclassified General Correspondence, 1957
Boxes 212, 213

Entry 1001J Unclassified General Correspondence, 1958
Box 165

Entry 1001K Unclassified General Correspondence, 1959
Box 153

Entry 1004B Secret General Correspondence, 1949
Boxes 24-26

Record Group 74 (Records of the Bureau of Ordnance)

Entry 25I Confidential Correspondence, 1942

Boxes 202, 203, 209

Entry 25J Restricted Correspondence, 1942
Boxes 435, 441, 454

Entry 25 O Restricted Correspondence, 1943
Box 474

Entry 25U Confidential Correspondence, 1944
Box 503

Entry 25V Restricted Correspondence, 1944
Box 911

Entry 1001 Correspondence, 1907-1949
Boxes 60, 61, 98

Entry 1002A Office of Construction and Procurement Subject Files, 1945
Boxes 445-447, 1211, 1280

Entry 1002B Office of Construction and Procurement Subject Files, 1946
Boxes 239, 240, 241, 258, 284, 285

Entry 1002C Office of Construction and Procurement, 1947
Boxes 193, 206

Entry 1003A Office of Administration General Subject Files, 1942
Box 4

Entry 1003A Office of Administration General Subject Files, 1943
Box 7

Entry 1003A General Correspondence Unclassified/Confidential, 1948-1949
Boxes 160, 574, 585

Entry 1003C General Correspondence, Unclassified and Confidential, 1948-1959
Boxes 992, 1001, 1502, 1512, 2077

Entry 1004 General Correspondence, Unclassified and Confidential, 1948-1959 (1953 Unclassified)
Boxes 92, 93

Entry 1005 Entry 1004 General Correspondence, Unclassified and Confidential, 1948-1959 (1953 Confidential)

Boxes 24, 25

Entry 1006 General Correspondence, Unclassified and Confidential, 1948-1959 (1954 Unclassified)
Boxes 91, 92

Record Group 77 (Records of the Office of the Chief of Engineers)

Entry 551 Administrative Services Realty Historical Files, 1952-1954
Boxes 9-12

Record Group 80 (Records of the Department of the Navy 1804-1944)

Entry 16 SEC/NAV General Correspondence (formerly Security Classified), 1940-1947
Boxes 1330, 1331

Record Group 121 (Records of the Public Buildings Service)

Entry 5 Real Property Surveys Division, FY 197-FY 1975
Box 12

Entry 80A Title Papers, 1838-1959
Box 1372

Record Group 127 (Records of the U.S. Marine Corps)

Entry 18B Office of the Commandant General Correspondence, 1939-June 1950
Boxes 210, 228, 232, 1091, 1092

Record Group 143 (Records of the Bureau of Supplies and Accounts)

Entry 78 History of the Bureau of Supplies and Account, 1897-1961
Boxes 5, 62

Record Group 338 (Records of U.S. Army Operational, Tactical, and Support Organizations (World War II and Thereafter))

Entry 37042 Unit Histories, 1940-1967
Box 1229

Record Group 342 (Records of the U.S. Air Force Commands, Organizations and Activities)

Entry 2 Continental U.S. Numbered Air Forces, 1940-1965

Boxes 1, 15, 4, 67, 91, 100

Record Group 429 (Records of Organizations in the Executive Office of the President [EOP])

Entry 12 Central Real Property Surveys
Boxes 30, 31

Entry 17 Records Relating to Property and Installation Surveys, 1978-1984
Box 37

A.1.8 National Archives, Cartographic and Architectural Branch
8601 Adelphi Road
College Park, MD 20740
301-837-3200

The research team reviewed the Military, Forts, Posts and Installations Finding Aid notebooks in the cartographic research room and located the following items:

Record Group 23 (Records of the U.S. Coast and Geodetic Survey); filed under Record Group 370 (Records of the National Oceanic and Atmospheric Administration

Entry Sectional Aeronautical Charts - New York
Folder 1935-1951

Record Group 71 (Records of the Bureau of Yards and Docks)

Entry Series I Bureau of Yards and Docks Microfilm
Reels 61, 62

Entry Series II Index Cards
Box41

Entry Series II Bureau of Yards and Docks Microfilm
Reels 305, 329, 330

Entry Bureau of Yards and Docks Flat Map Files (Paper Copies)
Folder 303-3-21 to 303-30-Unnumbered (Floyd Bennett)
Folder 303-31-31 to 303-45-217 (Floyd Bennett)

Record Group 80 (General Records of the Department of the Navy)

Entry 80-AERIALFILM Aerial Photography of the Bureau of Aeronautics, 1942-1958

Folder Brooklyn Marine Corps

A.1.9 National Archives at College Park, Still Pictures Branch
8601 Adelphi Road
College Park, MD 20740
Reference Desk
301-837-0561

Record Group 71 (Record of the Bureau of Yards and Docks)

Entry 71-CB Photographs of Construction Progress and Completion at Naval Shore Installations, 1940-1943
Boxes 16, 85

Entry 71-CP Photographs of Construction and Aerial Views of Naval Public Works Facilities and Utilities, 1941-1953
Box 71-CP-09
Box 71-CP-51
Box 71-CP-74
Box 71-CP-81

Record Group 80 (General Records of the Department of the Navy)

Entry 80-CF Decimal Classified Photographic File, 1916-1945
Boxes 81, 86, 87

A.1.10 National Archives at College Park - Motion Picture, Sound and Video Reference
8601 Adelphi Road
College Park, MD 20740
301-837-0526
http://www.archives.gov/dc-metro/college-park/visit-motion-picture-room.html

The research team queried the NARA Online Public Access (http://www.archives.gov/research/search/) search engine for suggested materials but found nothing relevant.

A.1.11 National Personnel Records Center Military Personnel Records (NPRC, MPR)

Appraisal and Disposition Section
1 Archives Drive
St. Louis, MO 63138
314-801-0800
Wilson Sullivan, Archivist, Military Operations Branch
314-801-9174
http://www.archives.gov/st-louis/index.html

The primary mission of the NPRC, MPR is to store the Official Military Personnel Files from all service branches for veterans for NARA; however, the NPRC, MPR retains a significant amount of Army and Air Force records accessioned after World War II that is slowing being processed for retention elsewhere in the NARA system, primarily at the College Park facility. The material was assigned to basic records groups based on whether it came from the Army or the Air Force:

Record Group 338 (Records of U. S. Army Commands, 1942-)
Record Group 342 (Records of the U.S. Air Force Commands, Organizations and Activities)

The research team reviewed the available finding aids for this material and the "01" Accession Series descriptions to identify boxes of potentially relevant information on the property and did not identify any pertinent records relating to the subject property.

A.1.12 National Archives at Philadelphia

14700 Townsend Road
Philadelphia, PA 19154-1096
215-606-0012

For each of the RGs of potential interest at this repository, the research team reviewed the Finding Aids available in the public research rooms to help locate potential Entries / Series / Accessions of records of relevance and if possible refined to specific boxes. The team also consulted with staff archivists and the NARA Archival Research Catalog (http://www.archives.gov/research/arc/index.html) for additional suggested material. The NARA facility in Philadelphia currently houses records for the NARA New York.

Record Group 26 (Records of the U.S. Coast Guard)

Entry Third Coast Guard District, Plans of Lighthouses, Life Saving Stations, and Other Facilities
1 Map Folder (28 maps)

Record Group 181 (Records of Naval Districts and Shore Establishments)

Entry Third Naval District Headquarters New York, NY Commandant's Office General Correspondence, 1926-1938
Boxes 31, 181, 182, 184, 187, 188

Entry Headquarters Third Naval District New York, NY Commandant's Files, 1939-1942
Boxes 26, 107, 184-187, 201-206

Entry New York Navy Yard Commandant's Office General Correspondence, 1941-1942
Boxes 185, 186

Entry 322 New York Navy Yard, Commandant's Office General Correspondence, 1938-1940
Box 114

Entry Third Naval District, Commandant's Office Administrative Files, 1941-1945
Box 78

Entry District Civil Engineers Office, General Correspondence
Box 141176

A.1.13 Naval Historical Center, Naval Aviation History Branch
Building 200
Washington Navy Yard
Washington, D.C. 20374-5060
Dale "Joe" Gordon", Lead Reference Archivist
Dale.gordon@navy.mil
202-433-9675

The research team reviewed histories for Floyd Bennett Field.

Entry Shore Commands Pre-1998
Box 198 (NAS NY)

Entry Aviation Commands, 1941-1952
Box 248 BAR NY 1928-1946 through NAS NY 1942-1952

Box 248A "Skyscrapers" 1943-1944 Vol I

Entry Aviation Commands, 1941-1955
Box 249 New York-NTS 16 Mar 1942-31 Dec 1944

A.1.14 Naval History and Heritage Command
805 Kidder Breese Street, SE
Building 108
Washington Navy Yard
Washington, D.C. 20374-5060
Lisa Crunk, photo archivist
Lisa.crunk@navy.mil
202-433-7879

The research team visited the photo archive and reviewed photos on Floyd Bennett Field.

L39 Box 14 (files 1-6) New York

A.1.15 U.S. Navy Seabee Museum
Naval History Heritage Command
1001 Addor Street
Port Hueneme, CA 93043
Gina Nichols
805-982-6497
Gina.nichols@navy.mil
Mailing address:
Naval Base Ventura County
Building 100
Port Hueneme, CA 93043
www.usnavyseabeemuseum.com

The research team identified the following available records. Due to the limited amount of records and the costs associated with traveling to this repository, the records were not reviewed.

Record Group 5 Geographic File Collection, 1800-2010

Series II U.S. Geographical Collection
New York-Brooklyn, real estate
NAS New York

Record Group 10 Audio/Visual Collection Sub-Record Group: New York Geographical Photographs, 1941-1959
Box 3
Box 13 (aerials)
Box 15

3rd Naval District Map Books

A.1.16 U.S. Army Chemical Materials Agency
AMSCM-SSP
5183 Blackhawk Road
APG-EA, MD 21010-5424
1-800-488-0648, Public Affairs
Rusty Fendick, NSCMP PM
410-436-8094
http://www.cma.army.mil/home.aspx

The U.S. Army Chemical Materials Agency's Non-Stockpile Chemical Materiel Project (NSCMP) provides centralized management and direction to the U.S. Department of Defense for the disposal of non-stockpile chemical warfare materiel. In 1993 the NSCMP developed a Survey and Analysis Report to identify location, types and quantities of non-stockpile chemical material. That report was updated in 1996 and released publicly and the Floyd Bennett Field property was not included among the listed properties.

A.1.17 National Park Service
U.S. Department of the Interior
Gateway National Recreation Area, Division of Resources Management
Cultural Resources Management
210 New York Avenue
Staten Island, NY 10305
Felice S. Ciccione, Chief Curator
Felice_ciccione@nps.gov
718-654-4537

The research team visited the National Park Service curator for the Gateway National Recreation Area which contains information on several NPS properties around New York and New Jersey. The team copied a newspaper article referring to an indoor pistol range and photos of Navy personnel firing at a pistol range. The research team asked the curator if she had heard of any ordnance being found at Floyd Bennett Field in the past. She thought grenades had been found at the field but could not give a location or timeframe.

A.1.18 U.S. Marine Corps Reserve Center
6th Communication Battalion
1 Aviation Road
Brooklyn, NY 11234
SGT Gateman
718-252-3100, Ext 237

The research team visited the U.S. Marine Corps Reserve Center. The team discussed the mission and determined Feature 24 or the Anti Aircraft Artillery (AAA) positions located

on the southeastern portion of the former Floyd Bennett Field area now currently located on Marine Corps property. The Marine Corps has future plans for construction in this area and are currently initiating an environmental impact statement. The Marine Corps has no firing ranges at the former Floyd Bennett Field and were unaware there once were AAA positions located on their footprint. The research team reviewed maps from the facilities section.

A.1.19 U.S. Army Corps of Engineers, New York District
CENAN-PP-E
Jacob K. Javits Federal Building
26 Federal Plaza; Room 1811
New York, NY 10278-0098
Sandra L. Piettro, FUDS Project Manager
917-790-8487

The research team began their research of this property by consulting the property back-up files for this investigation completed by and on behalf of the Corps of Engineers Geographic District, the New York District. The majority of these documents have been digitized and uploaded to the Corps wide FUDS Records Management Database (FRMD) and applicable documents to this investigation were downloaded from FRMD. This included the INPR/FDE files and other pertinent project files

A.1.20 U.S. Army Research, Development and Engineering Command (RDECOM) Historical Office
Bldg. E-5027, Blackhawk Road
Aberdeen Proving Ground Edgewood Area, MD 21010-5423
Jeffery Smart, Command Historian
410-436-4430
Kathy Ciolfi
410-436-8459

The research team consulted the SBCCOM History Office Finding Aid - Areas Used by the Chemical Warfare Service during the 1900s for the subject sites and looked up the noted references within the SBCCOM collection. They also reviewed the state and WWII drawers in the file cabinets for related material. No copies of pertinent information were gathered.

A.1.21 Washington National Records Center
4205 Suitland Road
Suitland, MD 20746-8001
Mike Wasche
301-778-1513
http://www.archives.gov/dc-metro/suitland/

The research team did not identify any pertinent records relating to the subject property that would be located at this repository.

A.2 AERIAL PHOTOGRAPHY REPOSITORIES

The following repositories were consulted for aerial imagery of the property. Note historical imagery that exceeded 1:40,000 scale was not considered for acquisition. The light gray shading indicates historical imagery that is planned for purchase.

A.2.1 National Aerial Resources (NAR)

6 Highland Avenue
Alban, NY 12205
800-827-2994
http://www.aerialsearch.net/

NAR maintains a fairly complete, comprehensive and up-to-date listing of aerial photography available from numerous sources both public and private. The research team did not perform a search of imagery for Floyd Bennett Field at this repository.

A.2.2 National Archives at College Park, Cartographic & Architectural Branch

8601 Adelphi Road
College Park, MD 20740
301-713-7040

The research team consulted the aerial photo coverage overlays in Record Group 373 (Records of the U.S. Defense Intelligence Agency) for imagery at a scale of 1:40,000 or better covering the area. The contractor pulled the index sheet but did not identify pertinent photos.

The research team also consulted *Aerial Photographs in the National Archives-Special List 25*, dated 1990, for available imagery from:

Record Group 57 (Records of the U.S. Geological Survey)
Record Group 95 (Records of the U.S. Forest Service)
Record Group 114 (Records of the Soil Conservation Service)
Record Group 145 (Records of the Agriculture Stabilization and Conservation Service)

The team did not locate pertinent imagery from these record groups.

A.2.3 U.S. Geological Survey - EROS Data Center
47914 252nd Street
Sioux Falls, South Dakota 57198
800-252-4547 ext. 2074
http://edcwww.cr.usgs.gov/

CEMVS-EC-S tasked a contractor to perform an initial search of available imagery for Floyd Bennett Field, Kings County, NY. The contractor identified the following imagery that covers the property.

Aerial Photo Mosaics

Acquisition Date	Scale	Entity ID	Image Type	Project	Frame Nbr	# Frames

Note: No data was found in this record group

Aerial Photography Single Frame

Acquisition Date	Scale	Entity ID	Image Type	Project	Roll Nbr	Frame Nbr	# Frames
1/4/1954	1:20,000	AR1VBV00006XXXX	BW	VBV00	6	129 thru 131	3
2/18/1954	1:20,000	AR1VBV00010XXXX	BW	VBV00	10	26 thru 28 68 thru 71	8
2/22/1966	1:24000	AR1VBIO0003XXXX	BW	VBIO0	3	2 thru 5 41 thru 43 90 thru 93	11
12/3/1966	1:12000	AR1VBPR0001XXXX	BW	VBPR0	1	12 thru 14 27 thru 31 39 & 40 49 thru 51	13
4/10/1975	18000	AR630600220XXXX	BW	30600	4	20 thru 23 110 thru 112 182 thru 184	10
4/10/1975	18000	AR630600220XXXX	BW	30600	21	18 thru 21 103 thru 106	8
4/13/1975	19000	AR630600430XXXX	BW	30600	22	18 thru 21 103 thru 106	8
4/13/1975	19000	AR630600410XXXX	CLR	30600	41	18 thru 21 105 thru 109	9
4/13/1975	19000	AR630600430XXXX	BW	30600	43	18 thru 21 105 thru 109	9
4/11/2002	15000	ARUNYC00002XXXX	CLR	NYC00	2	7 thru 10 97 thru 101	9
12/17/2002	8000	ARLGATE0001XXXX	IR	GATE0	1	7800 thru 7802 7809 thru 7816 7825 thru 7832 7842 thru 7846	24

Note: *Last 4 digits of the Entity ID are the frame number (replace XXXX with frame number – include leading zeros).*

DOQ

Acquisition Date	Resolution (meters)	Entity ID	Map Name	Quadrant	Band Type	Remarks

4/4/1994	1	DI00000000846387	CONEY ISLAND	NE	RGB	
4/8/1994	1	DI00000000846392	FAR ROCKAWAY	NW	RGB	

High Resolution Orthophotography

Beginning Date	Ending Date	Resolution (meters)	Dataset Name	# Tiles	Remarks
4/15/2004	5/7/2004	2ft	200403_new_york_city_ny_2ft_sp_clr	7	
1/1/2006	3/1/2006	0.5	200601_ae_queens_county_ny_0x5000_utm_clr	4	
3/1/2006	3/1/2006	0.5	200603_new_york_city_ny_0x5000m_utm_clr	3	
4/1/2006	4/1/2006	2ft	200604_new_york_city_ny_2ft_sp_clr	7	
4/1/2008	4/1/2008	2ft	200804_long_island_ny_2ft_sp_cnir	7	
3/30/2012	6/20/2012	2ft	201203_long_island_ny_2ft_sp_cnir	7	

NAPP

Acquisition Date	Entity ID	Project	Roll Nbr	Frame Nbr	Film Type	Project Number	# Frames
4/8/1994	NP0NAPP008003XXX	NAPP	8003	70 thru 72	CIR	9441	3
4/8/1994	NP0NAPP008001XXX	NAPP	8001	65 thru 71	CIR	9441	7

Note: *Last 3 digits of the Entity ID are the frame number (replace XXX with frame number – include leading zeros).*

NHAP

Acquisition Date	Scale	Entity ID	Project	Roll Nbr	Frame Nbr	Film Type	# Frames
3/26/1984	1:58,000	NC1NHAP830179XXX	NHAP83	179	63 thru 66	CIR	4
3/16/1985	1:58,000	NC1NHAP830225XXX	NHAP83	225	64 thru 67	CIR	4

Note: *Last 3 digits of the Entity ID are the frame number (replace XXX with frame number – include leading zeros).*

A.2.4 U.S. Department of Agriculture – Farm Service Agency
Aerial Photography Field Office
2222 West 2300 South
Salt Lake City, UT 84119-2020
801-975-3653
http://www.fsa.usda.gov

CEMVS-EC-S tasked a contractor to perform an initial search of available imagery for Floyd Bennett Field, Kings County, NY. The contractor identified the following imagery that covers the property.

YEAR	RES/SCL	PROG	%COV *	BND/FLM	FMT	QTY *	REMARKS
1984	60000	NHAP1	100	CIRP			
1994	40000	NAPP2	100	CIRP			
1994	1	NDOP	100	CIR	MR	1	CCM
2006	1	NAIP06	100	NC	MR	1	CCM .196GB
2006	1	NAIP06		NC	GT	16	QQ 2.178GB
2006	40000	NAIP06		CP			
2008	1	NAIP08	100	NC	MR	1	CCM .018GB
2008	1	NAIP08		NC	GT	2	QQ .273GB
2008	40000	NAIP08		CP			

2009	1	NAIP09	100	NC	MR	1	CCM .096GB
2009	1	NAIP09		NC	GT	12	QQ 1.634GB
2011	1	NAIP11	100	NC	MR	1	CCM .096GB
2011	1	NAIP11		M4B	GT	12	QQ 2.185GB

* %COV and QTY represents amounts for entire county and not necessarily the site

APPENDIX B

REFERENCES AND REFERENCE MATERIAL

B REFERENCES AND REFERENCE MATERIAL

The reference numbers below refer to the endnote citations in the main text of the document. The citations refer to file names of digital scans of the source material backup documents. On the digital version of this report, the references are scanned images of the source material, typically saved as Adobe PDF files for textual material or as a TIF or JPG file for map or photo references. The file name or the last page of the PDF file indicates the location where the source material was located. The listing and scope of repositories searched for the gathered documents are listed in Appendix A - Reference Sources and Records Reviewed. The following list of endnote references only represents the items directly cited in preparation of this report, and do not illustrate all the documents reviewed or copied for the reference material.

