# Phase I Inspection Report
Fresh Air Fund Dam No. 2
Hudson River Basin, Dutchess County, NY
Inventory No. 726

## Title (and Subtitle)
Phase I Inspection Report

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## Distribution Statement
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## Abstract
This report provides information and analysis on the physical condition of the dam as of the report date. Information and analysis are based on visual inspection of the dam by the performing organization.

Examination of available documents and visual inspection of the Fresh Air Fund Dam No. 2 and appurtenant structures did not reveal conditions which constitute a hazard to human life or property.
Using the Corps of Engineers screening criteria for review of spillway adequacy, it has been determined that the dam would not be overtopped under full PMF conditions. The PMF routed through the reservoir required only 41 percent of the spillway outflow capacity. The spillway capacity is therefore adjudged as adequate.

The following remedial measures should be performed within one year from notification:

- Regrade depressed area at the right abutment contact
- Observe wetness at downstream toe of embankment. If flow increases a significant amount, it should be monitored at biweekly intervals with the aid of weirs
- Clean debris and vegetation from the downstream spillway channel, outlet basin, auxiliary spillway channel and embankment surfaces. Provide a program of periodic mowing and cutting of these structures
- Fill depressions and low areas along crest and downstream slope. Monitor for signs of future depressions
- Repair trash racks and clean riser intake chamber
- Recoat exposed reservoir drain pipe with bituminous material
- Mark gate valve stem screw to designate the complete closure of reservoir drain gate
- Provide a program of periodic inspection and maintenance of the dam and appurtenances including yearly operation and lubrication of the reservoir drain. Document this information for future reference. Also develop an emergency action plan.
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PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

FRESH AIR FUND DAM NO. 2
Inventory Number: NY726, Hudson River
DUTCHESS COUNTY, NEW YORK
INVENTORY NO.: NY726

NEW YORK DISTRICT CORPS OF ENGINEERS
AUGUST 1980

DISTRIBUTION STATEMENT A
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PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C., 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigations, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I Investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through frequent inspections can unsafe conditions be detected and only through continued care and maintenance can these conditions be prevented or corrected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aid in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.
PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
FRESH AIR FUND DAM NO. 2
I.D. NO. N.Y. 726
D.E.C. NO. 212D-3254
HUDSON RIVER BASIN
DUTCHESS COUNTY, NEW YORK

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PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

Name of Dam: Fresh Air Fund Dam No. 2
State Located: New York
County Located: Dutchess
Stream: Fishkill Creek
Basin: Hudson River
Date of Inspection: 24 April 1980

ASSESSMENT

Examination of available documents and visual inspection of the Fresh Air Fund Dam No. 2 and appurtenant structures did not reveal conditions which constitute a hazard to human life or property.

Using the Corps of Engineers screening criteria for review of spillway adequacy, it has been determined that the dam would not be overtopped under full PMF conditions. The PMF routed through the reservoir required only 41 percent of the spillway outflow capacity. The spillway capacity is therefore adjudged as adequate.

The following remedial measures should be performed within one year from notification:

- Regrade depressed area at the right abutment contact
- Observe wetness at downstream toe of embankment. If flow increases a significant amount, it should be monitored at bi-weekly intervals with the aid of weirs
- Clean debris and vegetation from the downstream spillway channel, outlet basin, auxiliary spillway channel and embankment surfaces. Provide a program of periodic mowing and cutting of these structures
- Fill depressions and low areas along crest and downstream slope. Monitor for signs of future depressions
- Repair trash racks and clean riser intake chamber

- Recoat exposed reservoir drain pipe with bituminous material

- Mark gate valve stem screw to designate the complete closure of reservoir drain gate

- Provide a program of periodic inspection and maintenance of the dam and appurtenances including yearly operation and lubrication of the reservoir drain. Document this information for future reference. Also develop an emergency action plan

Eugene O'Brien, P.E.
New York No. 29823

Approved by:

Col. W. M. Smith, Jr.
New York District Engineer

Date: 12 Sep 2000
PHASE I INSPECTION REPORT  
NATIONAL DAM SAFETY PROGRAM  
FRESH AIR FUND DAM NO. 2  
I.D. NO. N.Y. 726  
D.E.C. NO. 212D-3254  
HUDSON RIVER BASIN  
DUTCHESS COUNTY, NEW YORK