[1] 2004-05-10 *ER 200-3-1, Environmental Quality - FUDS Program Policy*
1991-09 *Guidance for Performing Preliminary Assessments Under CERCLA*

[2] 1984-05-23 Site Visit for Scope of Work for Building Dem at 3 Sites C02NY002001_01.13_0500_p.pdf

[3] 1986-09-30 Site Survey Report C02NY002001_01.08_0001_a.pdf

[4] 1991-06-07 Forwarding INPR recommending remediation C02NY002001_01.08_0003_a.pdf
1992-04-02 Change to Project and Property Numbers C02NY002001_01.01_0008_p.pdf
1992-06-22 Assignment of New Site Numbers C02NY002001_01.01_0009_p.pdf

[5] 1991-06-07 Forwarding INPR recommending remediation C02NY002001_01.08_0003_a.pdf

[6] 1991-10-01 Authorization of RD and RA for CONHTRW C02NY002001_01.08_0006_a.pdf

[7] 1997-03-17 Closure Report for Floyd Bennett Field C02NY002001_02.13_0001_a.pdf

[8] 2011-12-30 Removal of Underground Fuel Oil Piping and AST Pads C02NY002001_02.22_0500_p.pdf

[9] 2000-01-31 Approval for HTRW project C02NY002001_01.08_0012_a.pdf
1999-10-07 Amended Site Survey Summary Sheet C02NY002001_01.08_0015_a.pdf

[10] 2010-01-19 Site Survey Report C02NY002002_03.13_0500_p.pdf

[11] 2011-07-20 Final Rev Interim Data Summary Report of Field Investigations AOC 1 C02NY002002_03.02_0500_p.pdf

[12] 2014-06-26 FBF USACE-NAN Trip Report.pdf

[13] 2005-06 Modified Phase IA Cultural Resources Inventory C02NY002002_01.06_0502_a.pdf

[14] 2007-11 Environmental Condition of Property Report C02NY002002_01.06_0501_a.pdf

[15] 2010-08-25 Final WP for Underground Jet Fuel Piping C02NY002001_02.04_0501_p.pdf

[16] 2009 FBF NPS Cultural Landscape Report.pdf

[17] http://boulter.com/gps/

[18] 1931-06-23 Permit for occupancy of hangar.pdf
1932-05-17 City of New York Department of Docks.pdf
1933-06-20 City of NY grants perm to US Navy to occupy hangar at MunAirport.pdf
1935-11-13 City of New York Department of Docks.pdf
1940-06-20 Leases with Commissioners of Docks.pdf
1940-06-12 Acquisition of 16.4 Acres Seaplane Base.pdf
1941-12-20 Acquisition of Land.pdf

[19] 1941-12-20 Acquisition of Land.pdf

[20] 1991-06-07 Forwarding INPR recommending remediation C02NY002001_01.08_0003_a.pdf

[21] 1942-06-30 US NAS NY Showing Conditions on NARACP_RG71_E Flat Map Files.JPG

[22] 1940-06-30 Floyd Bennett Field Showing Conditions on NARACP_RG71_E Flat Map Files.JPG

[23] 1971-02-01 Command History 1 Jan 1970 to 1 Feb 1971.pdf
[24] 1977-03-15 Former NAS Brooklyn New York.pdf
1975-04-16 Sec of Defense to GSA.pdf
1991-06-07 Forwarding INPR recommending remediation C02NY002001_01.08_0003_a.pdf

1987-10-20 Structures Key Map C02NY002001_01.04_0002_p.pdf
2004-05-10 *ER 200-3-1, Environmental Quality - FUDS Program Policy*

[25] 1987-10-20 Structures Key Map C02NY002001_01.04_0002_p.pdf

[26] 1987-10-20 Structures Key Map C02NY002001_01.04_0002_p.pdf
1977-03-15 Former NAS Brooklyn New York.pdf

[27] 1987-10-20 Structures Key Map C02NY002001_01.04_0002_p.pdf
1977-03-15 Former NAS Brooklyn New York.pdf
2012-05 NPS National Gateway Recreation Area.pdf

[28] 2015-09-23 Floyd Bennett Park NPS Pamphlet.pdf
[29] 2012-05 NPS National Gateway Recreation Area.pdf

[30] For County, City and state data use:
U.S. Census Bureau; http://quickfacts.census.gov/qfd/index.html

[31] National Oceanic and Atmospheric Administration (NOAA) National Climatic Data Center; NOWData - NOAA Online Weather Data
http://www.sercc.com/nowdata; LaGuardia Airport, NY, 2000-2015

[32] National Oceanic and Atmospheric Administration (NOAA) National Climatic Data Center; NOWData - NOAA Online Weather Data
http://www.sercc.com/nowdata

[33] 2007-11 Environmental Condition of Property Report
C02NY002002_01.06_0501_a.pdf

[34] 2007-11 Environmental Condition of Property Report
C02NY002002_01.06_0501_a.pdf

[35] 1979 USGS Quad Coney Island NY and NJ.tif

[36] 2007-09-05 FEMA Flood Insurance Rate Map 3604970359F.pdf
FEMA Flood Map,

[37] 2007-11 Environmental Condition of Property Report
C02NY002002_01.06_0501_a.pdf

[38] 2007-11 Environmental Condition of Property Report
C02NY002002_01.06_0501_a.pdf

[39] 2007-11 Environmental Condition of Property Report
C02NY002002_01.06_0501_a.pdf

[40] 2007-11 Environmental Condition of Property Report
C02NY002002_01.06_0501_a.pdf

[41] 2007-11 Environmental Condition of Property Report
C02NY002002_01.06_0501_a.pdf

[42] 2007-11 Environmental Condition of Property Report
C02NY002002_01.06_0501_a.pdf

[43] U.S. Fish & Wildlife Service, Environmental Conservation Online
http://ecos.fws.gov/tess_public/

[44] National Register of Historic Places, Focus Database
Website: http://nrhp.focus.nps.gov/natreghome.do?searchtype=natreghome
as accessed on 25 March 2015
National Parks Service, National Register of Historic Places Download Center
Website: http://nrhp.focus.nps.gov/natreg/docs/Download.html
2009 FBF NPS Cultural Landscape Report.pdf

[45] 1985 United States Navy and Marine Corps Bases, Domestic
[46] 1931-06-08 Weekly News Letter.pdf
[47] 1931-06-23 Availability of Facilities NRAB.pdf
[48] 1985 United States Navy and Marine Corps Base, Domestic, Paolo E. Coletta
[49] 1936-08-27 Aerial Floyd Bennett Field (detail) NARACP_RG80_E80-CF_Bx87.jpg
[50] 1931-07-30 Commanders Annual Report of Activities.pdf
[51] 1931-07-30 Commanders Annual Report of Activities.pdf
[52] 1935-07-12 Naval Air Establishment at Floyd Bennett Field.pdf
[53] 1935-12-09 Treasury Dept Communication.pdf
[54] 1936-04-10 Memo to Chief Legal Section Procurement Division.pdf
[55] 1937-03-13 CG Air Station Under Construction.pdf
[56] 1939-01 NRAB View South to North NARACP_RG80_E80-CF_Bx87.jpg
[57] 1931-06-23 Permit for occupancy of hangar.pdf
[58] 1941-04-21 Designation of NAS NY.pdf
[59] 1941-06-02 Commissioning Ceremonies.pdf
[60] 1941-06-02 NAS New York Regulations.pdf
[61] 1942-01-10 Expansion of NRAB.pdf
[62] 1941-09-27 Security NAS NY.pdf
1945 ca Historical Record of NAS 1928-1944
[63] 1941-12-26 Land Adjacent to Field SW (detail) NARACP_RG80_E80-CF_Bx87.pdf
[64] 1945 ca Historical Record of NAS 1928-1944.pdf

[65] 1942 ca Aerial (detail) NARACP_RG80_E80-CF_Bx87.jpg
1942 ca Aerial Floyd Bennett (detail) NARACP_RG80_E80-CF_Bx87.jpg
[66] 1946-03-29 Naval Aviation Personnel Accomplishments.pdf
[67] 1942-03-26 NRAB Abolished.pdf
[68] 1942-04-12 Aircraft Ferry Division and Aircraft Equip.pdf
[69] 1942-06-06 Use of Naval Air Station.pdf
1985 United States Navy and Marine Corps Bases, Domestic
[70] 1943-07-03 NAS NY NARACP_RG72_E62B 1943-1945_B3354_FN39NA68.pdf
[71] 1945 ca Historical Record of NAS 1928-1944.pdf
[72] 1985 United States Navy and Marine Corps Bases, Domestic
[73] 1944-06-04 Aerial View of NAS Naval Aviation History Br Navy Yard.pdf
[74] 1945-07-27 Combat Aircrew Training Discontinuance.pdf
[75] 1945-12-27 NAS Floyd Bennett Status of.pdf
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APPENDIX C

ABBREVIATIONS, ACRONYMS, AND BREVITY CODES

ABBREVIATIONS, ACRONYMS AND BREVITY CODES

The following list contains abbreviations, acronyms and brevity codes within this Abbreviated Preliminary Assessment, as well as typical others.

AA	Anti-Aircraft
AAA	Anti-Aircraft Artillery
ADU	Aircraft Delivery Unit
AED	Aircraft Equipment Division
AOI	Area of Interest
APA	Abbreviated Preliminary Assessment
APT	Armor Piercing-with Tracer
ASR	Archives Search Report
ASSHP	Abbreviated Site Safety and Health Plan
AST	Above-ground Storage Tank
BD/DR	Building Demolition/Debris Removal
bgs	below ground surface
CA	Chemical Agent
CAIS	Chemical Agent Identification Set
cal	Caliber
CEMVS-EC-E	Ordnance and Technical Services Branch of the U.S. Army Corps of Engineers, St. Louis District
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CON/HTRW	Containerized/Hazardous, Toxic, and Radioactive Waste
CW	Chemical Warfare
CWA	Chemical Warfare Agents
CWM	Chemical Warfare Materials
CWS*	Chemical Warfare Service
DANC	Decontaminating Agent, Non-Corrosive
DERP	Defense Environmental Restoration Program
DMM	Discarded Military Munitions
DoD	Department of Defense
DTIC	Defense Technical Information Center
EM-CX	Environmental & Munitions Center of Expertise
EOD	Explosive Ordnance Disposal
FDE	Findings and Determination of Eligibility
FRMD	FUDS Records Management Database
FUDS	Formerly Used Defense Sites
GIS	Geographic Information System
GP	General Purpose
GPS	Global Positioning System
HABS/HAER/	Historic American Buildings Survey/Historic American Engineering

HALS	Record/Historic American Landscapes Survey
HE	High Explosive
HTRW	Hazardous Toxic and Radioactive Waste
HTW	Hazardous and Toxic Waste
IAC	Information Analysis Center
LOC	Library of Congress
MATS	Military Air Transport Service
MC	Munitions Constituents
MD	Munitions Debris
MEC	Munitions and explosives of concern
MLR	Master Location Register
mm	Millimeter
MMRP	Military Munitions Response Program
MPR	Military Personnel Records
MRA	Munitions Response Area
MRAOI	Munitions related area of interest
MRS	Munitions Response Site
MRSPP	Munitions Response Site Prioritization Protocol
msl	mean sea level
NAAS*	Naval Auxiliary Air Station
NARA	National Archives and Records Administration
NAS*	Naval Air Station
NAS NY	U.S. Naval Air Station New York
NATS	Naval Air Transport Service
NCP	National Contingency Plan
n.d.	No Date
NDAI	No DoD Action Indicated
NOAA	National Oceanic and Atmospheric Administration
NPRC	National Personnel Records Center
NPS	National Park Service
NRAB	Naval Reserve Aviation Base
NRC	National Records Center
NSCMP	Non-Stockpile Chemical Materiel Project
PA	Preliminary Assessment
PM	Project Manager
POC	Point of Contact
POL	Petroleum, Oils and Lubricants
PRP	Potentially Responsible Party
RCWM	Recovered Chemical Warfare Material
RG	Record Group
SARA	Superfund Amendments and Reauthorization Act
TIF	Tagged Information File
TM	Technical Manual
TNT	Tri-Nitro-Toluene

TR	Training Regulations
USACE	U.S. Army Corps of Engineers
USAESCH	U.S. Army Engineering and Support Center, Huntsville
USFWS	U.S. Fish and Wildlife Service
UST	Underground Storage Tank
UXO	Unexploded Ordnance
WW II	World War II

* designates an historic acronym

APPENDIX D

GLOSSARY

GLOSSARY

The following list contains a glossary of selected terms associated with the FUDS program; however, inclusion of these terms does not indicate they are specifically applicable to this APA. Source references for the definitions are provided in the endnotes that follow.

Active Range[i]

A military range that is currently in service and is being regularly used for range activities

Anomaly Avoidance[ii]

Techniques employed on property known or suspected to contain UXO, other munitions that may have experienced abnormal environments (e.g., DMM), munitions constituents in high enough concentrations to pose an explosive hazard, or CA, regardless of configuration, to avoid contact with potential surface or subsurface explosive or CA hazards, to allow entry to the area for the performance of required operations.

Chain of Custody[iii]

The activities and procedures taken throughout the inspection, re-inspection and documentation process to maintain positive control of MPPEH to ensure the veracity of the process used to determine the status of material as to its explosive hazard. This includes all such activities from the time of collection through final disposition.

Chemical Agent (CA)[iv]

A chemical compound (to include experimental compounds) that, through its chemical properties produces lethal or other damaging effects on human beings, in intended for use in military operations to kill, seriously injure, or incapacitate a person through its physiological effects. Excluded are research, development, testing and evaluation (RDTE) solutions, riot control agents, chemical defoliants and herbicides, smoke and other obscuration materials; flame and incendiary materials; and industrial chemicals.

Chemical Agent (CA) Hazard[v]

A condition where danger exists because CA is present in a concentration high enough to present potential unacceptable effects (e.g., death, injury, damage) to people, operational capability, or the environment.

Chemical Agent Identification Sets (CAIS)[vi]

CAIS are military training aids containing small quantities of various chemical warfare agents and other chemicals.

Chemical Agent (CA) Safety[vii]

A condition where operational capability and readiness, people, property, and the environment are protected from the unacceptable effects or risks of a mishap involving chemical warfare material (CWM) and CA in other than munitions configurations.

Chemical Warfare Agents (CWA)

Are the V- and G-series nerve agents, H-series (i.e., "mustard" agents) and L-series (i.e., lewisite) blister agents, and certain industrial chemicals used by the military as weapons, including hydrogen cyanide (AC), cyanogens chloride (CK), or carbonyl dichloride (called phosgene or CGI00. CWA do not include riot control agents (e.g., w-chloroacetophenone (CN) and ochlorobenzylidenemalononitrile (CS) tear gas), chemical herbicides, smoke or incendiary compounds, and industrial chemicals that are not configured as a military munition.

Chemical Warfare Material (CWM)

Items generally configured as a munition containing a chemical compound that is intended to kill, seriously injure, or incapacitate a person through its physiological effects. CWM includes V- and G- series nerve agents or H-series (mustard) and L-series (lewisite) blister agents in other-than-munition configurations; and certain industrial chemicals (e.g., hydrogen cyanide (AC), cyanogen chloride (CK), or carbonyl dichloride (called phosgene or CG)) configured as a military munition. Due to their hazards, prevalence and military-unique application, chemical agent identifications sets (CAIS) are also considered CWM. CWM does not include: riot control devices; chemical defoliants and herbicides; industrial chemicals (e.g., AC, CK, or CG) not configured as a munition; smoke and other obscuration producing items; flame and incendiary producing items; or soil, water, debris or other media contaminated with low concentrations of chemical agents where no CA hazards exist.[viii]

Chemical Warfare Material (CWM) *is a general term that includes four subcategories of specific materials:*

- *CWM, explosively configured are all munitions that contain a CWA fill and any explosive component. Examples include M55 rockets with CWA, the M23 VX mine, and the M360 105-millimeter GB artillery cartridge.*
- *CWM, nonexplosively configured are all munitions that contain a CWA fill but that do not include any explosive components. Examples include any chemical munition that does not contain an explosive component and VX or mustard agent spray canisters.*
- *CWM, bulk container are all non-munitions-configured containers of CWA (e.g., a tone container).*
- *Chemical Agent Identification Sets (CAIS). All forms of CAIS are scored the same except for CAIS K941, toxic gas set M-1; and K942, toxic gas set M-2/E-11, which are scored higher due to the relatively large quantities of agent they contain.* [ix1]

Chemical Warfare Material (CWM) Response[x]

Munitions responses and other responses to address the chemical safety; explosives safety, when applicable; human health; or environmental risks presented by CA-filled munitions and CA in other than munitions configurations. (See munitions response.)

Closed Range[xi]

A military range that has been taken out of service as a range and that either has been put to new uses that are incompatible with range activities or is not considered by the military to be a potential range area. A closed range is still under the control of a DoD component.

Construction Support[xii]

Assistance provided by DoD EOD or UXO-qualified personnel and/or by personnel trained and qualified for operations involving CA, regardless of configuration, during intrusive construction activities on property known or suspected to contain UXO, other munitions that may have experienced abnormal environments (e.g., DMM), munitions constituents in high enough concentrations to pose an explosive hazard, or CA, regardless of configuration, to ensure the safety of personnel or resources from any potential explosive or CA hazards.

[1] On 23 April 2007, the Department of the Army changed the 5 September 1997 Interim Guidance for Biological Warfare Material (BWM) and Non-Stockpiled Chemical Warfare Material (CWM) Response Activities to state that CAIS that do not contain dilute amounts of nerve agent or neat Chemical Agent (i.e., CAIS K941 and K942) are no longer considered CWM.

Cultural Debris[xiii]

Debris found on operational ranges or munitions response sites, which may be removed to facilitate a range clearance or munitions response, that is not related to munitions or range operations. Such debris includes, but is not limited to: rebar, household items (refrigerators, washing machines, etc.), automobile parts and automobiles that were not associated with range targets, fence posts, and fence wire.

Defense Site[xiv]

Locations that are or were owned by, leased to, or otherwise possessed or used by the Department of Defense. The term does not include any operational range, operating storage or manufacturing facility, or facility that is used for or was permitted for the treatment or disposal of military munitions.

Discarded Military Munitions (DMM)[xv]

Military munitions that have been abandoned without proper disposal or removed from storage in a military magazine or other storage area for the purpose of disposal. The term does not include unexploded ordnance, military munitions that are being held for future use or planned disposal, or military munitions that have been properly disposed of, consistent with applicable environmental laws and regulations.

Disposal[xvi]

End of life tasks or actions for residual materials resulting from demilitarization or disposition operations.

Disposition[xvii]

The process of reusing, recycling, converting, redistributing, transferring, donating, selling, demilitarizing, treating, destroying, or fulfilling other life-cycle guidance, for DoD property.

Documentation of the Explosives Safety Status of Material[xviii]

Documentation attesting that material:
(1) does not present an explosive hazard and is consequently safe for unrestricted transfer within or release from DoD control, or
(2) is MPPEH, with the known or suspected explosive hazards stated, that is only transferable or releasable to a qualified receiver.
This documentation must be signed by a technically qualified individual with direct knowledge of:
(1) the results of both the material's 100 percent inspection and 100 percent re-inspection or of the approved process used and the appropriate level of re-inspection, and
(2) the veracity of the chain-of-custody for the material. This signature is followed by the signature of another technically qualified individual who inspects the

material on a sampling basis (sampling procedures are determined by DoD entity that is inspecting the material).

Environmental Regulators and Safety Officials[xix]

Include, but may not be limited to environmental regulators, environmental coordinators or hazardous material coordinators, law enforcement officers, and safety personnel of the U.S. Environmental Protection Agency (USEPA), American Indians and Alaska Natives, other Federal Land Managers, and/or the States. When appropriate, public health officials of various agencies may also be involved.

Explosive Hazard[xx]

A condition where danger exists because explosives are present that may react (e.g., detonate, deflagrate) in a mishap with potential unacceptable effects (e.g., death, injury, damage) to people, property, operational capability, or the environment.

Explosive Ordnance Disposal (EOD)[xxi]

The detection, identification, on-site evaluation, rendering safe, recovery, and final disposal of unexploded ordnance and of other munitions that have become an imposing danger, for example, by damage or deterioration.

Explosive Ordnance Disposal (EOD) Personnel[xxii]

Military personnel who have graduated from the Naval School, Explosive Ordnance Disposal; are assigned to a military unit with a Service-defined EOD mission; and meet Service and assigned unit requirements to perform EOD duties. EOD personnel have received specialized training to address explosive and certain CA hazards during both peacetime and wartime. EOD personnel are trained and equipped to perform Render Safe Procedures (RSP) on nuclear, biological, chemical, and conventional munitions, and on improvised explosive devices.

Explosive Ordnance Disposal (EOD) Unit[xxiii]

A military organization constituted by proper authority; manned with EOD personnel; outfitted with equipment required to perform EOD functions; and assigned an EOD mission.

Explosives or Munitions Emergency Response[xxiv]

All immediate response activities by an explosives and munitions emergency response specialist to control, mitigate, or eliminate the actual or potential threat encountered during an explosives or munitions emergency. An explosives or munitions emergency response may include in-place render-safe procedures, treatment or destruction of the explosives or munitions, and/or transporting those items to another location to be rendered safe, treated, or destroyed. Any

reasonable delay in the completion of an explosives or munitions emergency response caused by a necessary, unforeseen, or uncontrollable circumstance will not terminate the explosives or munitions emergency. Explosives and munitions emergency responses can occur on either public or private lands and are not limited to responses at RCRA facilities.

Explosives Safety[xxv]

A condition where operational capability and readiness, people, property, and the environment are protected from the unacceptable effects or risks or potential mishaps involving military munitions.

Former Range[xxvi]

Former range means the munitions response site is a location that was:
(1) Closed by a formal decision made by the DoD Component with administrative control over the location, or
(2) *Put to a use incompatible with the presence of UXO, DMM, or MC.*

Formerly Used Defense Sites (FUDS)[xxvii]

A FUDS is defined as a facility or site (property) that was under the jurisdiction of the Secretary of Defense and owned by, leased to, or otherwise possessed by the United States at the time of actions leading to contamination by hazardous substances. By the Department of Defense Environmental Restoration Program (DERP) policy, the FUDS program is limited to those real properties that were transferred from DoD control prior to 17 October 1986. FUDS properties can be located within the 50 States, District of Columbia, Territories, Commonwealths, and possessions of the United States.

Historical Evidence[xxviii]

Historical evidence means that the investigation:
(1) Found written documents or records, or
(2) Documented interviews of persons with knowledge of site conditions, or
(3) *Found and verified other forms of information.*

Inactive Range[xxix]

A military range that is not currently being used, but that is still under military control and considered by the military to be a potential range area, and that has not been put to a new use that is incompatible with range activities.

Interim Holding Facility (IHF)[xxx]

A temporary storage facility designed to hold recovered chemical warfare material (RCWM).

Land Use Controls (LUC)[xxxi]

LUC are physical, legal, or administrative mechanisms that restrict the use of, or limit access to, real property, to manage risks to human health and the environment. Physical Mechanisms encompass a variety of engineered remedies to contain or reduce contamination and/or physical barriers to limit access to real property, such as fences or signs.

Long-Term Management (LTM)[xxxii]

The period of site management (including maintenance, monitoring, record keeping, 5-year reviews, etc.) initiated after response (removal or remedial) objectives have been met (i.e., after Response Complete).

Material Potentially Presenting an Explosive Hazard (MPPEH)[xxxiii]

Material potentially containing explosives or munitions (e.g., munitions containers and packaging material; munitions debris remaining after munitions use, demilitarization, or disposal; and range-related debris); or material potentially contaminating a high enough concentration of explosives such that the material presents an explosive hazard (e.g., equipment, drainage systems, holding tanks, piping, ventilation ducts that were associated with munitions production, demilitarization or disposal operations). Excluded from MPPEH are munitions within DoD's established munitions management system and other hazardous items that may present explosion hazards (e.g., gasoline cans, compressed gas cylinders) that are not munitions and are not intended for use as munitions.

Military Munitions[xxxiv]

Military munitions means all ammunition products and components produced or used by the armed forces for national defense and security, including ammunition products or components under the control of the Department of Defense, the Coast Guard, the Department of Energy, and the National Guard. The term includes: confined gaseous, liquid, and solid propellants; explosives, pyrotechnics, chemical and riot control agents, smokes, and incendiaries, including bulk explosives, and chemical warfare agents; chemical munitions, rockets, guided and ballistic missiles, bombs, warheads, mortar rounds, artillery ammunition, small arms ammunition, grenades, mines, torpedoes, depth charges, cluster munitions and dispensers, demolition charges, and devices and components thereof.

The term does not include wholly inert items; improvised explosive devices; and nuclear weapons, nuclear devices, and nuclear components, other than nonnuclear components of nuclear devices that are managed under the nuclear weapons program of the Department of Energy after all required sanitization operations under the Atomic Energy Act of 1954 (42 U.S.C. 2011 et seq.) have been completed.

Military Munitions Burial Site[xxxv]

A site, regardless of location, where military munitions or CA, regardless of configuration, were intentionally buried, with the intent to abandon or discard. This term includes burial sites used to dispose of military munitions or CA, regardless of configuration, in a manner consistent with applicable environmental laws and regulations or the national practice at the time of burial. It does not include sites where munitions were intentionally covered with earth during authorized destruction by detonation, or where in-situ capping is implemented as an engineered remedy under an authorized response action.

Military Munitions Response Program (MMRP) Site[xxxvi]

A discrete location within a Munitions response Area (MRA) that may or may not require a munitions response.

Military Range[xxxvii]

Designated land and water areas set aside, managed, and used to conduct research on, develop, test, and evaluate military munitions and explosives, other ordnance, or weapon systems, or to train military personnel in their use and handling. Ranges include firing lines and positions, maneuver areas, firing lanes, test pads, detonation pads, impact areas, and buffer zones with restricted access and exclusionary areas.

Military Separation Distance (MSD)[xxxviii]

MSD is the distance at which personnel in the open must be from an intentional or unintentional detonation.

Munition Response Area (MRA)[xxxix]

Any area on a defense site that is known or suspected to contain UXO, DMM, or MC. Examples include former ranges and munitions burial areas. A munitions response area is comprised of one or more munitions response sites.

Munition Response Site (MRS)[xl]

A discrete location within a MRA that is known to require a munitions response.

Munition with the Greatest Fragmentation Distance (MGFD)[xli]

The munition with the greatest fragment distance that is reasonably expected (based on research or characterization) to be encountered in any particular area.

Munitions Constituents (MC) [xlii]

Any materials originating from unexploded ordnance (UXO), discarded military munitions (DMM), or other military munitions, including explosive and non-explosive materials, and emission, degradation, or breakdown elements of such ordnance or munitions.

Munitions Debris[xliii]

Remnants of munitions (e.g., fragments, penetrators, projectiles, shell casings, links, fins) remaining after munitions use, demilitarization, or disposal.

Munitions and Explosives of Concern (MEC)[xliv]

This term, which distinguishes specific categories of military munitions that may pose unique explosives safety risks, means:
(a) Unexploded Ordnance (UXO), as defined in 10 U.S.C. 1(e)(5);
(b) Discarded military munitions (DMM), as defined in 10 U.S.C. 2710 (e)(2); or
(c) Munitions constituents (e.g., TNT, RDX) as defined in 10 U.S.C. 2710(e)(3), present in high enough concentrations to pose an explosive hazard.

Munitions Response[xlv]

Response actions, including investigation, removal actions and remedial actions to address the explosives safety, human health, or environmental risks presented by unexploded ordnance (UXO), discarded military munitions (DMM), or munitions constituents (MC), or to support a determination that no removal or remedial action is required.

Mutual Agreement[xlvi]

A meeting of the minds on a specific subject, and a manifestation of intent of the parties to do or refrain from doing some specific act or acts. Inherent in any mutual agreement or collaborative process are the acknowledgement of each member's role in the process and their differing views of their authorities. The mutual agreement process will provide a means of resolving differences without denying the parties an opportunity to exercise their respective authorities should mutual agreement fail to be achieved.

One Percent Lethality Distance[xlvii]

A distance calculated from a given CA Maximum Credible Event (MCE) and meteorological conditions (temperature, wind speed, Pasquill stability factor) and established as the distance at which dosage from that MCE agent release would be 150 mg-min/m^3 for H and HD agents, 75 mg-min/m^3 for HT agent, 150 mg-min/m^3 for Lewisite, 10 mg-min/m^3 for GB agent, 4.3 mg-min/m^3 for VX vapor, and 0.1 mg-min/m^3 for inhalation and deposition of liquid VX.

On-call Construction Support[xlviii]

Construction support provided, on an as needed basis, where the probability of encountering UXO, other munitions that may have experienced abnormal environments (e.g., DMM), munitions constituents in high enough concentrations to pose an explosive hazard, or CA, regardless of configuration, has been determined to be low. This support can respond from off-site when called, or be on-site and available to provide required construction support.

On-Site Construction Support[xlix]

Dedicated construction support, where the probability of encountering UXO, other munitions that may have experienced abnormal environments (e.g., DMM), munitions constituents in high enough concentrations to pose an explosive hazard, or CA, regardless of configuration, has been determined to be moderate to high.

On-the-Surface[l]

A situation in which UXO, DMM or CA, regardless of configuration, are: (A) entirely or partially exposed above the ground surface (i.e., the top of the soil layer); or (B) entirely or partially exposed above the surface of a water body (e.g., because of tidal activity).

Open Burn (OB)[li]

An open-air combustion process by which excess, unserviceable, or obsolete munitions are destroyed to eliminate their inherent explosive hazards.

Open Detonation (OD)[lii]

An open-air process used for the treatment of excess, unserviceable or obsolete munitions whereby an explosive donor charge initiates the munitions being treated.

Operational Range[liii]

A range that is under the jurisdiction, custody, or control of the Secretary of Defense and that is used for range activities; or although not currently being used for range activities, that is still considered by the Secretary to be a range and has not been put to a new use that is incompatible with range activities. (10 U.S.C. 101(e)(3)(A) and (B)). Also includes "military range," "active range," and "inactive range" as those terms are defined in 40 CFR 266.201.

Ordnance and Explosives (OE) [liv]

Anything related to munitions designed to cause damage to personnel or material through explosive force, incendiary action or toxic effects. OE is: bombs and warheads, missiles; artillery, mortar and rocket ammunition, small arms ammunition; antipersonnel and antitank mines; demolition charges; high explosives and propellants; depleted uranium rounds; military chemical warfare materials as defined [below]; and all similar and related items or components, explosive in nature or otherwise designed to cause damage to personnel or material (e.g., fuze, boosters/propellants or soils/media contaminated with explosives if the concentration is sufficient to be reactive.) . . .Unexploded Ordnance (UXO) is an item of explosive ordnance which has failed to function as designed or has been abandoned, discarded or improperly disposed of and is still capable of functioning, causing damage to personnel or material.

Other Than Operational Range

Replaces the previous definitions for Closed, Transferring, or Transferred ranges

Physical Evidence[lv]

Physical evidence means:

(1) *Recorded observations from on-site investigations, such as finding intact UXO or DMM, or components, fragments, or other pieces of military munitions, or*

(2) *The results of field or laboratory sampling and analysis procedures, or*

(3) *The results of geophysical investigations.*

Primary Explosives[lvi]

Primary explosives are highly sensitive compounds that are typically used in detonators and primers. A reaction is easily triggered by heat, spark, impact or friction. Examples of primary explosives are lead azide and mercury fulminate.

Public Access Exclusion Distance (PAED)[lvii]

The PAED is defined as longest distance of the hazardous fragment distance, inhabited building distance (IBD) for overpressure, or the One Percent Lethality Distance. For siting purposes, the PAED is analogous to the IBD for explosives; therefore, personnel not directly associated with the chemical operations are not to be allowed within the PAED.

Qualified Receiver[lviii]

Entities that have personnel who are, or individuals who are, trained and experienced in the identification and safe handling of used and unused military munitions, and any known or potential explosive hazards that may be associated with the MPPEH they receive; and are licensed and permitted or otherwise qualified to receive, manage, and process MPPEH.

Range[lix]

A designated land or water area that is set aside, managed, and used for range activities of the Department of Defense. The term includes firing lines and positions, maneuver areas, firing lanes, test pads, detonation pads, impact areas, electronic scoring sites, buffer zones with restricted access, and exclusionary areas. The term also includes airspace areas designated for military use in accordance with regulations and procedures prescribed by the Administrator of the Federal Aviation Administration.

Range Activities[lx]

Research, development, testing, and evaluation of military munitions, other ordnance, and weapons systems; and the training of members of the armed forces in the use and handling of military munitions, other ordnance, and weapons systems.

Range Clearance[lxi]

The destruction, or removal and proper disposition of used military munitions (e.g., unexploded ordnance (UXO) and munitions debris) and other range-related debris (e.g., target debris, military munitions packaging and crating material) to maintain or enhance operational range safety or prevent the accumulation of such material from impairing or preventing operational range use. "Range clearance" does not include removal, treatment, or remediation of chemical residues or munitions constituents from environmental media, nor actions to address discarded military munitions (e.g., burial pits) on operational ranges.

Range Related Debris[lxii]

Debris, other than munitions debris, collected from operational ranges or from former ranges (e.g., target debris, military munitions packaging and crating material).

Recovered Chemical Warfare Materiel (RCWM)[lxiii]

CWM used for its intended purpose or previously disposed of as waste, which has been discovered during a CWM response or by chance (e.g., accidental discovery by a member of the public), that DoD has either secured in place or placed under DoD control, normally in a DDESB-approved storage location or interim holding facility, pending final disposition.

Render Safe Procedures (RSP)[lxiv]

The portion of EOD procedures that involves the application of special disposal methods or tools to interrupt the functioning or otherwise defeat the firing train of UXO from triggering an unacceptable detonation.

Secondary Explosives[lxv]

Secondary explosives are generally less sensitive to initiation than primary explosives and are typically used in booster and main charge applications. A severe shock is usually required to trigger a reaction. Examples are TNT, cyclo-1,3,5-trimethylene-2,4,6-trinitramine (RDX or cyclonite), HMX, and tetryl.

Small Arms Ammunition[lxvi]

Ammunition, without projectiles that contain explosives (other than tracers) that is .50 caliber or smaller, or for shotguns.

Team Separation Distance (TSD)[lxvii]

The distance that munitions response teams must be separated from each other during munitions response activities involving intrusive operations.

Technical Escort Unit (TEU)[lxviii]

A DoD organization manned with specially trained personnel that provide verification, sampling, detection, mitigation, render safe, decontamination, packaging, escort and remediation of chemical, biological and industrial devices or hazardous material.

Technology-aided Surface Removal[lxix]

A removal of UXO, DMM or CWM on the surface (i.e., the top of the soil layer) only, in which the detection process is primarily performed visually, but is augmented by technology aids (e.g., hand-held magnetometers or metal detectors) because vegetation, the weathering of UXO, DMM or CWM, or other factors make visual detection difficult.

Time Critical Removal Action (TCRA) [lxx]

Removal actions where, based on the site evaluation, a determination is made that a removal is appropriate, and that less than 6 months exists before on-site removal activity must begin.

Transferred range[lxxi]

A military range that is no longer under military control and has been leased, transferred, or returned to another entity, including Federal entities. This includes a military range that is no longer under military control but was used under the terms of a withdrawal, executive order, special-use permit or authorization, right-of-way, public land order, or other instrument issued by the Federal land manager.

Transferring Range[lxxii]

A military range that is proposed to be leased, transferred, or returned from the Department of Defense to another entity, including Federal entities. This includes a military range that is used under the terms of a withdrawal, executive order, special-use permit or authorization, right-of-way, public land order, or other instrument issued by the Federal land manager. An active range will not be considered a ``transferring range'' until the transfer is imminent.

Unexploded Ordnance (UXO) [lxxiii]

Military munitions that:

(a) Have been primed, fuzed, armed, or otherwise prepared for actions;

(b) Have been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to operations, installations, personnel, or material; and

(c) *Remain unexploded whether by malfunction, design, or any other cause.*

UXO Technicians[lxxiv]

Personnel who are qualified for and filling Department of Labor, Service Contract Act, Directory of Occupations, contractor positions of UXO Technician I, UXO Technician II, and UXO Technician III.

UXO-Qualified Personnel[lxxv]

Personnel who have performed successfully in military EOD positions, or are qualified to perform in the following Department of Labor, Service Contract Act, Directory of Occupations, contractor positions: UXO Technician II, UXO Technician III, UXO Safety Officer, UXO Quality Control Specialist, or Senior UXO Supervisor.

Venting[lxxvi]

Exposing any internal cavities of MPPEH, to include training or practice munitions (e.g., concrete bombs), using DDESB- or DoD Component-approved procedures, to confirm that an explosive hazard is not present.

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[i] Environmental Protection Agency, Military Munitions Rule, published 12 February 1997 (62 FR 6622)

[ii] Department of the Army Office of the Assistant Secretary Installations and Environment, Memorandum for the Assistant Chief of Staff For Installation Management, Subject: Munitions Response Terminology, 21 April 2005. (Hereafter Memorandum, Subject: Munitions Response Terminology, 21 April 2005.)

[iii] Memorandum, Subject: Munitions Response Terminology, 21 April 2005.

[iv] Corps of Engineers Safety Office (CESO), *ER 385-1-92, Safety - Safety and Occupational Health Requirements for Hazardous, Toxic, and Radioactive Waste (HTRW) Activities*, 1 September 2000

[v] Memorandum, Subject: Munitions Response Terminology, 21 April 2005.

[vi] Department of Defense, Munitions Response Site Prioritization Protocol; Proposed Rule, 22 August 2003; 32 CFR Part 179

[vii] Memorandum, Subject: Munitions Response Terminology, 21 April 2005.

[viii] Corps of Engineers Safety Office (CESO), *ER 385-1-92, Safety - Safety and Occupational Health Requirements for Hazardous, Toxic, and Radioactive Waste (HTRW) Activities*, 1 September 2000

[ix] Department of Defense, Munitions Response Site Prioritization Protocol; Proposed Rule, 22 August 2003; 32 CFR Part 179

[x] Memorandum, Subject: Munitions Response Terminology, 21 April 2005.

[xi] Originally defined in the 26 September 1997 DOD proposed range rule, *Closed, Transferred, and Transferring Ranges Containing Military Munitions*, Title 32 Code of Federal Regulations (CFR) Part 178, which the DoD withdrew on 13 November 2000.

[xii] Memorandum, Subject: Munitions Response Terminology, 21 April 2005.

[xiii] *Ibid*.

[xiv] 10 U.S.C. 2710(e)(1)

[xv] 10 U.S.C. 2710(e)(2)

[xvi] Memorandum, Subject: Munitions Response Terminology, 21 April 2005.

[xvii] *Ibid.*

[xviii] *Ibid*.

[xix] *Ibid*.

[xx] *Ibid*.

[xxi] *Ibid*.

[xxii] *Ibid*.

[xxiii] *Ibid*.

[xxiv] Military Munitions Rule, 40 CFR 260.10

[xxv] Memorandum, Subject: Munitions Response Terminology, 21 April 2005.

[xxvi] Department of Defense, Munitions Response Site Prioritization Protocol; Proposed Rule, 22 August 2003; 32 CFR Part 179

[xxvii] Department of the Army, U.S. Army Corps of Engineers, Environmental Quality, Formerly Used Defense Sites (FUDS) Program Policy, ER 200-3-1, dated 20May2004.

[xxviii] Department of Defense, Munitions Response Site Prioritization Protocol; Proposed Rule, 22 August 2003; 32 CFR Part 179

[xxix] Environmental Protection Agency, Military Munitions Rule, published 12 February 1997 (62 FR 6622)

[xxx] Memorandum, Subject: Munitions Response Terminology, 21 April 2005.

[xxxi] *Ibid*.

[xxxii] *Ibid*.

[xxxiii] Department of the Army Office of the Assistant Secretary Installations and Environment, Memorandum for the Assistant Chief of Staff For Installation Management, Subject: Definition Related to Munitions Response Action, 28 October 2003:

[xxxiv] 10 U.S.C. 101(e)(4)(A) through (C)

[xxxv] Memorandum, Subject: Munitions Response Terminology, 21 April 2005.

[xxxvi] U.S. Army Corps of Engineers-St. Louis District, Ordnance and Technical Services Branch CEMVS-ED-P developed this term in lieu of using Munitions Response Site (MRS)

[xxxvii] Military Munitions Rule, 40 CFR 266.201

[xxxviii] Memorandum, Subject: Munitions Response Terminology, 21 April 2005.

[xxxix] *Ibid.*

[xl] *Ibid*.

[xli] *Ibid.*

[xlii] 10 U.S.C. 2710(e)(3)

[xliii] Memorandum, Subject: Munitions Response Terminology, 21 April 2005.

[xliv] *Ibid*.

[xlv] *Ibid*.

[xlvi] *Ibid.*

[xlvii] *Ibid*.

[xlviii] *Ibid*.

[xlix] *Ibid*.

[l] *Ibid.*

[li] *Ibid.*

[lii] *Ibid.*

[liii] *Ibid.*

[liv] Corps of Engineers Safety Office (CESO), *ER 385-1-92, Safety - Safety and Occupational Health Requirements for Hazardous, Toxic, and Radioactive Waste (HTRW) Activities*, 1 September 2000

[lv] Department of Defense, Munitions Response Site Prioritization Protocol; Proposed Rule, 22 August 2003; 32 CFR Part 179

[lvi] Memorandum, Subject: Munitions Response Terminology, 21 April 2005.

[lvii] *Ibid.*

[lviii] *Ibid.*

[lix] 10 U.S.C. 101(e)(1)(A) and (B)

[lx] 10 U.S.C. 101(e)(2)(A) and (B)

[lxi] Department of the Army Office of the Assistant Secretary Installations and Environment, Memorandum for the Assistant Chief of Staff For Installation Management, Subject: Definition Related to Munitions Response Action, 28 October 2003:

[lxii] *Ibid.*

[lxiii] U. S. Army Corps of Engineers (CESO-I)
2003 *ER 385-1-95, Safety - Safety and Health Requirements for Ordnance and Explosives (OE) Operations*, 16 June 2003

[lxiv] Memorandum, Subject: Munitions Response Terminology, 21 April 2005.

[lxv] *Ibid.*

[lxvi] Department of Defense, Munitions Response Site Prioritization Protocol; Proposed Rule, 22 August 2003; 32 CFR Part 179

[lxvii] Memorandum, Subject: Munitions Response Terminology, 21 April 2005.

[lxviii] *Ibid*.

[lxix] *Ibid*.

[lxx] *40 CFR 300.5*

[lxxi] Originally defined in the 26 September 1997 DOD proposed range rule, *Closed, Transferred, and Transferring Ranges Containing Military Munitions*, Title 32 Code of Federal Regulations (CFR) Part 178, which the DoD withdrew on 13 November 2000.

[lxxii] *Ibid*.

[lxxiii] 10 U.S.C. 101(e)(5)(A) through (C)

[lxxiv] Memorandum, Subject: Munitions Response Terminology, 21 April 2005.

[lxxv] *Ibid*.

[lxxvi] *Ibid*.

APPENDIX E

ABBREVIATED PRELIMINARY ASSESSMENT CHECKLIST

Prepared in Accordance with: Improving Site Assessment: Abbreviated Preliminary Assessment, EPA-540-F-98-037, October 1999

ABBREVIATED PRELIMINARY ASSSESSMENT CHECKLIST

This checklist can be used to help the site investigator determine if an Abbreviated Preliminary Assessment (APA) is warranted. This checklist should document the rationale for the decision on whether further steps in the site investigation process are required under CERCLA. Use additional sheets, if necessary.

September 2015

Checklist Preparer:

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Completed for:

U.S. Army Corps of Engineers – New York District
Jacob K. Javits Federal Building
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New York, NY 10278-0098

Site Name: ***Floyd Bennett Field***

Previous Names (if any): *Naval Air Station, New York*

Site Location: *Brooklyn (Jamaica Bay), New York 11234*

Latitude: *N 40° 35' 27"* **Longitude**: *W 73° 53' 25"*

Describe the release (or potential release) and its probable nature: *MC potential in the form of expended small arms projectiles and PAH exists from former small arms range activities (i.e. skeet ranges, pistol ranges, and gun test backstop). More complete information is included in the accompanying APA report.*

PART 1 – SUPERFUND ELIGIBILITY EVALUATION

If all answers are "no" go on to Part 2, otherwise proceed to Part 3.		**YES**	**NO**
1.	Is the site currently in CERCLIS or an "alias" of another site?		X
2.	Is the site being addressed by some other remedial program (Federal, State, or Tribal)?		X
3.	Are the hazardous substances potentially released at the site regulated under a statutory exclusion (e.g., petroleum, natural gas, natural gas liquids, synthetic gas usable for fuel, normal application of fertilizer, release located in a workplace, naturally occurring, or regulated by the NRC, UMTRCA, or OSHA)?		X
4.	Are the hazardous substances potentially released at the site excluded by policy considerations (i.e., deferred to RCRA corrective action)?		X
5.	Is there sufficient documentation to demonstrate that no potential for a release that could cause adverse environmental or human health impacts exists (e.g., comprehensive remedial investigation equivalent data showing no release above ARARs, completed removal action, documentation showing that no hazardous substance releases have occurred, or an EPA approved risk assessment completed)?		X

Please explain all "yes" answer(s): *Not Applicable.*

NOTE: The response for question #2 is "NO" for MMRP only; HTRW and CON/HTRW investigation and remediation activities are ongoing at the FUDS.

PART 2– INITIAL SITE EVALUATION

For Part 2, if information is not available to make a "yes" or "no" response, further investigation may be needed. In these cases, determine whether an APA is appropriate. Exhibit 1 parallels the questions in Part 2. Use Exhibit 1 to make decisions in Part 3.

If the answer is "no" to any of questions 1, 2, or 3, proceed directly to Part 3.		**YES**	**NO**
1.	Does the site have a release or a potential for release?	X	
2.	Does the site have uncontained sources containing CERCLA eligible substances?	X	
3.	Does the site have documented on-site, adjacent, or nearby targets?	X	

If the answers to questions 1, 2, and 3 above were all "yes" then answer the questions below before proceeding to Part 3.		**YES**	**NO**
4.	Does documentation indicate that a target (e.g., drinking water wells, drinking surface water intakes, etc.) has been exposed to a hazardous substance released from the site?	*No*	
5.	Is there an apparent release at the site with no documentation of exposed targets, but there are targets on site or immediately adjacent to the site?	*Yes*	
6.	Is there an apparent release and no documented on-site targets or targets immediately adjacent to the site, but there are nearby targets (e.g., targets within 1 mile)?	*No*	
7.	Is there no indication of a hazardous substance release, and there are uncontained sources containing CERCLA hazardous substances, but there is a potential to release with targets present on site or in proximity to the site?	*No*	

Notes: *MC potential in the form of expended small arms projectiles and PAH exists from former small arms range activities (i.e. skeet ranges, pistol ranges, and gun test backstop). More complete information is included in the accompanying APA report.*

EXHIBIT 1
SITE ASSESSMENT DECISION GUIDELINES FOR A SITE

This Exhibit is taken from EPA guidance titled *Improving Site Assessment: Abbreviated Preliminary Assessments*, OSWER 9375.2-09FS (EPA 1999). It identifies different types of site information and provides some possible recommendations for further site assessment activities based on that information. Based on the answers to the questions in Part 2 of the APA Checklist, Exhibit 1 is used to determine the need for further action at the site. The guidance document acknowledges that professional judgment may be used and that the general recommendations for a site may be different than those given below.