SECTION 1 - PROJECT INFORMATION

1.1 GENERAL

a. Authority  
The Phase I inspection reported herein was authorized by the State of New York, Department of Environmental Conservation by a letter dated 7 January 1980, in fulfillment of the requirements of the National Dam Inspection Act, Public Law 92-367, dated 8 August 1972.

b. Purpose of Inspection  
This inspection was conducted to evaluate the existing conditions of the dam, to identify deficiencies and hazardous conditions, to determine if these deficiencies constitute hazards to life and property, and to recommend remedial measures where required.

1.2 DESCRIPTION OF THE PROJECT

a. Description of Dam and Appurtenances  
The New York Herald Tribune Pioneer Fresh Air Fund Dam No. 2, presently known as the Fresh Air Fund Dam No. 2, is an earth embankment approximately 1100 feet long, with a maximum height of about 47 feet and a crest width of 17 feet. The grassed downstream slope varies from approximately 1V:2.5H to 1V:3.0H. The upstream slope is 1V:3H, partially protected by riprap to within 15 feet of the crest edge, and grassed from the top of riprap to the crest.

According to available contract drawings (Plates 2 to 11), the embankment consists of essentially two zones of material: an upstream zone consisting of a sandy clay, and a downstream zone consisting of a clayey sand and gravel.

A 36-inch diameter reinforced concrete pipe located near the left abutment serves as the principal spillway for the dam. As indicated on the drawings, the pipe is approximately 90 feet long and is founded on a concrete cradle tied to underlying bedrock with dowels. A rectangular intake
structure (2 feet wide by 5 feet long) is located at the upstream end of the spillway pipe. The structure is constructed of reinforced concrete, has an overflow at El 1040, and is equipped with trash racks.

A riprap protected stilling basin collects spillway discharge. The basin is approximately 50 feet long and has a mid-height width of about 30 feet. Flows exit the basin through an 8 foot wide channel, which, in turn, flows into a natural channel.

An excavated auxiliary spillway channel is located at the right abutment. The channel is approximately 30 feet wide at the base, 6 feet high, and has 1V:3 to 4H side slopes.

A 12-inch diameter corrugated steel reservoir drain is located at the approximate center of the dam. Discharge is controlled by a manually operated center rising screw-type valve, which is supported by a concrete platform approximately 10 feet from the upstream crest edge. The valve controls an inclined sliding intake gate located at the pipe inlet. The gate stem is housed in a protective pipe, which is embedded in and parallel to the upstream slope and is supported by regularly spaced concrete blocks.

A berm exists along the downstream toe of the embankment. The berm is approximately 25 feet wide and has an approximate 1V:3H downstream slope.

According to the contract drawings, a seepage drain (8-inch diameter steel pipe) extends eastward from the service spillway, approximately paralleling the embankment crest. Flow exits the pipe adjacent to the reservoir drain along the downstream slope of the berm.

b. Location

The dam is located on the Sharpe Reservation, Dutchess County, New York. The dam is approximately 2 miles southeast of the intersection of N.Y. State Route 9 and Interstate 84.

c. Size Classification

The dam is 47 feet high and the reservoir has a storage capacity of 594 acre-feet. The dam is classified as "intermediate" in size (40 to 100 feet in height).

d. Hazard Classification

The dam is classified as high hazard due to the large number of camp housing and recreational facilities located approximately 0.25 mile downstream.
e. **Ownership**  
The dam is owned and operated by the Fresh Air Fund located at 300 West 43rd Street, New York City, New York, 10036, Tel. (212) 589-0200.

f. **Purpose of Dam**  
The Fresh Air Fund Dam No. 2 creates a recreational pool for fishing, swimming and boating.

g. **Design and Construction History**  
The dam was designed by the U.S. Department of Agriculture, Soil Conservation Service. For this inspection, a set of contract drawings was provided by the owner. "As-built" dam cross sections, geotechnical design and analysis data, and supervision of construction reports can be found at the Camp Operations Center, located at the main gate to the Reservation. The dam was constructed in 1966; the Contractor's name is unknown.

h. **Normal Operating Procedure**  
Water release from the lake is through the 36-inch RC outlet pipe. As reported by Mr. Seitz, Superintendent of Maintenance, until the time of this inspection, the low level outlet had not been operated.