Suspected/Documented Site Conditions			APA	Full PA	PA/SI	SI
1.	There are no releases or potential to release.		Yes	No	No	No
2.	No uncontained sources with CERCLA-eligible substances are present on site.		Yes	No	No	No
3.	There are no on-site, adjacent, or nearby targets.		Yes	No	No	No
4.	There is documentation indicating that a target (e.g., drinking water wells, drinking surface water intakes, etc.) has been exposed to a hazardous substance released from the site.	Option 1: APA or SI	Yes	No	No	Yes
		Option 2: PA/SI	No	No	Yes	N/A
5.	**There is an apparent release at the site with no documentation of exposed targets, but there are targets on site or immediately adjacent to the site.**	**Option 1: APA or SI**	**Yes**	**No**	**No**	**Yes**
		Option 2: PA/SI	No	No	Yes	N/A
6.	There is an apparent release and no documented on-site targets and no documented targets immediately adjacent to the site, but there are nearby targets. Nearby targets are those targets that are located within 1 mile of the site and have a relatively high likelihood of exposure to a hazardous substance migration from the site.		No	Yes	No	No
7.	There is no indication of a hazardous substance release, and there are uncontained sources containing CERCLA hazardous substances, but there is a potential to release with targets present or in proximity to the site.		No	Yes	No	No

PART 3 – SITE ASSESSMENT DECISION

When completing Part 3, use Part 2 and Exhibit 1 to select the appropriate decision. For example, if the answer to question 1 in Part 2 was "no," then an APA may be performed and the "NFRAP" box below should be checked. Additionally, if the answer to question 4 in Part 2 is "yes," then you have two options (as indicated in Exhibit 1): Option 1 --conduct an APA and check the "Lower Priority SI" or "Higher Priority SI" box below; or Option 2 -- proceed with a combined PA/SI assessment.

Check the box that applies based on the conclusions of the APA:

□	NFRAP	□	Refer to Removal Program – further site assessment needed
□	Higher Priority SI	□	Refer to Removal program – NFRAP
■	**Lower Priority SI**	□	Site is being addressed as part of another CERCLIS site
□	Defer to RCRA Subtitle C	□	Other:
□	Defer to NRC		

Regional EPA Reviewer:

Print Name/Signature Date

PLEASE EXPLAIN THE RATIONALE FOR YOUR DECISION: *Further investigation may be warranted since evidence exists that the property was used for small arms practice at multiple ranges (skeet, trap, rifle, pistol, and gun test backstop) on the FUDS. However, many of the known or suspected range locations are covered with pavement or vegetation and shoreline portions have eroded from storms. Munitions Related Areas of Interest (MRAOIs) have been identified in the accompanying APA report for determination of appropriate further action.*

NOTES: *More complete information is included in the accompanying APA report.*

APPENDIX F

ORDNANCE TECHNICAL DATA SHEETS

ORDNANCE TECHNICAL DATA SHEETS

The following Ordnance Technical Data Sheets represent typical examples of munition items associated with Floyd Bennett Field. These are general descriptions and may not include all the specific variations of a particular ammunition item. This list is compiled from information found regarding Floyd Bennett Field and may not be comprehensive. Many of the data sheets were prepared under previous projects and may not contain the most complete available data or references. Additionally, Ordnance Technical Data Sheets have not been developed for all munitions.

Page No. **Ordnance Technical Data Sheets**[1]

Small Arms

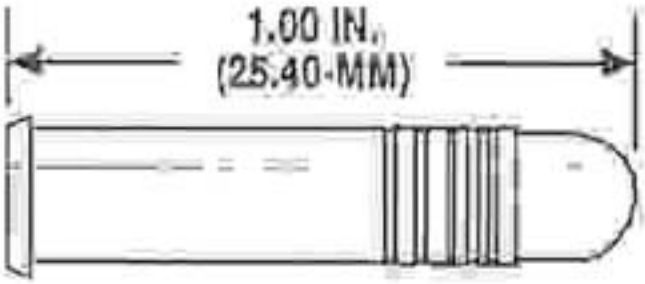
Page No. **Physical and Chemical Characteristics Data Sheets**

Chemical Warfare Material

[1] All Ordnance Technical Data Sheets are prepared by U.S. Army Corps of Engineers, St. Louis District, Environmental and Munitions Branch, Engineering Division.

MUNITIONS TECHNICAL DATA SHEETS
SMALL ARMS

Cartridge, Caliber .22, Ball



Historical notes: This cartridge dates back to about 1887, when it was loaded with black powder. Remington modernized it into a high-velocity, smokeless powder round in 1930. It is the most accurate rimfire cartridge in existence and is a popular match and varmint-hunting cartridge. It can be fired in a variety of rifles and handguns, mostly for target shooting; however, during World War II, the M3 and M4 fully automatic, belt-fed machine gun trainers used this cartridge for anti-aircraft training. In addition to the military M24 cartridge, the U.S. military procures commercially made caliber .22 cartridges. Commercially, it is known as ".22 Long Rifle."

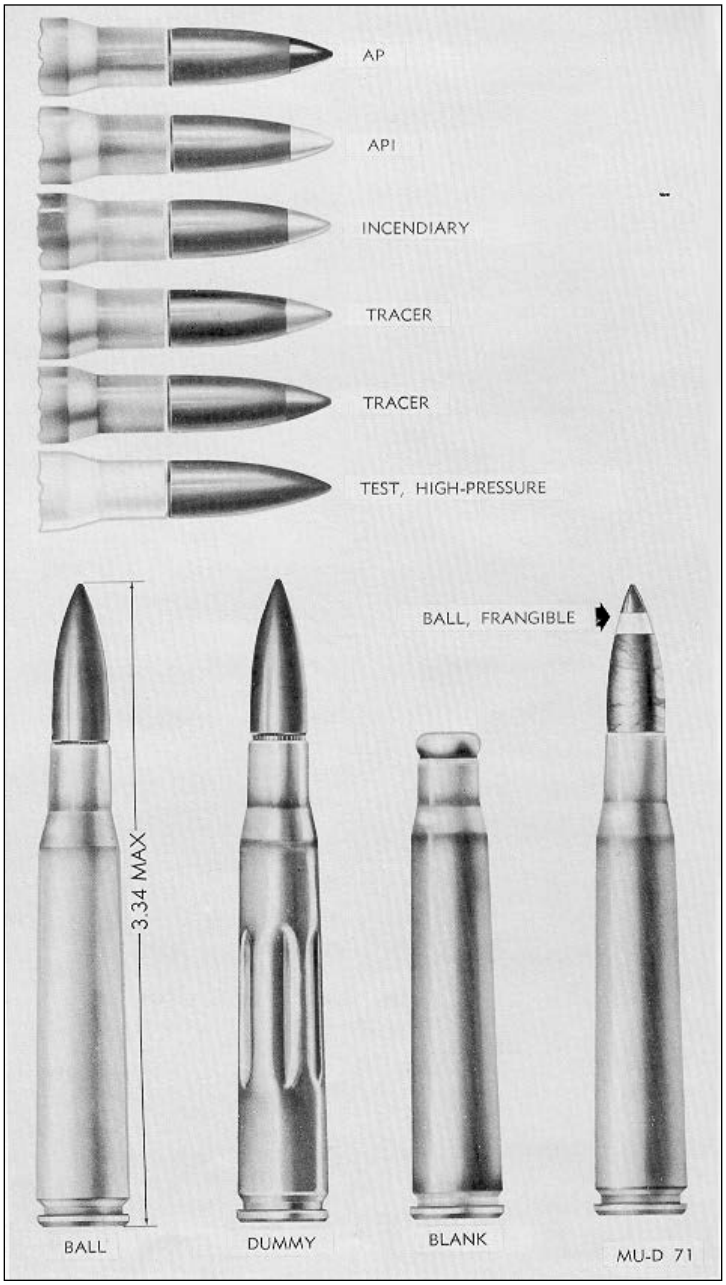
Components: The complete round, or cartridge, consists of a rimfire case, a primer, a propelling charge, and a bullet. The case is brass and the primer is contained within the rim (as opposed to a center-fire primer, which a separate component). The primer is a small charge of sensitive explosive suitable for ignition of the smokeless powder used as a propelling charge. The weight of the bullet is normally 40 grains and is made of a lead/antimony alloy. The bullet of the M24 cartridge has a gilding metal jacket.

Length ..... 1.00 inch
Diameter (of bullet)..... .22 inch

References:

TM 9-1990, Small Arms Ammunition, 23 May 1942
Primer, Pyrotechnic, and Incendiary Compositions for Small Arms Ammunition, Frankford Arsenal, October 1954
TM 9-1305-200, Small Arms Ammunition, 14 June 1961
Small Arms Ammunition Pamphlet, 23-1, Frankford Arsenal, August 1968
TM 43-0001-27, Army Ammunition Data Sheets, Small Arms, June 1981
U.S. Army Defense Ammunition Center and School, Explosives and Propellants Reference Guide, April 1994

Cartridge, Caliber .30



Small Arms General. In general, a small-arms cartridge is identified as an assembly of a cartridge case, primer, a quantity of propellant within the cartridge case, and a bullet or projectile. Blank cartridges are sealed with paper closure disks in lieu of bullets. Dummy cartridges are composed of a cartridge case and a bullet.

Case. Although steel, aluminum, zinc and plastic materials have been used experimentally, brass, a composition of 70 % copper and 30% zinc, is the most commonly used material for cartridge cases.

Propellant. Cartridges are loaded with varying weights of propellant. This is to impart sufficient velocity to the projectile to obtain the required ballistic performance. These propellants are either of the single base (nitrocellulose) or double base (nitrocellulose & nitroglycerine) type. The propellant grain configuration may be cylindrical with a single, lengthwise perforation, spheroid (ball) or flake. Most propellants are coated with a deterrent (to assist in controlling the rate of combustion) and with a final coating of graphite (to facilitate flow of propellant and eliminate static electricity in loading cartridges).

Primer. Cartridges contain a percussion primer. The percussion primer of brass or gilding metal cup that contains a pellet of sensitive explosive material secured by a paper disk and a brass anvil. Most primers loaded after 1950 were non-corrosive and contain lead styphnate.

Bullets.

Armor-Piercing. The bullet consists of three parts: a gliding metal jacket, a hardened alloy steel core, gliding metal base filler, a point filler of lead "T" shot. The tip is painted black.

Armor-Piercing Incendiary. The bullet is similar to the armor-piercing bullet, except that the point filler is incendiary mixture instead of lead. The tip is painted white.

Ball. The bullet consists of either a lead alloy or common steel core or slug that is covered with a gilding metal jacket. The bullet is unpainted.

Blank. The cartridge is identified by the absence of a bullet and has a crimped cartridge case mouth. It is used for training.

Dummy. The cartridge is completely inert. The cartridge is identified by the 6 1-inch longitudinal corrugations. In addition, there is no primer.

Frangible. The bullet is a bakelite material. The tip is painted green with a white stripe. The bullet breaks up into dust upon impact with a hard target and is useful in training.

Grenade. The cartridge is identified by the rose-petal (rosette-crimped) closure of the cartridge case mouth. It is used for launching rifle grenades.

Incendiary. The bullet consists of gliding metal jacket, a hollow steel cylindrical core, an incendiary composition, and a lead base filler. The tip is painted light blue. The bullet will ignite combustible materials upon impact. The manufacture of this type of ammunition in caliber .30 was halted in November of 1943.

High Pressure Test. The cartridge case is distinguished from other cartridges by the tinned cartridge case. The bullet consists of a gliding metal jacket and a core made up of 2 slugs, a front and rear slug. It is only used in controlled conditions, such as a rebuild or overhaul facility.

Tracer. The bullet is the similar to the Ball with the addition of a tracer and igniter composition. The tip is painted red-orange on cartridges from 1930 onward. The tracer ignites upon firing and can be seen at night by the shooter.

Historical Notes. The caliber .30 military cartridge (known commercially as the .30-06) was adopted in 1906 for the M1903 Springfield rifle. The original 1903 design for this rifle used a 220-grain round-nosed bullet, but this was found unsatisfactory and the case was shortened and pointed bullets adopted. A 1906 loading used a 150-grain bullet, but in 1926 a 172-grain bullet was adopted as Cartridge, Ball, caliber .30, M1. In 1940, the 150-grain (nominal) bullet was readopted as Cartridge, Ball, caliber .30, M2.

Weapons Used In. In addition to the M1903 Springfield rifle, the M1917 rifle, often called the "American Enfield," also chambered this cartridge. In 1936, the M1 "Garand" rifle was selected for adoption. The Garand, the M1918 Browning Automatic Rifle (BAR) and the M1919 series of belt-fed machine guns saw use during World War II and the Korean War.

References:

-Specifications Governing the Manufacture and Inspection of U.S. Caliber .30 Rifle Cartridges Model of 1906, 28 JUN 17
-TR 1370-A, Ammunition, General, 24 March 1930
-TR 1350-A, Infantry and Aircraft Ammunition: Ammunition for Small Arms and Automatic Guns, 18 May 1934
-O. O. Form 7224, Ordnance Safety Manual, 1 December 1941
-TM 9-1990, Small Arms Ammunition, 23 May 1942
-History of Modern U.S. Military Small Arms Ammunition, Vol. I 1880-1939, F.W. Hackley (undated)
-Catalogue of Standard Ordnance Items, Second Edition, Volume III, Office of the Chief of - Ordnance Technical Division, 15 JAN 44
-TM 9-1904, Ammunition Inspection Guide, 2 March 1944
-TM 9-1990, Small Arms Ammunition, 15 September 1947
-Primer, Pyrotechnic, and Incendiary Compositions for Small Arms Ammunition, Frankford Arsenal, October 1954
-TM 9-1900, Ammunition General, June 1956
-Frankford Arsenal Report No. R-1407-1, Small Arms Incendiary Ammunition, A Review of the History and Development, Vol. 1, Chapters I,II,III, December 1956
-Complete Round Charts, Book I, Small Arms Ammunition, 1 May 1959
-TM 9-1305-200, Small Arms Ammunition, 14 June 1961
-Small Arms Ammunition Pamphlet, 23-1, Frankford Arsenal, August 1968
-TM 43-0001-27, Army Ammunition Data Sheets, Small Arms, June 1981
-U.S. Army Defense Ammunition Center and School, Explosives and Propellants Reference Guide, April 1994
-Cartridges of the World, 10th Edition, Frank C. Barnes, Kraus Publications, 2003
-U.S. Army Defense Ammunition Center's "MIDAS" web site

Cartridge, Caliber .30 Carbine

Small Arms, General. In general, a small-arms cartridge is identified as an assembly of a cartridge case, primer, a quantity of propellant within the cartridge case, and a bullet or projectile. Blank cartridges are sealed with paper closure disks in lieu of bullets. Dummy cartridges are composed of a cartridge case and a bullet.

Case. Although steel, aluminum, zinc and plastic materials have been used experimentally, brass, a composition of 70 % copper and 30% zinc, is the most commonly used material for cartridge cases.

Propellant. Cartridges are loaded with varying weights of propellant. This is to impart sufficient velocity to the projectile to obtain the required ballistic performance. These propellants are either of the single base (nitrocellulose) or double base (nitrocellulose & nitroglycerine) type. The propellant grain configuration may be cylindrical with a single, lengthwise perforation, spheroid (ball) or flake. Most propellants are coated with a deterrent (to assist in controlling the rate of combustion) and with a final coating of graphite (to facilitate flow of propellant and eliminate static electricity in loading cartridges).

Primer. Cartridges contain a percussion primer. The percussion primer of brass or gilding metal cup that contains a pellet of sensitive explosive material secured by a paper disk and a brass anvil. Most primers loaded after 1950 were non-corrosive and contain lead styphnate.

Bullets.

Ball. The bullet consists of either a lead alloy or common steel core or slug that is covered with a gilding metal jacket. The bullet is unpainted.

Blank. The cartridge is identified by the absence of a bullet and has a crimped cartridge case mouth. It is used for training.

Dummy. The cartridge is completely inert. The cartridge is identified by the 2 holes drilled in the cartridge case. In addition, there is no primer.

Grenade. The cartridge is identified by the rose-petal (rosette-crimped) closure of the cartridge case mouth. It is used for launching rifle grenades.

High Pressure Test. The cartridge case is distinguished from other cartridges by the tinned cartridge case. The bullet consists of a gliding metal jacket and a core made up of 2 slugs, a front and rear slug. It is only used in controlled conditions, such as a rebuild or overhaul facility.

Tracer. The bullet is the similar to the Ball with the addition of a tracer and igniter composition. The tip is painted red-orange on cartridges from 1930 onward. The tracer ignites upon firing and can be seen at night by the shooter.

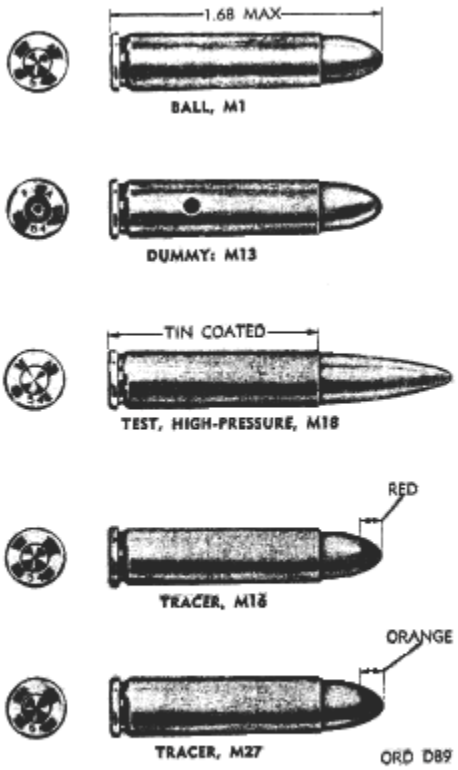


Figure 23. Caliber .30 carbine ammunition.

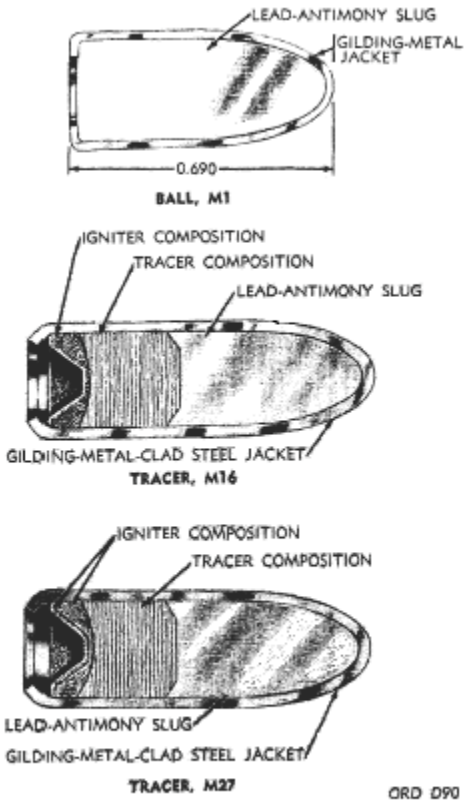
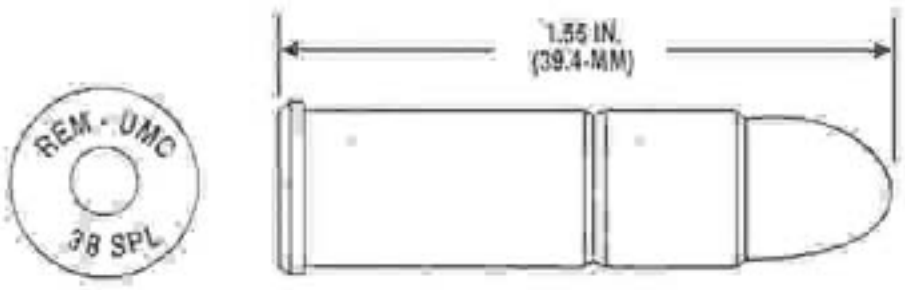


Figure 24. Caliber .30 carbine bullets—sectioned.

References:

O. O. Form 7224, Ordnance Safety Manual, 1 December 1941
TM 9-1990, Small Arms Ammunition, 23 May 1942
History of Modern U.S. Military Small Arms Ammunition, Vol. I 1880-1939, F.W. Hackley (undated)
Catalogue of Standard Ordnance Items, Second Edition, Volume III, Office of the Chief of Ordnance Technical Division, 15 JAN 44
TM 9-1904, Ammunition Inspection Guide, 2 March 1944
TM 9-1990, Small Arms Ammunition, 15 September 1947
Primer, Pyrotechnic, and Incendiary Compositions for Small Arms Ammunition, Frankford Arsenal, October 1954
TM 9-1900, Ammunition General, June 1956
Frankford Arsenal Report No. R-1407-1, Small Arms Incendiary Ammunition, A Review of the History and Development, Vol. 1, Chapters I,II,III, December 1956
Complete Round Charts, Book I, Small Arms Ammunition, 1 May 1959
TM 9-1305-200, Small Arms Ammunition, 14 June 1961
Small Arms Ammunition Pamphlet, 23-1, Frankford Arsenal, August 1968
TM 43-0001-27, Army Ammunition Data Sheets, Small Arms, June 1981

Cartridge, Caliber .38, Ball



Historical notes: Commercially known as the .38 Smith & Wesson Special or .38 Colt Special, this handgun cartridge was developed by Smith & Wesson and introduced with their Military and Police Model revolver in 1902. It was originally a military cartridge designed to replace the .38 Long Colt then in use by the Army. It continues to be used by the military today, principally by criminal investigation agents using two-inch barreled revolvers.

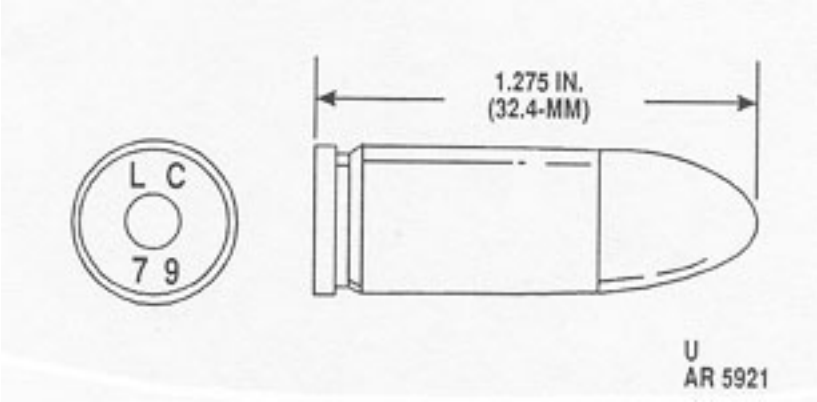
Components: The complete round, or cartridge, consists of a case, a primer, a propelling charge, and a bullet. The case is brass and the primer is a commercial type that contains a small charge of sensitive explosive. The primer is suitable for ignition of the smokeless powder used as a propelling charge. The weight of the bullet can be either 132-, 146-, 200-grains or more commonly, 158-grains, and is made of a lead/antimony alloy or a copper-coated, steel-jacketed lead bullet..

Length ..... 1.55 inch
Diameter (of bullet)..... .357 inch

References:

TM 9-1990, *Small Arms Ammunition*, 23 May 1942
TM 9-1990, *Small Arms Ammunition*, 15 September 1947
Primer, Pyrotechnic, and Incendiary Compositions for Small Arms Ammunition, Frankford Arsenal, October 1954
TM 9-1305-200, *Small Arms Ammunition*, 14 June 1961
Small Arms Ammunition Pamphlet, 23-1, Frankford Arsenal, August 1968
TM 43-0001-27, *Army Ammunition Data Sheets,* Small Arms, June 1981
U.S. Army Defense Ammunition Center and School, *Explosives and Propellants Reference Guide,* April 1994

Cartridge, Caliber .45, Ball, M1911



Historical notes: This cartridge was developed by John Browning in 1905 and adopted by the U.S. Ordnance Department, with the Colt-Browning automatic pistol, in 1911 (pistols M1911 and M1911A1 are often referred to as the "Colt .45 auto"). In addition to this pistol, the M1917 revolver could fire this cartridge, as well several submachine guns, such as the M3 "grease gun," M1 and M1928 Thompson submachine guns ("Tommy gun") and the Reising submachine gun. It is the most powerful pistol cartridge ever adopted by any military and was officially replaced in 1985 by the 9mm cartridge, but continues to be used by special units. Commercially, this is one of the most popular self defense and target shooting rounds and is known as the ".45 Automatic" or ".45 ACP" (automatic Colt pistol). From pistols, this cartridge has a velocity of 800-885 feet per second at 25 feet from the muzzle and a maximum range of 1,600 yards.

Components: The complete round, or cartridge, consists of a case, a primer, a propelling charge, and a bullet. The case is brass or steel and the primer contains a small charge of sensitive explosive. The primer is suitable for ignition of the smokeless powder used as a propelling charge. The weight of the military bullet is 230 grains (nominal), but commercially, there are 185-grain and 200-grain bullets. In addition to the military ball cartridge, there are blank, tracer, wadcutter and match rounds.

Length ..... 1.275 inches
Diameter (of bullet)..... .452 inches

References:

TR 1350-A, *Infantry and Aircraft Ammunition: Ammunition for Small Arms and Automatic Guns,* 18 May 1934
History of Modern U.S. Military Small Arms Ammunition, Vol. I 1880-1939, F.W. Hackley (undated)
TM 9-1990, *Small Arms Ammunition,* 23 May 1942
TM 9-1990, *Small Arms Ammunition,* 15 September 1947
Primer, Pyrotechnic, and Incendiary Compositions for Small Arms Ammunition, Frankford Arsenal, October 1954
TM 9-1305-200, *Small Arms Ammunition,* 14 June 1961
Small Arms Ammunition Pamphlet, 23-1, Frankford Arsenal, August 1968
TM 43-0001-27, *Army Ammunition Data Sheets,* Small Arms, June 1981

Cartridge, Caliber .50

TM 9–1300–200

Figure 3–9. Caliber .50 cartridges.

3–9

Historical Notes. The caliber .50 military cartridge (known commercially as the .50 BMG or Browning Machine Gun) was adopted by the U.S. Army in 1923 for the M2 heavy machine gun, and later for the M3 aircraft machine gun and the more recent M85 machine gun. It is still in service today. The original M1923 loading used an 803-grain bullet. It was found to be too heavy and by 1934 it was replaced with the M1 Ball cartridge that used a 753-grain bullet. By World War II, the M2 Ball cartridge was loaded with a 711-grain bullet (nominal). The current M33 Ball cartridge utilizes a 688-grain bullet.

General. In general, a small-arms cartridge is identified as an assembly of a cartridge case, primer, a quantity of propellant within the cartridge case, and a bullet or projectile. Blank cartridges are sealed with paper closure disks in lieu of bullets. Dummy cartridges are composed of a cartridge case and a bullet.

Case. The cartridge case for all U.S. caliber .50 rounds is made of brass, although some foreign-made cases are steel.

Propellant. Cartridges are loaded with varying weights of propellant. This is to impart sufficient velocity to the projectile to obtain the required ballistic performance. These propellants are usually of the single base (nitrocellulose) type. The propellant grain configuration may be cylindrical with a single, lengthwise perforation, spheroid (ball) or flake. Most propellants are coated with a deterrent (to assist in controlling the rate of combustion) and with a final coating of graphite (to facilitate flow of propellant and eliminate static electricity in loading cartridges). The IMR 4814 propellant is a single-base type originally produced by DuPont and known as improved military rifle powder. It is composed of nitrocellulose with traces of diphenylamine and potassium sulfate added.

Primer. Cartridges contain percussion primer. The percussion primer of brass or gliding metal cup that contains a pellet of sensitive explosive material secured by a paper disk and a brass anvil. Most primers loaded after 1950 were non-corrosive and contain lead styphnate.

Bullets.

Ball. The bullet consists of three parts: a gliding metal jacket, a soft steel core, and a point filler of antimony-lead alloy. The bullet is unpainted.

Tracer. The bullet is the similar to the M1 with the addition of a tracer and igniter composition. The tip is painted orange.

Blank. No bullet

Incendiary. The bullet consists of four parts: a gliding metal jacket, a hollow steel cylindrical core, an incendiary composition, and a lead base filler. The tip is painted light blue.

Armor-Piercing. The bullet consists of three parts: a gliding metal jacket, a tungsten-chrome steel core, and a point filler of lead hardened with antimony. The tip is painted black.

Armor-Piercing Incendiary. The bullet is similar to the armor-piercing bullet, except that the point filler is incendiary mixture instead of lead. The tip is painted aluminum.

Armor-Piercing Incendiary Tracer. The bullet consists of a hard steel core with compressed pyrotechnic mixture in the cavity in the base of the core, The core is covered by a gliding-metal jacket with incendiary mixture between the core point and jacket. The tip is painted aluminum and red

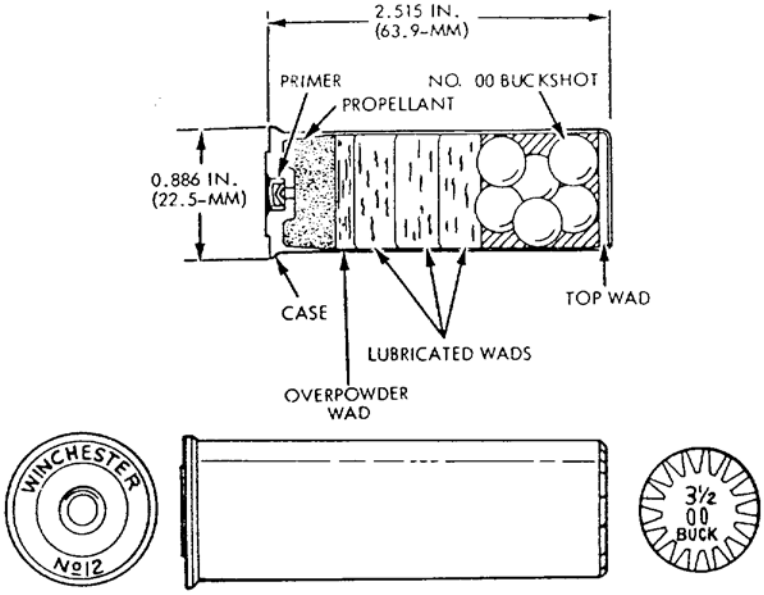
Dummy. The complete cartridge is inert. The cartridge case is tin-coated, has three holes drilled in the side and an empty primer pocket. The bullet may be tin-coated.

High Pressure Test. The cartridge case is distinguished from other cartridges by the tinned cartridge case. The bullet consists of a gliding metal jacket and a core made up of 2 slugs, a front and rear slug.

References:

Technical Regulation No. 1350-A, Infantry and Aircraft Ammunition: Ammunition for Small Arms and Automatic Guns, 18 May 1934
O.O. Form 7224, Ordnance Safety Manual, 1 December 1941
TM 9-1900, Small Arms Ammunition, 23 May 1942
History of Modern U.S. Military Small Arms Ammunition, Vol. I 1880-1939, F.W. Hackley (undated)
TM 9-1904, Ammunition Inspection Guide, 2 March 1944
Record of Army Ordnance Research and Development, Volume 2, Small Arms and Small Arms Ammunition, January 1946
TM 9-1990, Small Arms Ammunition, 15 September 1947
Primer, Pyrotechnic, and Incendiary Compositions for Small Arms Ammunition, Frankford Arsenal, October 1954
TM 9-1900, Ammunition General, June 1956
Small Arms Incendiary Ammunition, A Review of the History and Development, Volumes 1-4, Frankford Arsenal Report No R1407-1, DEC 56
Complete Round Charts, Book I, Small Arms Ammunition, 1 May 1959
TM 9-1305-200, Small Arms Ammunition, 14 June 1961
Small Arms Ammunition Pamphlet, 23-1, Frankford Arsenal, August 1968
TM 43-0001-27, Army Ammunition Data Sheets, Small Arms, 29 June 1981
TM 43-0001-27, Army Ammunition Data Sheets, Small Arms, 29 April 1994

Shell, Shotgun, 12 Gage



Historical notes: The U.S. military has a long history of using shotguns, dating back to the late 1800's and continuing today. Several different sizes (bore, gage or sometimes "gauge") of shotguns are in use, including .410 bore, 20 gage and 12 gage. The Remington Arms Company introduced plastic shell bodies in 1958.

General: Shotgun shells are procured by the Ordnance Department from several commercial manufacturers for use in sporting and riot-type shotguns. They are intended for guard or combat use and for trap and skeet shooting. Shells contain shot pellets in different sizes for various purposes. Numbers 7 ½ and 9 shot are typically used for sporting purposes (trap and skeet), while 00 buckshot is primarily used for combat.

Visual identification: Shells for guard and combat use have a brass head extending at least 1-inch along the case. Shells for sporting use have a head extending only 1/2 inch along the case. The shell body may be paper, plastic or brass.

Components: The shell consists of a case, a primer, several wads, a propelling charge, and a load of lead shot (or more recently, steel). The case consists of a brass head and a paper or plastic case or shell body (in some shells, the entire case is of brass or plastic.) In guard or combat shells, the head extends a distance of 1 inch along the case. In sporting shells, the head extends 1/2 inch or less. Some paper shells have steel reinforcement, called the lining, under the brass head. The primer is a commercial type suitable for ignition of the smokeless powder used as a propelling charge. The size of the lead shot for each type is as follows:

Guard or combat .....No. 00 buckshot
No. 4 chilled shot

Sporting.....No. 71/2 or 8 chilled shot (trap & skeet)
No. 9 chilled shot (skeet)

[Chilled shot is normally a harder, lead-antimony alloy]

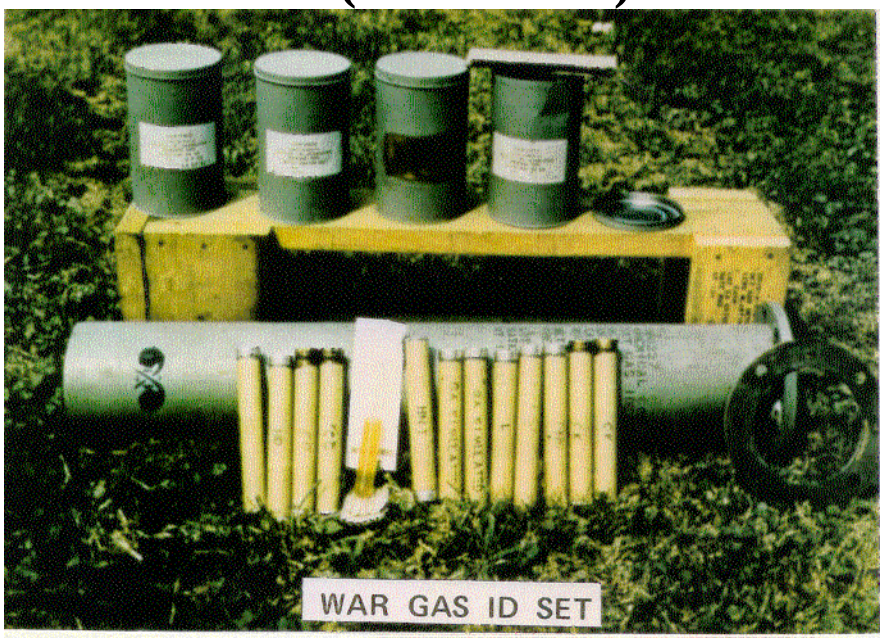
Dimensions for 12-gage shell:
Length ..... 2.515 inch (63.9mm)
Total Weight ..... 930 grains
Diameter (at head) ..... .886 inch (22.5mm)

References:

TM 9-1990, *Small Arms Ammunition*, 23 May 1942
TM 9-1990, *Small Arms Ammunition*, 15 September 1947
Primer, Pyrotechnic, and Incendiary Compositions for Small Arms Ammunition, Frankford Arsenal, October 1954
TM 9-1305-200, *Small Arms Ammunition*, 14 June 1961
Small Arms Ammunition Pamphlet, 23-1, Frankford Arsenal, August 1968
TM 43-0001-27, *Army Ammunition Data Sheets*, Small Arms, June 1981
U.S. Army Defense Ammunition Center and School, *Explosives and Propellants Reference Guide,* April 1994

PHYSICAL AND CHEMICAL CHARACTERISTICS DATA SHEETS

War Gas Identification Set, Instructional, M1 (K951/K952)



Use. Designed to be used outdoors. The gas tubes would be detonated, creating an agent cloud. Soldiers would then try to identify the agent based on its odor and other characteristics.

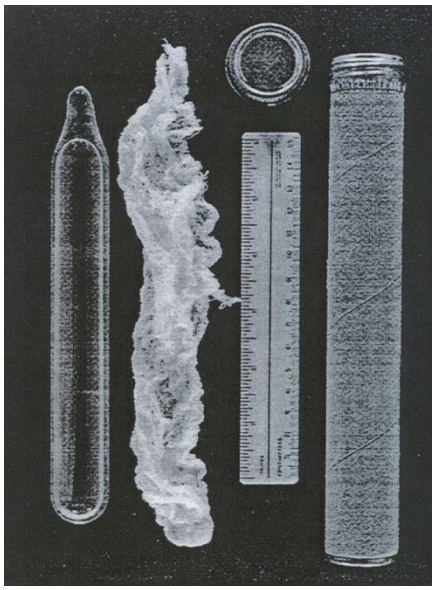
Description. The K951/952 Chemical Agent Identification Set (CAIS) contained 48 Pyrex, flame sealed ampules, 12 each containing 1.4 ounce solution of Mustard (H, 5% in chloroform) Lewisite (L, 5% in chloroform), Chloropicrin (PS, 50% in chloroform), and Phosgene (CG) for a total of 26 fluid ounces (0.768 liters) of agent, less the chloroform, per set. Each ampoule is 1 inch in diameter and 7-1/2 inches long. Each ampoule is packed in a cardboard screw cap container (mailing tube type) with agent type indicated by letters on the cardboard container. Twelve (12) cardboard containers each are packaged into 4 press fit metal cans, which are 9-1/4 inches high. The cans are packed into a steel cylinder 6-5/8 inches in diameter, approximately 38 inches long and 0.145 inches thick. A flanged end cover that is secured by eight bolts closes the open end of the cylinder. The only difference between the K951 and K952 is that the K951 was issued with blasting caps that were packed and shipped in a separate container.

The amount of agent and solvent in each ampoule is:

H – 2 ml agent; 38 ml Chloroform
L – 2 ml Agent; 28 ml Chloroform
PS – 20 ml Agent; 20 ml Chloroform
CG – 40 ml Agent; 0 ml Chloroform

The K951 ampoules (also called vials) are frequently found in burial sites at old WWII training areas. They are sometimes found loose, sometimes found in the original steel cylinders (also called “pigs”), and are sometimes found in drums, cans, or other disposal containers. When

found loose, the agent type cannot be readily identified without sophisticated spectrographic equipment, and a worst-case assumption of phosgene should be made by field personnel.



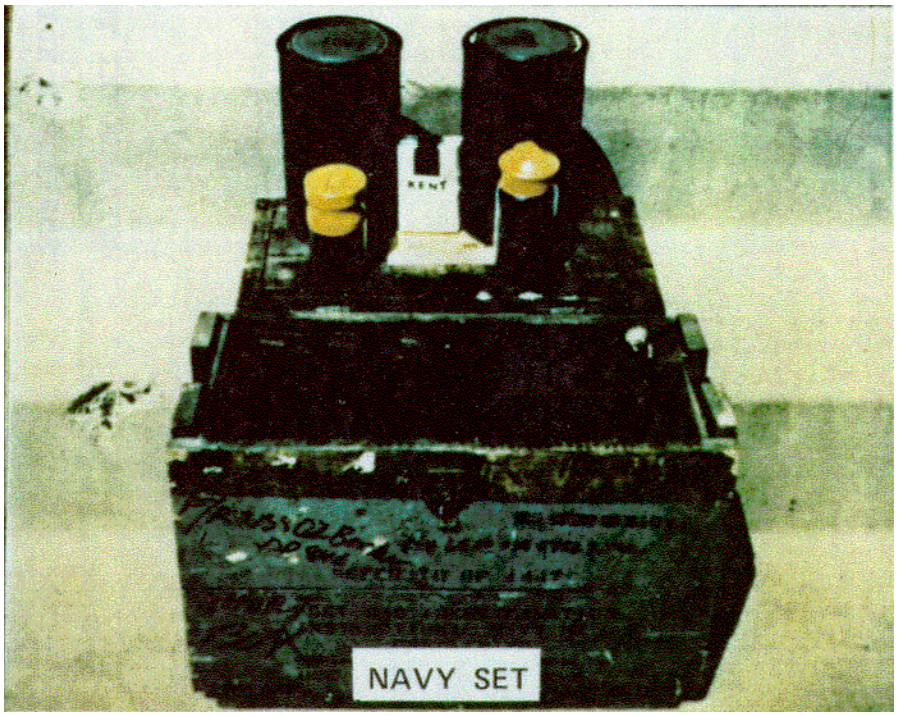
Time frame of use..... early 1930 to the late 1950s

Old Stock Number .....FSN 1365-025-3273 (K951)
FSN 1365-025-3783 (K952)

Reference:

Chemical Agent Identification Sets CAIS) formation Package, U.S. Army Program Manager for Chemical Demilitarization, November 1995.

Gas Identification Set, Instructional M1, (Navy Set), K955



Use. Designed to be used indoors to instruct military personnel in recognizing the odors of chemical agent. This type of set contains only a small amount of chemical agent.

Description. The K955 Chemical Agent Identification Set (CAIS) contains seven glass bottles with a total of 3.5 fluid ounces (0.103 liters) of agent per CAIS. Four of the bottles contain 3 ounces (90cc) of activated charcoal on which agent is absorbed. One bottle contains Lewisite (L), one Chloropicrin (PS), and two Mustard (HS), one contains 6 grams of Triphosgene (a simulant for Phosgene (CG), one 15 grams of Chloroacetophenone (CN), and one with 15 grams of Adamsite (DM). These sets are packed in a hinged-covered wood box that resembles a footlocker and measures 30□inches wide, 15□inches long and 11□inches high. The inside of the box is divided into eight sections. Seven of the sections contain sealed cans in sawdust and the eighth has instructions. The cans are 4 inches in diameter and 7 inches high and have paint can type lid. Inside each can is one round bottle with a large screw top or glass stopper, which is usually wax, coated. The bottles are frequently filled with charcoal.

Old Stock Number .....FSN 1365-368-6154

Time Frame of use: .....Late 1930's to World War II

Reference:

Chemical Agent Identification Set Information Package, date unknown, U.S.A. Chemical Material Destruction Agency, Aberdeen Proving Ground, Md.

CHEMICAL WARFARE AGENTS Reference and Training Chart

SYMBOL	NAME	CLASS	BANDS / COLOR	LOADING	ODOR	TACTICAL CLASS	PHYSIOLOGICAL EFFECT
HS	MUSTARD (DI-CLORDIETHYL SULFIDE)	Gas	2 Green		Garlic Horseradish Mustard		Burns skin or membrane
M-1	LEWISITE (CHLORVINYLDICHLORARSINE)	Gas	2 Green		Geraniums		Irritates nasal passages. Later skin burns, poison.
ED	ETHYLDI-CHLORARSINE	Gas	2 Green		Biting Stinging		Causes blisters, sores
PS	CHLORPICRIN (NITROCHLOROFORM)	Gas	2 Green	+ CG + CN	Flypaper Anise		Causes severe coughing, crying, lung edema
DP	DIPHOSGENE (TRICHLORMETHYL CHLOROFORMATE)	Gas	2 Green		Musty Hay Green Corn Ensilage		Causes coughing, breathing hurts, eyes water, toxic
CG	PHOSGENE (CARBONYL CHLORIDE)	Gas	1 Green		Musty Hay Green Corn Ensilage		Irritates lungs
CL	CHLORINE	Gas	1 Green	+ PS + CG	Highly Pungent		Intense immediate choking
*CN (CNS)	CHLORACETO-PHENONE	Gas (Solution)	1 Red (2 Red)		Apple blossoms		Makes eyes smart, shut tightly, tears flow. Temporary.
CA	BROMBENZYL-CYANIDE	Gas	2 Red		Sour fruit		Eyes smart, shut, tears flow. Effect lasts some time.
DM	ADAMSITE (DIPHENYLAMINE CHLORARSINE)	Gas	1 Red	(+CN)	Coal Smoke		Causes sneezing, sick depressed feeling
DA	DIPHENYL-CHLORARSINE	Gas	1 Red		Shoe Polish		Causes sneezing, sick depressed feeling
HC	HC MIXTURE	Smoke	1 Yellow		Sharp-acrid		Harmless
FS	SULPHUR TRIOXIDE (IN CHLORSULFONIC ACID)	Smoke	1 Yellow		Burning matches		Liquid burns skin if allowed to remain
FM	TITANIUM TETRACHLORIDE	Smoke	1 Yellow		Acrid		Harmless
WP	WHITE PHOSPHORUS	Smoke	1 Yellow		Burning matches		Burning pieces adhere to skin, clothing
†TH	THERMIT (THERMITE) (MAGNETIC IRON OXIDE AND ALUMINUM POWDER)	Incendiary	1 Purple		Odorless		5000 degree F. heat ignites materials

PROTECTION	FIRST AID	COLOR & STATE: LOADED	COLOR & STATE: RELEASED	PERSISTENCE	TACTICAL USES	FIELD NEUTRALIZATION
	Remove clothing. Wash affected parts of body with soapy water. Irrigate eyes with 2% sodium bicarbonate solution	HEAVY DARK, OILY LIQUID	Liquid slowly evaporates	Open - 1 day Woods - 1 week to all winter	To neutralize areas Counter-battery Attack on Personnel	Cover with bleaching powder and earth 3% Sol'n of Na_2S
	Apply 2 to 5% solution hydrogen peroxide to skin; wash with soap and water. Irrigate eyes with water or 2% sodium bicarbonate solution	HEAVY DARK, OILY LIQUID	Liquid slowly evaporates	Open - 1 day Woods - 1 week	Similar to Mustard	Wash down with water Cover with earth Alcohol. NaOH Spray
	Apply 2 to 5% solution hydrogen peroxide to skin; wash with soap and water. Irrigate eyes with water or 2% sodium bicarbonate solution	CLEAR OILY LIQUID	Evaporates at medium rate.	1 hour	Counter-battery Preparation fire Harassing fire	Cover with earth, Caustic, NaOH solution
	Wash eyes, keep quiet and warm Do not rub eyes	YELLOW OILY LIQUID	Evaporates like water.	Open 6 hours Woods - 12 hours	Harassing and casualty fire	Na_2SO_3-Sodium Sulfite in alcohol solution
	Keep quiet and warm Give coffee as a stimulant	COLORLESS LIQUID	Evaporates like water.	30 minutes	Harassing and casualty fire	Alkali
	Keep quiet and warm Give coffee as a stimulant	COLORLESS LIQUID	Colorless gas	10 to 30 minutes	Surprise attacks, projectiles Gas cloud release For quick physical effect	Alkali
	Keep quiet and warm Coffee as stimulant	YELLOW LIQUID	Yellow-green gas	10 minutes	Surprise attacks (cloud)	Alkaline Solution
	Wash eyes with water or boric acid. Do not rub or bandage. Wash skin with 4% Na_2SO_3 in 50% Alcohol Solution	WHITE CRYSTALLINE POWDER	Cloud of small, solid particles	10 minutes	Training Mob control CNS used in counter-battery to force mask wear	Strong, hot solution of Sodium Carbonate
	Wash eyes with boric acid Do not bandage	DARK BROWN OILY LIQUID	Slowly evaporates	Several days (weeks in winter)	To neutralize areas Counter-battery	Alcoholic Sodium hydroxide spray
	Remove to pure air and keep quiet. Breathe small amounts of chlorine	YELLOW-GREEN GRANULAR SOLID	Yellow smoke	10 minutes	Gas Cloud Attacks Mob control -	Bleaching Powder Solution
	Remove to pure air, keep quiet Sniff chlorine from bleaching powder bottle	WHITE CRYSTALLINE SOLID	Vapor or fine smoke	Summer 10 minutes	Harassing fire	Bleaching Powder Solution
NONE NEEDED	Produces no effect requiring treatment	GREY SOLID	White to grey smoke	While burning	To screen small operations in own lines and for training purposes	None needed
	Wash with Soda solution	CLEAR TO BROWN LIQUID	Dense white smoke	5 - 10 minutes	Airplane spray for screen on broad front -	Alkaline Solution
NONE NEEDED	Produces no effect requiring treatment	YELLOWISH TO BROWN LIQUID	White smoke	10 minutes	Screening operations	None needed
NONE AVAILABLE	Wash with Copper Sulphate solution or immerse in water	PALE YELLOW SOLID	Burns to white smoke in air	10 minutes	To screen advancing troops Cause incendiary effects, losses Harass enemy observers -	Burns out
COVER WITH EARTH, SAND	Treat for burn	METALLIC POWDER	White-hot metal	5 minutes	Destruction of Materiel -	Quickly cover with earth or sand

CHEMICAL CYLINDER Holds 32 lbs. | ARTILLERY SHELL, 155— Holds 11.1 lbs. | ARTILLERY SHELL, 75— Holds 1.3 lbs. | MORTAR SHELL, 4.2 in. Holds 5.0 lbs. | LIVENS PROJECTOR SHELL Holds 28 lbs. | AERIAL BOMB May Vary In Size | GRENADE | CANDLE | AIRPLANE SPRAY

HOSPITAL CASUALTY AGENT | FIELD CASUALTY AGENT | SMOKE SCREEN | INCENDIARY AGENT | GAS MASK | GASPROOF CLOTHING

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APPENDIX G

TEXTUAL REFERENCES

ELECTRONIC COPY ONLY

Due to the volume of textual references of source documents gathered and cited for this PA effort, it was determined not to include a printout of them as an appendix.

The endnotes included as Appendix B are digital scans of the cited textual references and are provided as part of the digital version of this report.
*The gathered textual document scans are in Adobe *.PDF format.*

APPENDIX H

STILL PHOTOGRAPH REFERENCES

ELECTRONIC COPY ONLY

*Selected historic still photographs are included as figures in the main text of this report. Additional historic imagery is included within the digital version of this report. The gathered photograph scans are in Adobe *.pdf format.*

APPENDIX I

MAPS/DRAWINGS REFERENCES

ELECTRONIC COPY ONLY

Due to the volume of maps and drawings references gathered and cited for this APA effort, it was determined not to include a printout of them as an appendix.

Digital scans of the maps and drawings references are provided as part of the digital version of this report. The gathered maps and drawings scans are in .JPG or .TIF format.

APPENDIX J

INTERVIEWS

NOT APPLICABLE

Interviews were not conducted or necessary for the completion of this report. Information from interviews conducted during previous investigations was reviewed.

APPENDIX K

ABBREVIATED SITE SAFETY AND HEALTH PLAN (ASSHP)

ABBREVIATED SITE-SPECIFIC SAFETY AND HEALTH PLAN (ASSHP)
FOR

Site Name:	**Floyd Bennett Field**
Site Location:	Brooklyn (Jamaica Bay), NY
Purpose of Visit:	The purpose of this site visit is to reconnoiter, document and photograph areas of the former Floyd Bennett Field in Brooklyn (Jamaica Bay), NY potentially contaminated with munitions and explosives of concern (MEC) and/or Hazardous Toxic Radioactive Waste (HTRW). Information collected will be utilized to prepare an Abbreviated Preliminary Assessment (APA) for the subject property.
Dates of site visit:	04 November 2014
ASSHP prepared by:	Shelia DeVeydt, Military History Specialist

Office:	USACE – St. Louis District (CEMVS-EC-E)
Address:	1222 Spruce Street, St. Louis, MO 63103-2833
Telephone:	314-331-8793

Date Prepared: 03 November 2014

SIGNATURE: Shelia DeVeydt DATE: 11/04/2014

ASSHP REVIEWED/APPROVED BY
(USACE Command designated approval authority):

William James
Signature/Title:

11/04/2014
DATE

NOTE: This ASSHP is to be used only for non-intrusive site visits and it must be approved prior to the start of the field visit. All team members must read and comply with the ASSHP, and attend the safety briefings.

I. SITE DESCRIPTION AND PREVIOUS INVESTIGATIONS

(Attach a site map to this ASSHP)

A. SITE DESCRIPTION

- **Size:** Approximately 1,300 acres

- **Present usage** (Check all that apply)

☒ Military	☒ Recreational	☒ Agricultural
☐ Residential	☒ Commercial	☐ Landfill
☐ Natural Area	☐ Industrial	
☒ Other Specify: Part of the Gateway National Recreation Area		

☐ Secured	☐ Active	☐ Unknown
☒ Unsecured	☐ Inactive	

B. PAST USES: The Department of Defense (DoD) used the former Floyd Bennett Field from 1931 to 1967. Subsequent to DoD ownership, the property has been used as the location for the Gateway National Recreation Area operated by the National Park Service. Other areas of the former airfield are used by the New York State Police Department, a Marine Corps Reserve facility, a community garden, and some private businesses.

C. SURROUNDING POPULATION:

☐ Rural	☐ Residential	☐ Commercial
☐ Urban	☐ Industrial	
☒ Other specify: National Recreation Area		

D. PREVIOUS SAMPLING/INVESTIGATION RESULTS:

(1) MEC ENCOUNTERED: N/A

(2) HTRW ENCOUNTERED: N/A

(3) SAMPLES: N/A

II. DESCRIPTION OF ON-SITE ACTIVITIES:

☒ Walk-through	☒ Drive-through	☐ Fly over
☒ On road	☐ Off road	☒ On path
☒ Off path		
☐ Other Specify		

Activities/Tasks to be Performed (Summarize):

The team plans on performing a visual, non-intrusive inspection of the areas suspected of having an MEC hazard potential, taking GPS waypoints and pictures of items of interest. The traverse will include walked and driven portions.

III. SITE PERSONNEL AND RESPONSIBILITIES:

A. USACE PROJECT MANAGER:

NAME:	Randal S. Curtis, P.E.
OFFICE:	U.S. Army Corps of Engineers – St. Louis District (CEMVS-EC-EP)
ADDRESS:	1222 Spruce Street, St. Louis, MO 63103-2833
PHONE:	314-331- 8786

RESPONSIBILITIES

The ASSHP Project Manager (PM) is overall responsible Corps of Engineers employee responsible for conducting the APA. He will assign a Team Leader, (in most situations this will be the PM). The PM will ensure that the ASSHP is completed along with coordinating and executing the site visit.

B. TEAM LEADER:

NAME:	Shelia DeVeydt
OFFICE:	U.S. Army Corps of Engineers – St. Louis District (CEMVS-EC-E)
ADDRESS:	1222 Spruce Street, St. Louis, MO 63103-2833
PHONE:	314-331-8793

RESPONSIBILITIES

The ASSHP team leader coordinates the site visit and is the lead author of this APA.

C. UXOSO/OE SAFETY SPECIALIST:

NAME:	William Kirk James
OFFICE:	U.S. Army Corps of Engineers – St. Louis District (CEMVS-EC-E)
ADDRESS:	1222 Spruce Street, St. Louis, MO 63103-2833
PHONE:	318-306-0294

RESPONSIBILITIES

Brief this ASSHP to ensure the ASSHP guidelines are followed (if applicable).

D. FIRST AID/CPR CERTIFIED:

NAME:	Shelia DeVeydt
OFFICE:	U.S. Army Corps of Engineers – St. Louis District (CEMVS-EC-E)
ADDRESS:	1222 Spruce Street, St. Louis, MO 63103-2833
PHONE:	314-331-8793

RESPONSIBILITIES

Administer First Aid in the event of an emergency.

E. TEAM MEMBERS: (other than those listed above)

NAME:	
OFFICE:	
ADDRESS:	
PHONE:	

RESPONSIBILITIES

The non-CEMVS-EC-E ASSHP team members were invited to witness and participate in the site visit.

IV. HAZARD ANALYSIS:

A. Safety and health hazards anticipated:

☐ Chemical
☐ Ordnance (specify):

☒ Heat Stress	☐ Cold Stress	☒ Foot Hazard	☒ Slip/Trip/Fall
☐ Confined Space	☐ Climbing	☐ Overhead	☐ Falling Objects
☐ Noise	☐ Water	☐ Electrical	☒ Biological
☐ Explosive	☐ Flammable	☐ Radiological	☐ Other:

B. Overall Hazard Evaluation:

☐ High	☐ Moderate	☒ Low	☐ Unknown

JUSTIFICATION: Small arms is the only suspected munition used on the property, and there is no known MC contamination on the property.

This assessment was developed using the Site Investigation Hazard Analysis and Risk Assessment Code.

V. ACCIDENT PREVENTION:

A. GENERAL PRECAUTIONS:

Prior to the on-site visit, all team members are required to read this ASSHP and sign the form acknowledging that they have read and will comply with it. In addition, the PM will hold a brief tailgate meeting in which site specific topics regarding the day's activities will be discussed. The buddy system will be enforced at all times. If unanticipated hazardous conditions arise, team members are to stop work, evacuate the area and notify the appropriate authority.

VI. STANDARD OPERATION SAFETY PROCEDURES, ENGINEERING CONTROLS AND WORK PRACTICES

A. SITE RULES/PROHIBITIONS: At any sign of hazardous conditions, stop tasks, evacuate area and notify appropriate authority. Smoking, eating and drinking allowed in designated areas only.

B. MATERIAL HANDLING PROCEDURES: Do not handle.

C. DRUM HANDLING PROCEDURES: Do not handle.

D. CONFINED SPACE ENTRY: Do not enter.

E. IGNITION SOURCE / ELECTRICAL PROTECTION: Do not smoke.

F. SPILL CONTAINMENT: N/A

G. EXCAVATION SAFETY: Do not enter trenches/excavations.

H. ILLUMINATION: Work during daylight hours only.

I. SANITATION: Use existing sanitary facilities.

J. BUDDY SYSTEM: Two persons on-site maintaining constant contact with each other. To be adhered to at all times.

K. ENGINEERING CONTROLS: N/A

L. HEAT/COLD STRESS: Dress appropriately. Take sufficient breaks and drink plenty of fluids. Watch for signs/symptoms of cold/heat stress. Monitoring may be applicable depending on the site weather conditions and type of personal protection equipment (PPE) worn.

M. ORDNANCE

(1) The cardinal principle to be observed involving explosives, ammunition, severe fire hazards or toxic materials is to limit the exposure to a minimum of personnel, for the minimum amount of time, to a minimum amount of hazardous material consistent with a safe and efficient operation.

(2) Old, damaged, and possibly deteriorated explosive-loaded ordnance requires extreme caution. Some explosives may react with metals, other explosives, air, or chemicals in the earth to produce extremely sensitive explosive compounds.

(3) When chemical agents may be present, further precautions are necessary. If the munition has green markings leave the area immediately, since it may contain a chemical filler.

(4) Consider ordnance that has been exposed to fire as extremely hazardous. Chemical and physical changes may have occurred to the contents, which render it more sensitive than it was in its original state.

N. HTRW:

(1) On-site personnel shall have obtained the appropriate level of safety training (i.e. OSHA HAZWOPER).

(2) ALWAYS wear the appropriate PPE.

(3) Accomplished site activities in accordance with applicable requirements of Federal, state and local regulations, including site safety and health requirements of 29 CFR 1910.120.

O. POISONOUS SNAKES OR INSECTS:

(1) DO NOT handle any snake, even those that appear to be dead.

(2) Avoid areas of limited visibility such as tall grass or heavy vegetation.

(3) Roll sleeves down and use insect repellant.

P. POISONOUS PLANTS:

(1) Avoid areas of limited visibility such as tall grass or heavy vegetation.

(2) Roll sleeves down and use barrier cream and wear gloves.

Q. OTHER: None

VII. SITE CONTROL AND COMMUNICATIONS:

A. SITE MAP: See Attached.

B. SITE WORK ZONES: N/A (contamination contact not anticipated)

C. BUDDY SYSTEM: To be adhered to at all times.

D. COMMUNICATIONS:

(1) ON-SITE: Verbal communications will be used among team members to communicate to each other on-site. If this communication is not possible, the following hand signals will be used.

GRIP PARTNER'S WRIST OR BOTH HANDS AROUND WAIST
Leave the area immediately.

HAND GRIPPING NOSE – Unusual smell detected

THUMBS UP – OK, I am alright or I understand

THUMBS DOWN – No, negative

(2) OFF-SITE: Off-site communications will be established on every site. Communications may be established by using an on-site cellular phone or by locating the nearest public phone or private phone which may be readily accessed.

☒ Cellular Phone

☐ Public/Private phone

☐ Other

(3) EMERGENCY SIGNALS: In the case of small groups, a verbal signal for emergencies shall suffice. The emergency signal for large groups should be incorporated at the discretion of the appropriate authority.

☒ Verbal

☐ Nonverbal (Specify)

VIII. EMERGENCY RESPONSE:

A. Team members are to be alert to the dangers associated with the site at all times. If a hazardous condition arises, stop work, evacuate the immediate area and notify the appropriate authority.

B. FIRST AID: A first aid kit and emergency eye wash (as applicable) will be located in PM's field car. If qualified persons (i.e. a fire department, medical facility or physician) is not accessible within five minutes of the site, at least one member will be qualified to administer first aid and CPR.

C. EMERGENCY TELEPHONE NUMBERS:

1. MEDICAL FACILITY:	911
2. FIRE DEPARTMENT	911
3. POLICE DEPARTMENT	911
4. POISON CONTROL CENTER:	800-222-1222
5. USAESCH OE SAFETY OFFICE	256-895-1598
6. TEU:	401-671-2773
7. PROJECT MANAGER:	314-331-88786
8. CELL PHONES:	Shelia DeVeydt: (314) 223-8123 William James: (318) 306-0294

D. DIRECTIONS TO THE NEAREST HOSPITAL/MEDICAL FACILITY:

New York Community Hospital
2525 Kings Highway
Brooklyn, NY 11229
718-692-5300

(See attached maps at end of ASSHP for directions)

IX. MONITORING EQUIPMENT AND PROCEDURES:

A. EXPOSURE MONITORING: For non-intrusive on-site activities such as site visits, air monitoring is normally not required. However, if the site situation dictates the need for monitoring, complete the following information on a separate page and attach the page to the ASSHP.

- Monitoring equipment to be used.

- Documentation of equipment calibration and results.

- Action Levels.

B. HEAT/COLD STRESS MONITORING: Include an enclosure with the condition to be monitored and the procedures. If heat stress monitoring is necessary, the monitoring criteria published in Chapter 8 of the NIOSH/OSHA/USCG/EPA "Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities" (Oct '85) will be followed. If cold stress monitoring is necessary, it will be conducted IAW the most current published American Conference of Governmental Industrial Hygienist (ACGIH) cold stress standards.

X. PERSONAL PROTECTIVE EQUIPMENT:

A. GENERAL:

Typically, for non-intrusive site visits, Level D is required. Team members should avoid wearing outer or undergarments made of wool, silk or synthetic textiles such as rayon or nylon. These materials can generate sufficient static charge to ignite explosives. Hard hats will be worn if an overhead hazard exists, safety glasses if an eye hazard is present, and safety shoes will be worn if a foot hazard exists.

B. NON-INTRUSIVE SITE VISIT:

Level of Protection: Level D ☒ Modified (specify)

Short or long-sleeved shirt, long pants, boots

Contingency: Evacuate site if higher level of protection is needed.

XI. DECONTAMINATION PROCEDURES:

Decontamination procedures are not anticipated for this site investigation. Team members are cautioned not to walk, kneel or sit on any surface with potential leaks, spills or contamination.

XII. TRAINING:

All site personnel will have completed the training required by EM 385-1-1 and CFR 29 1910.120 (e). The USACE Project Manager will ensure that all on-site personnel have completed the appropriate training prior to the property visit. Additionally, the PM will inform personnel before entering, of any potential site-specific hazards and procedures.

XIII. LOGS, REPORTS AND RECORD KEEPING:

Site logs are maintained by the Project Manager. This is to include historical data, personnel authorized to visit the site, all records, standard operating procedures and the ASSHP submitted. Any air monitoring logs, SOPs, and attachments to plans.

IX. GENERAL:

The number of persons visiting the site will be held to a minimum. No more than 8 persons will be allowed on site. The more persons on-site, the greater potential for an accident. The PM may modify this ASSHP, if site conditions warrant it, and without risking the safety and health of the team members. This modification will be coordinated with the team members and the PM will notify the approving authority of the change as the situation allows.

SITE BRIEFING CHECKLIST

SITE NAME: Floyd Bennett Field	DATE/TIME: 04 November 2014/0900

GENERAL INFORMATION

- ☐ PURPOSE OF VISIT
- ☐ IDENTIFY KEY SITE PERSONNEL
- ☐ TRAINING AND MEDICAL REQUIREMENTS

SITE SPECIFIC INFORMATION

- ☐ Site description/past use
- ☐ Results of previous studies
- ☐ Potential site hazards
- ☐ MEC/HTRW safety procedures
- ☐ Site SOP
- ☐ Site control and communications
- ☐ Emergency hand signals
- ☐ Emergency response
    - ☐ Location of first aid kit
    - ☐ Emergency phone numbers & location
    - ☐ Location of nearest medical facility and location of map to facility
- ☐ PPE

Stress the following during the briefing: ***If hazardous conditions arise, stop work, evaluate the area and notify the appropriate authority.***

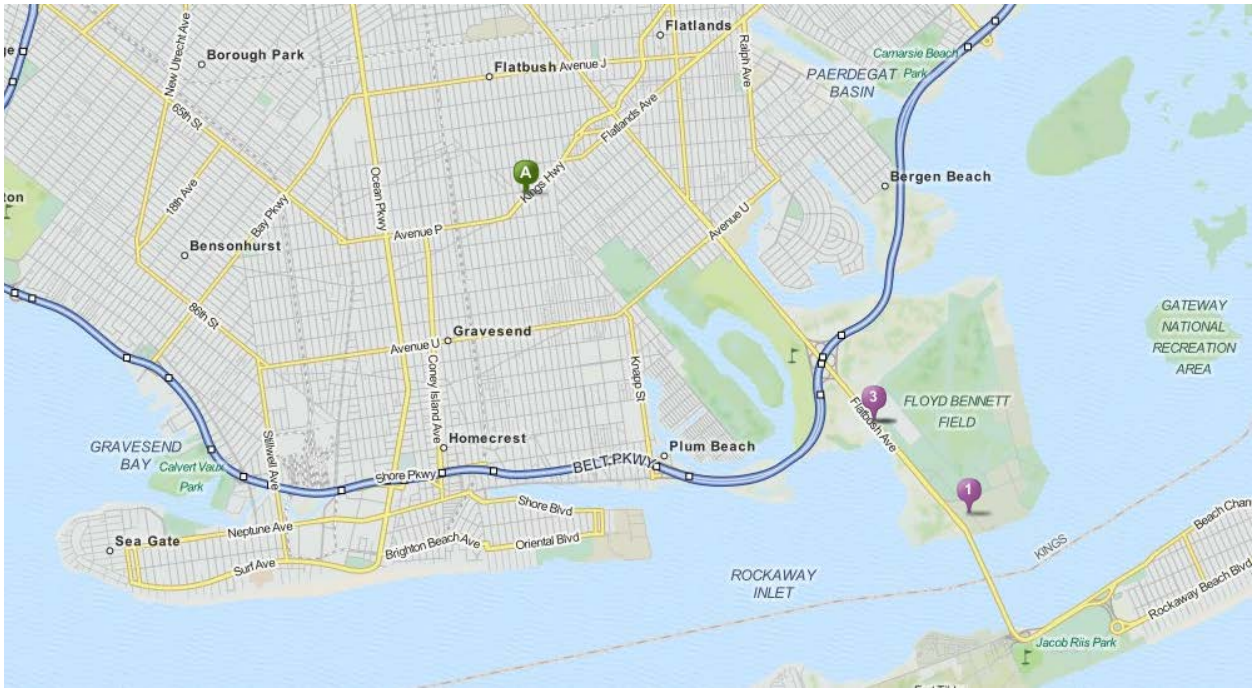
PLAN ACCEPTANCE FORM

ABBREVIATED SAFETY AND HEALTH PLAN
FOR
FLOYD BENNETT FIELD
BROOKLYN (JAMAICA BAY), NY

Name (Printed)	Office	Signature	Date
William James	EC-E	William James	11/4/14
Shelia DeVeydt	EC-E	Shelia DeVeydt	11/4/14

PROPERTY SITE MAP

HOSPITAL ROUTE MAP



New York Community Hospital
2525 Kings Highway
Brooklyn, NY 11229
718-692-5300

APPENDIX L

PROPERTY VISIT REPORT

CEMVS-EC-E 10 November 2014

MEMORANDUM FOR RECORD

SUBJECT: APA Visual Property Inspection: Floyd Bennett Field – Brooklyn (Jamaica Bay), New York

1. Personnel from the St. Louis District Corps of Engineers Traveled to Brooklyn, New York on 2 November 2014 to perform a property survey of the former Floyd Bennett Field FUDS property (C02NY0020) between 3 and 4 November 2014. The Abbreviated Preliminary Assessment (APA) program requires a visual property inspection. The APA program supports the Defense Environmental Restoration Program (DERP) at Formerly Used Defense Sites (FUDS).

2. The APA site visit characterized the potential for munitions and explosives of concern (MEC) based on a visual examination at the former Floyd Bennett Field. This potential is based on an analysis of the collected information. Prior to the inspection, the APA investigation team determined the areas of the site to investigate. The APA investigation team consisted of the following personnel: Shelia DeVeydt and William James of the St. Louis District of the U.S. Army Corps of Engineers (USACE).

The site survey team met with Kathleen Cuzzolino, Environmental Protection Specialist with the NPS (718-354-4609) and Sandra Piettro, FUDs Project Manager for the New York District of the USACE (917-790-8487). The team explained the site visit mission and route where the team intended to walk to observe current conditions. Kathleen Cuzzolino was not aware of any type of munitions or debris being found in the past.

The team followed an abbreviated site safety and health plan defining standard operating procedures to ensure safety and prevent accidents (see Appendix K). The team began by reviewing and signing the site safety health plan (SSHP) prior to commencing the site visit. The property inspection included only visual and non-intrusive methods of inspection.

3. The site is currently owned and operated by the National Park Service (NPS) and is one of the many properties making up the Gateway National Recreation Area in New York and New Jersey. Most of the property is open to the public with easy access to beach areas and walking trails in and around former magazine and small arms range areas. Although there are walking trails, any venture off the main trail is nearly impossible due to the extremely dense vegetation. The Marine Corps operates a small Reserve Center in the southern area of the former field. The New York City Police Department Aviation Unit operates a heliport landing area with a few support buildings. There are a few businesses (i.e. trash truck business) using portions of the property.

Figure 1 *– GPS Track Lines 3-4 November 2014*

The preceding figure gives an overall view of Floyd Bennett Field and shows track lines where the site survey team walked during the site inspection. The following paragraphs describe their observations in detail.

Feature 1 – Skeet Range Area (Shotgun Range House, Skeet and Trap Shooting Houses)

The site visit team visited the area near Building 105, the Shotgun Range House, and trap and skeet shooting houses. No evidence of the buildings remains and no other range related features were observed in the vicinity. Asphalt from the North Runway expansion covers a portion of the area. Bricks, concrete pieces, and other trash were observed on beach but no munitions debris (MD). This area is open to the public for recreational purposes.

Photo 1 *– Looking northwest towards former Building 105 and the skeet range*

***Photo 2** – Looking south down north runway now being used by model airplane enthusiasts. This area is adjacent to the former skeet ranges and Building 105*

***Photo 3** – Looking west near former skeet and trap range area*

Feature 2 - Building 106 (Inert Storage)

Building 106 Inert Storage is accessible by the public from the beach and from the walking trails. The building is in disrepair, the windows have been broken out, and it has become a graffiti artist's canvas. The site survey team did not enter the building. They found no MD, MEC, or DMM near the building.

Photo 4 *– Looking north at Building 106 Inert Storage*

***Photo 5** – East side of Building 106*

***Photo 6** – North side of Building 106, facing the beach*

***Photo 7** – West side of Building 106*

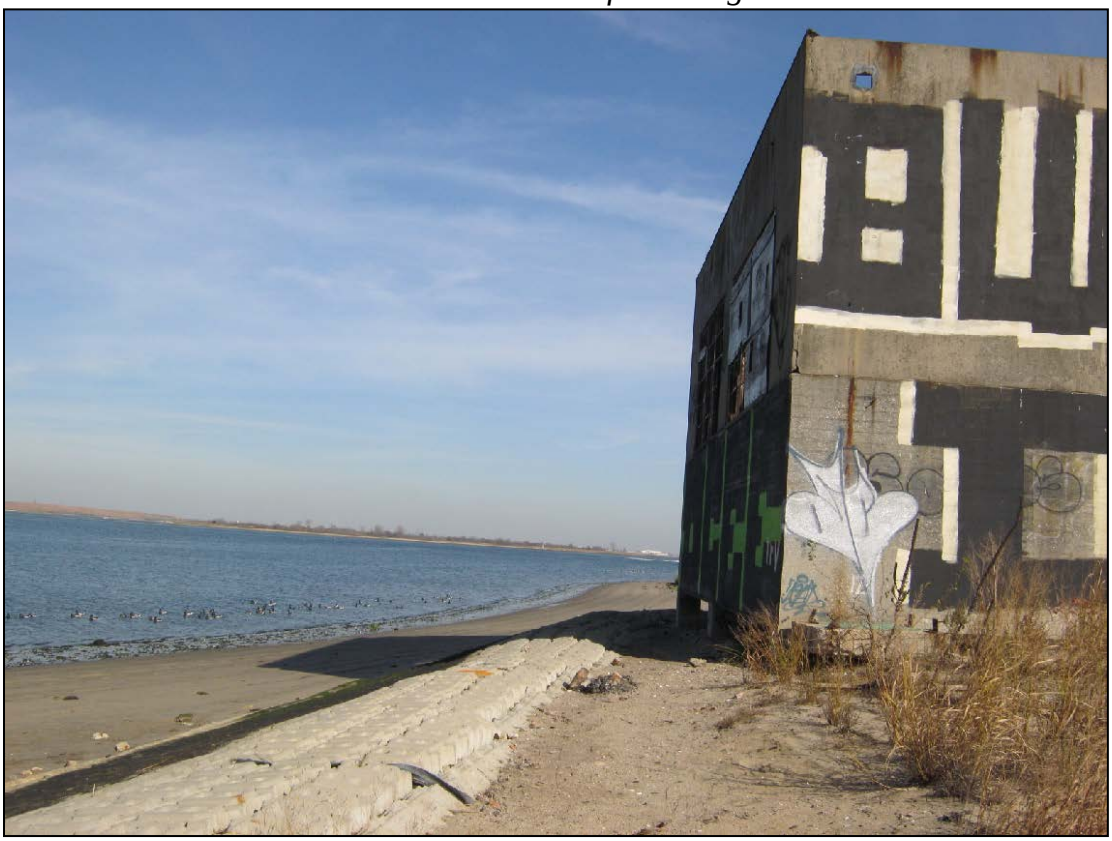


***Photo 8** – Looking east from Building 106*

***Photo 9** – Looking east from beach at Building 106*

Feature 3 - Building 107 (Smoke Drum Storage)

Building 107 Smoke Drum Building has been demolished and at present, after years of beach erosion, would be situated in the water. The site survey team observed no MD, MEC, or DMM.

Photo 10 *– Looking north at approximate location of Building 107*

***Photo 11** – Looking west at approximate location of Building 107*

Feature 5 - Building 109 (Practice Bomb Storage)

The site survey team observed Building 109 Practice Bomb Storage. It is located approximately 150 feet off of the overgrown trail. The tin building appears to be intact but age is showing. The site survey team observed no MD, MEC, or DMM.

Photo 12 *– Building 109 Practice Bomb Storage*

***Photo 13** – Building 109 Practice Bomb Storage showing dense vegetation*

Feature 6 - Building 110 (Fuze and Detonators), Feature 7 - Building 111 (Fuze and Detonators), Feature 8 - Building 112 (H.E. Magazine), and Feature 9 - Building 113 (H.E. Magazine)

The site survey team could not get close to the actual locations of the feature due to extremely dense vegetation. They walked as close to the features as possible; however, safety issues prevented them from identifying the buildings or specific areas. In order to get the exact location heavy equipment such as a brush hog would be needed to clear a path.

Feature 10 - Building 114 (H.E. Magazine)

The site survey team got as close to feature 10 as allowable for safety. Dense growth is typical throughout the area known as the "North Forty," or the northernmost undeveloped area of the field.

Photo 14 *– Building 114 HE Magazine general area overview*

Feature 11 - Building 115 (H.E. Magazine)

The site survey team observed a pesticide treated area near Building 115 HE Magazine. Even with this treatment trying to get to actual location would be difficult.

Photo 15 *– Pesticide application area*

***Photo 16** – Dense vegetation near Building 115 HE Magazine*

***Photo 17** – Dense vegetation near Building 115 HE magazine*

Feature 13 - Building 41 (Ammunition Storage)

Building 41 has been razed and concrete covers the entire area.

Photo 18 *– Looking southeast near the area of Building 41 Ammo Storage*

Photo 19 *– View looking southeast near former Building 41 at pile of trash and building debris*

***Photo 20** – Looking at a pile of debris near former Building 41 area*

***Photo 21** – Concrete storage structure west of or behind Building 41 Ammo Locker*

Feature 14 - Building 42 (Ready Ammunition Locker) and Feature 15 - Building 43 (Ready Ammunition Locker)

The team visited the area adjacent to the former Buildings 42 and 43 Ready Ammunition Locker. This fenced in area is now being used by the sanitation department for parking of vehicles and equipment. From a distance the area appears to be completely paved over and did not have structures resembling ammunition lockers.

Photo 22 *– Looking east at the former Buildings 42 and 43 Ready Ammunition Locker area*

Feature 16 - Building 44 (Ready Ammunition Locker)

The team visited the area (south of the Ryan Visitor Center) where Building 44 Ready Ammunition Locker once was located. The structure no longer exists and is an open field next to a hangar building.

Photo 23 *– View of area near Building 44 looking southwest*

***Photo 24** – Looking southwest at area near former Building 44*

***Photo 25** – Looking east at area near Building 44 Ammunition Locker*

***Photo 26** – Looking north at possible foundation outline for Building 44*

***Photo 27** – Looking north at Ryan Visitor Center from possible location of Building 44*

Feature 17 - Building 45 (Ready Ammunition Locker)

The area where Building 45 Ready Ammunition Locker was located is now a paved parking lot, north of the Ryan Visitor Center and adjacent to the athletic fields. The building is no longer present.

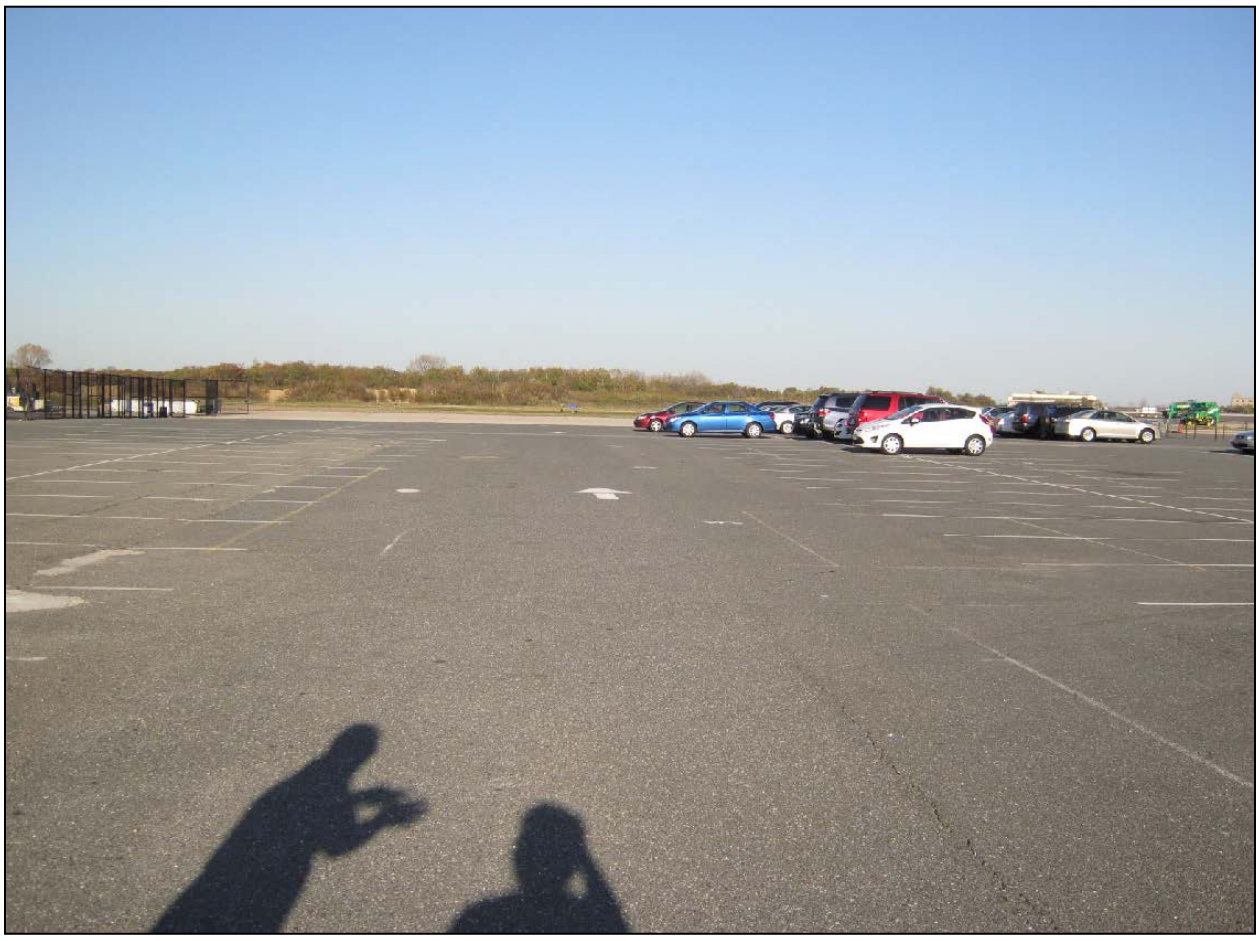


Photo 28 *– View looking northeast from area near former Building 45*

Photo 29 *– Looking South toward Building 8 Floyd Bennett Field Hangar in the vicinity of Building 45 Ready Ammunition Locker*

***Photo 30** – Another view of the area near Building 45*

Feature 18 - Building 93 (Ordnance Shop)

The team visited the area where Building 93 once was located. It no longer exists and only an empty field remains. There is some vegetation and trash but nothing of interest to this investigation was observed.

***Photo 31** – Looking south at area near former Building 93 Ordnance Shop*

Feature 19 – 1940s era Pistol Range

The 1940s era pistol range is located east of Building 105 and the skeet and trap range houses. The site survey team did not observe any remaining evidence of the pistol range. The area is characterized by extremely dense growth of brush and vegetation preventing clear ground views. Part of the area is a marshy wetland and visibility is severely limited off the trail.

Photo 32 *– Looking east from pistol range area*

***Photo 33** – Marshy area east of the pistol range*

***Photo 34** – Marsh adjacent to pistol range area*

Feature 20 – 1940s era Pistol Range Backstop

The site survey team did not see any remaining evidence of the pistol range or the backstop. Dense vegetation prohibited adequate viewing of the ground.

Photo 35 *– Vegetation east of the former pistol range*

***Photo 36** – Vegetation east of the former pistol range*

Features 21, 22, and 23 - 1950s era Pistol Range and Skeet Range

The site survey team did not see any remaining evidence of the pistol range or skeet range. Dense vegetation prohibited adequate viewing of the ground over much of the area. Some concrete and metal debris was observed but no MD, MEC, DMM, or any other range related features were found.

Photo 37 *– Overgrown area near 1950s era pistol range/skeet range area, looking east*

***Photo 38** – Dense vegetation near pistol range on northeastern side of Floyd Bennett Field*

***Photo 39** – Dense vegetation near 1950s pistol range*

Photo 40 *– Concrete debris near pistol / skeet range area on eastern edge of Floyd Bennett*

Photo 41 *– Close-up view of concrete debris located near pistol / skeet range on eastern edge of field*

Photo 42 *– Metal piping in area near 1950s pistol / skeet range area*

***Photo 43** – View of small building located south of pistol / skeet range area*

Photo 44 *– One of two small buildings located south of the pistol/skeet range on the eastern side of Floyd Bennett*

Photo 45 *– Looking east from small brick buildings, south of the pistol / skeet range area*

Feature 24 - Antiaircraft Artillery Gun Emplacements)

The following photos depict conditions of the vicinity of former antiaircraft artillery gun emplacements. The area is located on property currently owned by the U.S. Marine Corps for use as a recruit training center. Based on current DoD ownership of the site, it is not eligible for action under the FUDS program.

Photo 46 *– View of area near former AAA Battery*

***Photo 47** – Looking northwest into active Marine Corps property at former AAA Battery site*

***Photo 48** – View of area near former AAA Battery*

***Photo 49** – Looking north at Marine Corps property in the vicinity of former AAA Battery*

***Photo 50** – Looking northeast from public beach near Marine Corps property*

SHELIA DEVEYDT
Military History Specialist/Team Lead

William K. James
Quality Assurance Specialist
Ammunition Surveillance

APPENDIX M

PROPERTY VISIT PHOTOGRAPHS

NOT APPLICABLE

Selected property visit photographs are included within the text of Appendix L – Property Visit Report

APPENDIX N

RISK ASSESSMENT CODE (RAC) WORKSHEET

NOT APPLICABLE

The September 2005 USACE Formerly Used Defense Sites (FUDS) Program Guidance for Performing Preliminary Assessments under FUDS directed the inclusion of Appendix N as "Risk Assessment Code (RAC) Worksheet" for properties with potential MMRP projects. The MRS Prioritization Protocol will replace the RAC Worksheet in the PA when it has been issued for use by USACE.

NOTE: *The St. Louis District may provide a rough draft of this appendix as a courtesy starting point for the New York District, should an MMRP Project (MRS) be approved.*

APPENDIX O

TAG REVIEW FACT SHEET

NOT APPLICABLE

The September 2005 USACE Formerly Used Defense Sites (FUDS) Program Guidance for Performing Preliminary Assessments under FUDS directed the inclusion of Appendix O as "TAG Review Fact Sheet". A Technical Advisory Group (TAG) no longer reviews the reports, thus, this appendix is obsolete.

APPENDIX P

RESPONSE TO COMMENTS

NOT APPLICABLE

This appendix is intentionally left blank in the DRAFT-FINAL version of the APA.

APPENDIX Q

REPORT DISTRIBUTION

DRAFT-FINAL REPORT DISTRIBUTION

Addressee	No. Copies
Commander, U.S. Army Engineering and Support Center, Huntsville Directorate of Environmental & Munitions Center of Expertise (CX) 4820 University Square P. O. Box 1600 Huntsville, AL 35807-4301 Sent electronically to: Documentation, EMCX HNC@NWO using USACE ftp site ATTN: CEHNC-CX-EG (St. John)	1 (*Electronic*)
U.S. Army Engineer District – New York District ATTN: CENAN-PP-E Jacob K. Javits Federal Building 26 Federal Plaza, Room 1811 New York, NY 10278-0090	1 (*Electronic*)
U.S. Army Corps of Engineers, New England District ATTN: CENAE-PP-M 696 Virginia Road Concord, MA 01742	1 (*Electronic*)

FINAL REPORT DISTRIBUTION

Addressee	No. Copies
Commander, U.S. Army Engineering and Support Center, Huntsville Directorate of Environmental & Munitions Center of Expertise (CX) 4820 University Square P. O. Box 1600 Huntsville, AL 35807-4301 Sent electronically to: Documentation, EMCX HNC@NWO using USACE ftp site ATTN: CEHNC-CX-EG (St. John)	1 (*Electronic*)
U.S. Army Engineer District – New York District ATTN: CENAN-PP-E Jacob K. Javits Federal Building 26 Federal Plaza, Room 1811 New York, NY 10278-0090	1 *(Electronic)*
U.S. Army Corps of Engineers, New England District ATTN: CENAE-PP-M 696 Virginia Road Concord, MA 01742	1 (*Electronic*)

APPENDIX R

REPORT PLATES

REPORT PLATES

Plate 1 – Vicinity Map
Plate 2 – Property Map
Plate 3 – 1954 Aerial Imagery
Plate 4 – 1966 Aerial Imagery
Plate 5 – 1975 Aerial Imagery
Plate 6 – 2013 Aerial Imagery
Plate 7 – Munitions Related AOI

Thematic Computer-Aided Design and Drafting (CADD) map files completed in association with this Abbreviated Preliminary Assessment are based on historic cartographic, aerial and site visit data collected during this investigation. The thematic maps were created using Intergraph's Microstation.

The thematic maps were created by scanning and warping selected historic data to reference points collected from non-stable selected base maps such as U.S. Geological Survey (USGS) 7.5 minute, quadrangle sheets or National Imaging and Mapping Agency (NIMA) maps. The horizontal scale and horizontal datum of the base maps is generally known. In this case the datum used was 1983 North American Datum. Attempts have been made to rectify the data to the referenced base maps; however, distortions in scale and contortions of the features are present. These distortions are a result of inaccuracies in the source data, as well as the processes of scanning and rectifying the data**.** Much of the data on the maps lack sufficient information to support a determination of accuracy.

Many of the historic maps used were hand-drawn or built on locations that were inaccurate by modern standards. In general, historic map inaccuracies are unknown and not quantifiable. The unknown inaccuracies may then be magnified by the georeferencing process; therefore, thematic maps generated from historic maps and drawings will have accuracy no greater than the least accurate source.

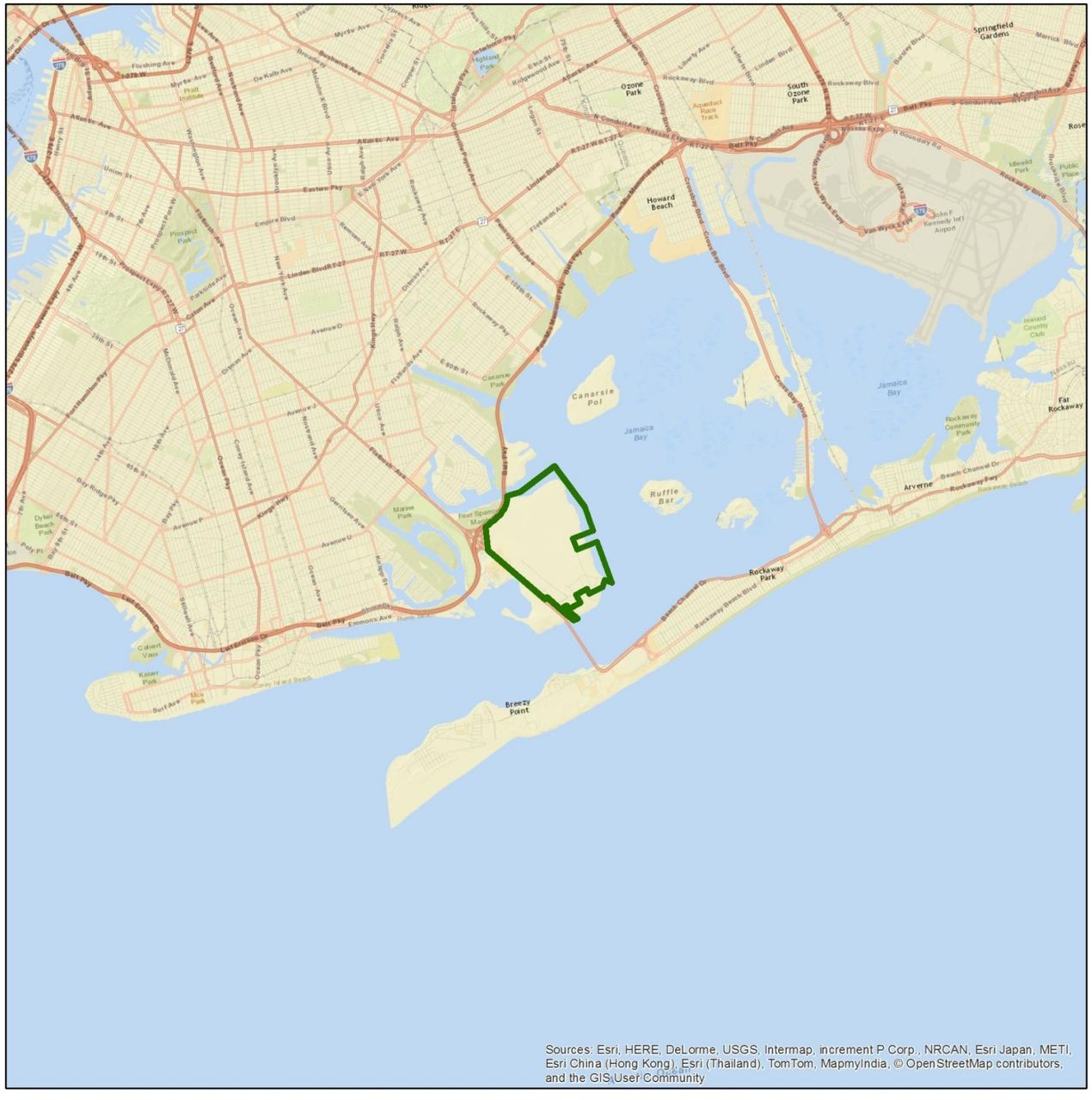
The historical aerial photography has been semi-rectified (georeferenced) to the base map; however, the photos have not been corrected for photogrammetric displacements such as those due to topography or the altitude of the aircraft at the time of imaging. They are not orthorectified images. Locations of features noted on aerial photography are not exact due to the rectifying of both the image and the base map.

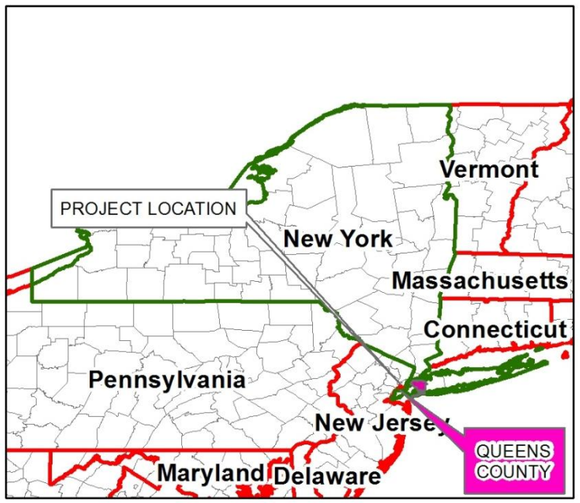
The historical aerial photography is rectified (georeferenced) to the earth using 2D transformation methods. Individual images are scanned using a high-resolution scanner at a pixel resolution of between 600 and 1200 dpi. The ground control used for rectifying the imagery is acquired by selecting photo identifiable features from USGS 1:24,000 Quadrangle maps, and measuring the corresponding location on the photo. In some cases, the historical photography is far too outdated to identify corresponding features within the 1:24,000 quadrangle map, therefore, a more recent set of photos, or USGS

Digital Orthophoto Quarter Quadrangles (DOQQ) may be used as an alternate control source. Great care is taken during the selection and measurement of control data to ensure the resultant rectified imagery will tie as closely as possible to overlapping imagery. In areas of high relief, all attempts are made to reduce rectification error within the target site. The accuracy of feature locations measured from rectified photos may vary, and are dependent upon the location and accuracy of the USGS ground control used and the terrain type within the image area.

The horizontal and vertical locations of selected features noted in the Abbreviated Preliminary Assessment and located on the thematic maps have been established utilizing Global Positioning System (GPS) technology. These coordinates were acquired using the Federal Version PLGR96+ GPS receiver. Features located utilizing GPS techniques are so noted in the Abbreviated Preliminary**.** The PLGR+96 uses the Precise Positioning Service (16 m SEP) and Wide Area GPS Enhancement (WAGE) 4 m CEP**.**

The lineage and source of the historic data used to generate the thematic maps is unknown. The majority of Federal Geographic Data Committee (FGDC) Metadata fields are therefore unknown. A metadata file that gives all available pertinent information has been provided with this product. The statements above are inclusive of all available information regarding the historic data sources and the thematic maps generated. The thematic maps are not original digital mapping data; are scanned and warped data with selected unique feature annotation. The intended purpose of the mapping data is for photo-interpretation and not design. The vector data and associated symbology is unique to the intended purpose. The majority of the digitized features are not part of the current Tri-Service CADD Standards list of features and associated line types and symbology (i.e., range fans, pits, disturbed land). The mapping data produced does comply with applicable Tri-Service Standards.





Legend

APPROXIMATE FUDS BOUNDARY

N

U. S. ARMY CORPS OF ENGINEERS
ST. LOUIS DISTRICT

FLOYD BENNETT FIELD
FUDS PROPERTY NO. C02NY0020
BROOKLYN, NEW YORK
KINGS COUNTY

VICINITY MAP

PROJ. DATE: May 2015		PLATE NO. 1

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Legend

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KINGS COUNTY

PROPERTY MAP

PROJ. DATE: May 2015		PLATE NO. 2

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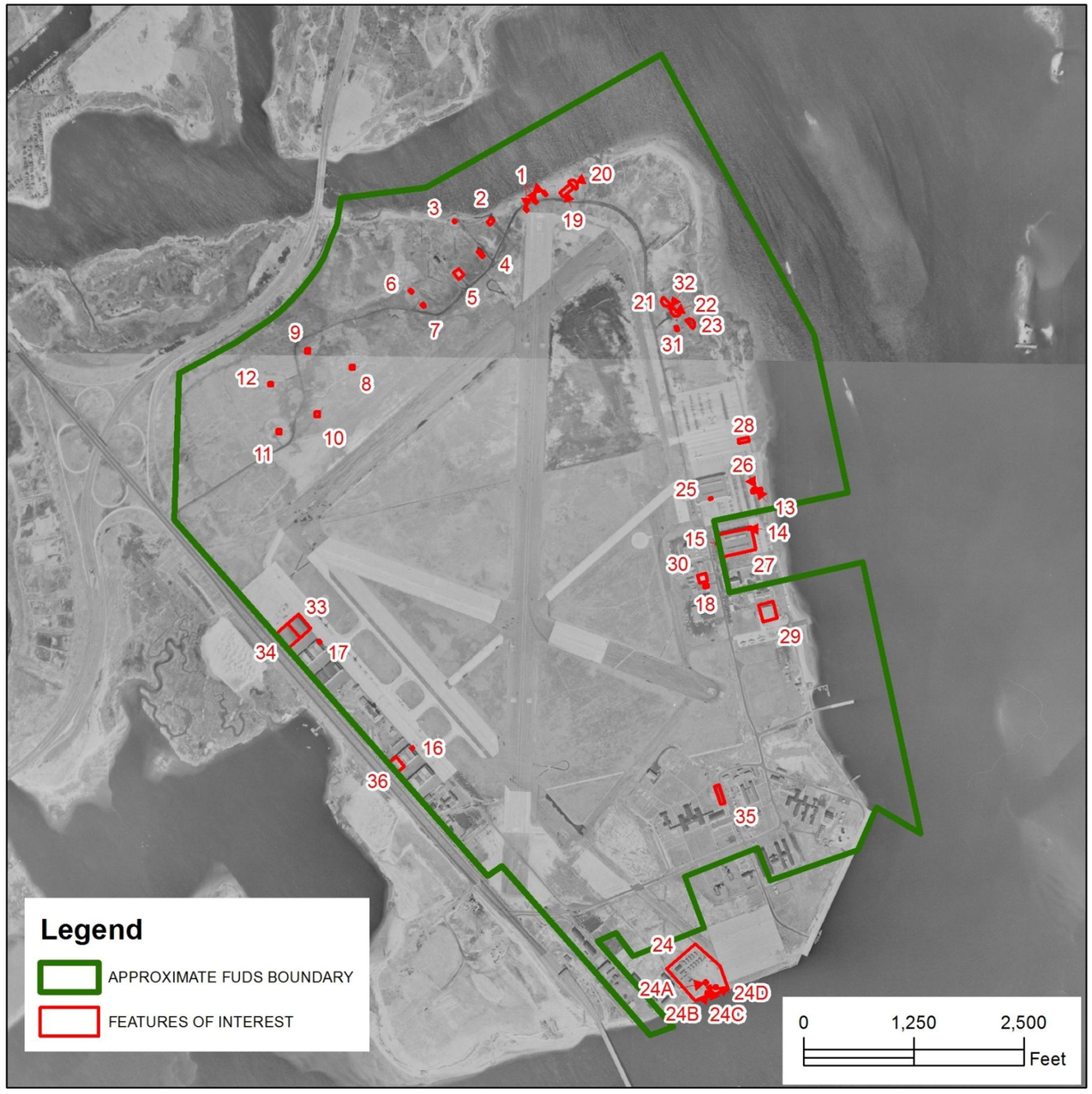

FEATURE NO.	FEATURE DESCRIPTION
1	BUILDING 105 (3 SHOTGUN RANGE HOUSES) (NOT IDENTIFIED)
2	BUILDING 106 (INERT STORAGE)
3	BUILDING 107 (SMOKE DRUM STORAGE)
4	BUILDING 108 (S.A. PYROTECHNICS)
5	BUILDING 109 (PRACTICE BOMB STORAGE)
6	BUILDING 110 (FUSE AND DETONATORS)
7	BUILDING 111 (FUSE AND DETONATORS)
8	BUILDING 112 (H.E. MAGAZINE)
9	BUILDING 113 (H.E. MAGAZINE)
10	BUILDING 114 (H.E. MAGAZINE)
11	BUILDING 115 (H.E. MAGAZINE)
12	BUILDING 116 (WARHEAD)
13	BUILDING 41 (AMMUNITION STORAGE)
14	BUILDING 42 (READY AMMUNITION LOCKER) (NOT IDENTIFIED)
15	BUILDING 43 (READY AMMUNITION LOCKER)
16	BUILDING 44 (READY AMMUNITION LOCKER) (NOT IDENTIFIED)
17	BUILDING 45 (READY AMMUNITION LOCKER) (NOT IDENTIFIED)
18	BUILDING 93 (ORDNANCE SHOP)
19	PISTOL RANGE (NOT IDENTIFIED)
20	BERM (NOT IDENTIFIED)
21	PROPOSED SKEET RANGE (IDENTIFIED ON IMAGERY)
22	PROPOSED SKEET RANGE (IDENTIFIED ON IMAGERY)
23	PROPOSED PISTOL RANGE (IDENTIFIED ON IMAGERY)
24	AAA SITE
24A	POSSIBLE GUN EMPLACEMENT
24B	POSSIBLE GUN EMPLACEMENT
24C	POSSIBLE GUN EMPLACEMENT
24C	POSSIBLE GUN EMPLACEMENT
25	MAGAZINE (NOT IDENTIFIED)
26	MAGAZINE (NOT IDENTIFIED)
27	AMMO STORAGE LOCKER (WITHIN HANGAR) (NOT IDENTIFIED)
28	GUN TEST BACKSTOP (NOT IDENTIFIED)
29	COAST GUARD AMMO LOCKER
30	TORPEDO STORAGE AND PYROTECHNIC READY LOCKER
31	READY AMMUNTION STORAGE LOCKER BLDG 168 (NOT IDENTIFIED)
32	READY AMMUNTION STORAGE LOCKER BLDG 169 NOT IDENTIFIED)
33	HANGAR 9 (POSSBLE INDOOR BORE SIGHT RANGE & TARGET BUTTS)
34	HANGAR 10 ((POSSBLE INDOOR BORE SIGHT RANGE & TARGET BUTTS)
35	INDOOR RIFLE RANGE BLDG 72
36	PISTOL RANGE (HANGAR 4/BLDG 13)

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1954 AERIAL IMAGERY

PROJ. DATE: May 2015		PLATE NO. 3

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FEATURE NO.	FEATURE DESCRIPTION
1	BUILDING 105 (3 SHOTGUN RANGE HOUSES) (NOT IDENTIFIED)
2	BUILDING 106 (INERT STORAGE)
3	BUILDING 107 (SMOKE DRUM STORAGE)
4	BUILDING 108 (S.A. PYROTECHNICS)
5	BUILDING 109 (PRACTICE BOMB STORAGE)
6	BUILDING 110 (FUSE AND DETONATORS)
7	BUILDING 111 (FUSE AND DETONATORS)
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9	BUILDING 113 (H.E. MAGAZINE)
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17	BUILDING 45 (READY AMMUNITION LOCKER) (NOT IDENTIFIED)
18	BUILDING 93 (ORDNANCE SHOP)
19	PISTOL RANGE (NOT IDENTIFIED)
20	BERM (NOT IDENTIFIED)
21	PROPOSED SKEET RANGE (IDENTIFIED ON IMAGERY)
22	PROPOSED SKEET RANGE (IDENTIFIED ON IMAGERY)
23	PROPOSED PISTOL RANGE (IDENTIFIED ON IMAGERY)
24	AAA SITE
24A	POSSIBLE GUN EMPLACEMENT HAS BEEN RAZED
24B	POSSIBLE GUN EMPLACEMENT HAS BEEN RAZED
24C	POSSIBLE GUN EMPLACEMENT HAS BEEN RAZED
24C	POSSIBLE GUN EMPLACEMENT HAS BEEN RAZED
25	MAGAZINE (NOT IDENTIFIED)
26	MAGAZINE (NOT IDENTIFIED)
27	AMMO STORAGE LOCKER (WITHIN HANGAR) (NOT IDENTIFIED)
28	GUN TEST BACKSTOP (NOT IDENTIFIED)
29	COAST GUARD AMMO LOCKER
30	TORPEDO STORAGE AND PYROTECHNIC READY LOCKER
31	READY AMMUNTION STORAGE LOCKER BLDG 168 (NOT IDENTIFIED)
32	READY AMMUNTION STORAGE LOCKER BLDG 169 (NOT IDENTIFIED)
33	HANGAR 9 (POSSBLE INDOOR BORE SIGHT RANGE & TARGET BUTTS)
34	HANGAR 10 ((POSSBLE INDOOR BORE SIGHT RANGE & TARGET BUTTS)
35	INDOOR RIFLE RANGE BLDG 72
36	PISTOL RANGE (HANGAR 4/BLDG 13)

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KINGS COUNTY

1966 AERIAL IMAGERY

PROJ. DATE: May 2015		PLATE NO. 4

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FEATURE NO.	FEATURE DESCRIPTION
1	BUILDING 105 (3 SHOTGUN RANGE HOUSES) (NOT IDENTIFIED)
2	BUILDING 106 (INERT STORAGE)
3	BUILDING 107 (SMOKE DRUM STORAGE)
4	BUILDING 108 (S.A. PYROTECHNICS)
5	BUILDING 109 (PRACTICE BOMB STORAGE)
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24C	POSSIBLE GUN EMPLACEMENT
24C	POSSIBLE GUN EMPLACEMENT
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35	INDOOR RIFLE RANGE BLDG 72
36	PISTOL RANGE (HANGAR 4/BLDG 13)

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KINGS COUNTY

1975 AERIAL IMAGERY

PROJ. DATE: May 2015		PLATE NO. 5

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FEATURE NO.	FEATURE DESCRIPTION
1	BUILDING 105 (3 SHOTGUN RANGE HOUSES) (NOT IDENTIFIED)
2	BUILDING 106 (INERT STORAGE) (NOT IDENTIFIED)
3	BUILDING 107 (SMOKE DRUM STORAGE) (NOT IDENTIFIED)
4	BUILDING 108 (S.A. PYROTECHNICS) (NOT IDENTIFIED)
5	BUILDING 109 (PRACTICE BOMB STORAGE) (NOT IDENTIFIED)
6	BUILDING 110 (FUSE AND DETONATORS) (NOT IDENTIFIED)
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15	BUILDING 43 (READY AMMUNITION LOCKER)
16	BUILDING 44 (READY AMMUNITION LOCKER) (NOT IDENTIFIED)
17	BUILDING 45 (READY AMMUNITION LOCKER) (NOT IDENTIFIED)
18	BUILDING 93 (ORDNANCE SHOP) (HAS BEEN RAZED)
19	PISTOL RANGE (NOT IDENTIFIED)
20	BERM (NOT IDENTIFIED)
21	PROPOSED SKEET RANGE (CANNOT BE IDENTIFIED ON IMAGERY)
22	PROPOSED SKEET RANGE (CANNOT BE IDENTIFIED ON IMAGERY)
23	PROPOSED PISTOL RANGE (CANNOT BE IDENTIFIED ON IMAGERY)
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24B	POSSIBLE GUN EMPLACEMENT
24C	POSSIBLE GUN EMPLACEMENT
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32	READY AMMUNTION STORAGE LOCKER BLDG 169 NOT IDENTIFIED)
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34	HANGAR 10 ((POSSBLE INDOOR BORE SIGHT RANGE & TARGET BUTTS) (BUILDING HAS BEEN RAZED)
35	INDOOR RIFLE RANGE BLDG 72
36	PISTOL RANGE (HANGAR 4/BLDG 13)

N

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KINGS COUNTY

2013 AERIAL IMAGERY

PROJ. DATE: May 2015		PLATE NO. 6

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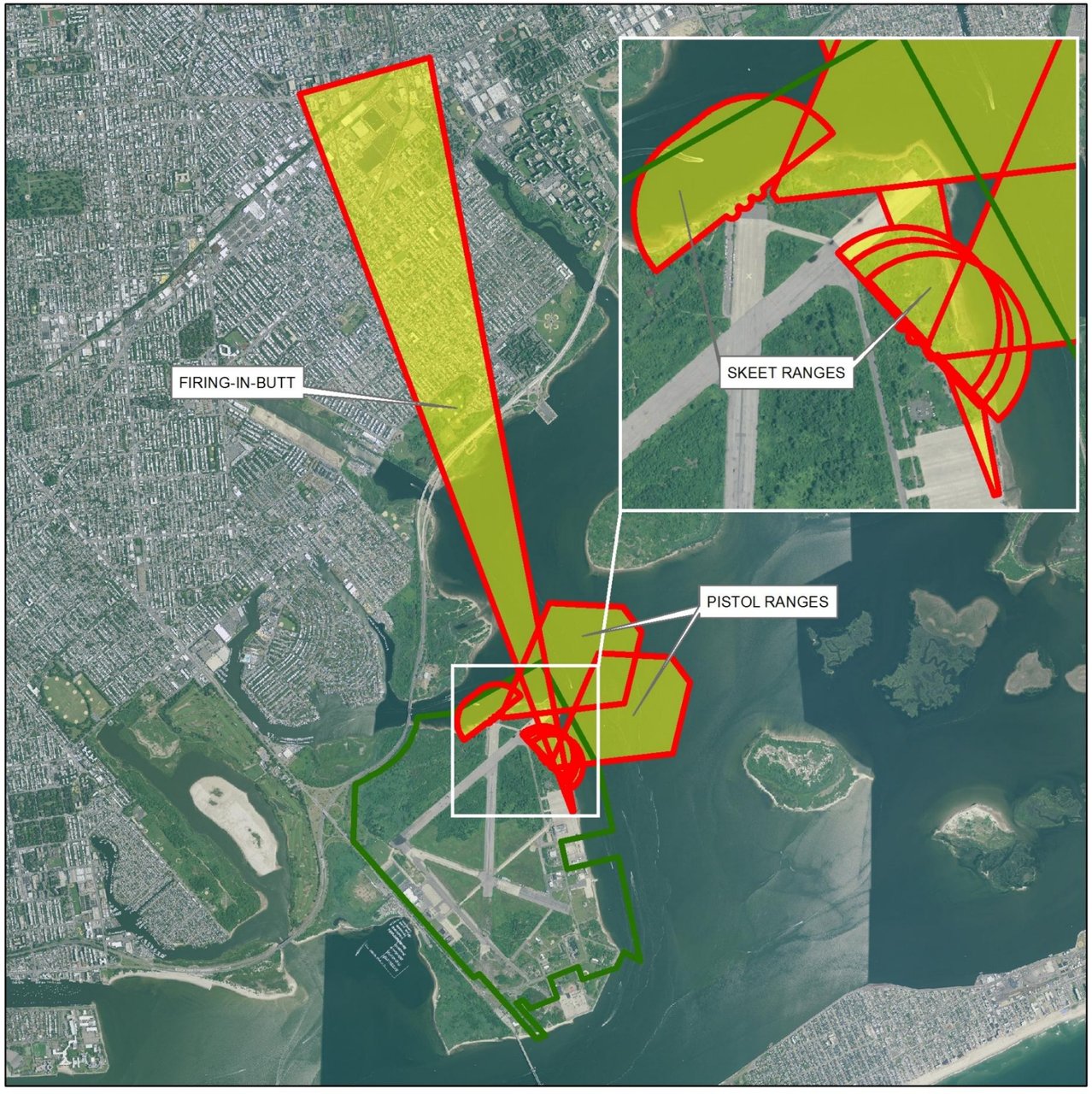

Legend

- APPROXIMATE FUDS BOUNDARY
- SMALL ARMS RANGES

0 3,250 6,500
Feet

N

U. S. ARMY CORPS OF ENGINEERS
ST. LOUIS DISTRICT

FLOYD BENNETT FIELD
FUDS PROPERTY NO. C02NY0020
BROOKLYN, NEW YORK
KINGS COUNTY

MUNITIONS RELATED AOI

PROJ. DATE: Sep 2015		PLATE NO. 7

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