### 1.3 PERTINENT DATA

<table>
<thead>
<tr>
<th>a. Drainage Area</th>
<th>197 acres</th>
</tr>
</thead>
</table>

**b. Discharge at Damsite**

- Maximum Known Flood at Damsite: Unknown
- Auxiliary Spillway
  - Maximum Pool (Top of Dam): 1535 cfs
- Principal Spillway
  - Maximum Pool: 165 cfs
- Total Spillway Capacity at Maximum Pool Elevation: 1700 cfs

**c. Elevation (U.S.G.S. Datum)**

- Top of Dam: 1047 feet
- Maximum Pool: 1047 feet
- Normal Pool: 1040 feet
- Spillway
  - Upstream Invert: 1032.5 feet
  - Downstream Invert: 1029.5 feet
  - Riser Crest: 1040 feet
  - Auxiliary Spillway Crest: 1042.5 feet
d. Reservoir

Length of Normal Pool 2200 feet
Length of Maximum Pool 2300 feet

e. Storage

Normal Pool 594 acre-feet
Maximum Pool 870 acre-feet

f. Reservoir Surface

Normal Pool 44 acres
Maximum Pool 48.6 acres

g. Dam

Type Earth
Length 1100 ± feet
Maximum Height 47 ± feet
Top Width 17 feet
Side Slopes (V:H)
  Upstream 1:3
  Downstream 1:2.5 to 3.0

h. Reservoir Drain

Type Steel Pipe
Diameter 12-inch
Closure Inclined center rising screw gate valve

i. Service Spillway

Type Reinforced Concrete Pipe
Diameter 36-inch
Location Near Left Abutment
Support Concrete Cradle
Upstream Rectangular Concrete Intake Structure
Downstream Riprap Stilling Basin
j. **Auxiliary Spillway**

<table>
<thead>
<tr>
<th>Type</th>
<th>Excavated Channel</th>
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<tbody>
<tr>
<td>Base Width</td>
<td>30 feet</td>
</tr>
<tr>
<td>Height</td>
<td>6 feet</td>
</tr>
<tr>
<td>Side Slopes</td>
<td>1V:4H</td>
</tr>
<tr>
<td>Location</td>
<td>Left Abutment</td>
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SECTION 2 - ENGINEERING DATA

2.1 GEOLOGY

Fresh Air Fund Dam No. 2 is located in the Hudson Valley Section of the Newer Appalachians Physiographic Province. The bedrock in the section consists of strongly folded beds of shale and limestone of Ordovician Age. The valley lowland areas has low relief, which rarely exceeds 100 feet. Much like the typical Appalachian topography, the area consists of zig-zag ridges, and trellis drainage developed upon pitching anticlines and synclines (Ref. 8).

2.2 SUBSURFACE INVESTIGATION

Limited subsurface investigation information is available for the project. Test pit profiles at the borrow locations indicate that the local soil is dense glacial till consisting mostly of sand with some gravel, with variable depth to bedrock. Bedrock and/or boulders exist at the right abutment and auxiliary spillway channel.

2.3 DESIGN RECORDS

The records available for the project consist of eleven contract drawings which show the plans, sections and details of the dam and appurtenant structures, and a design report issued by the U.S. Soil Conservation Service dated February 4, 1957. Geotechnical records, including compaction, grain-size and triaxial data, stability analysis results and quantity estimates are available at the Camp Operations Center, Sharpe Reservation, Fishkill, New York.

2.4 CONSTRUCTION RECORDS

Construction records are available at the Camp Operations Center. Construction specifications, prepared by the U.S. Soil Conservation Service, are also available at the Center.

As reported by Mr. Seitz, during construction it was decided that the original design height (65 feet) of the dam would be changed to its present height (47 feet). A result of this design modification during construction was the formation of the existing downstream berm.

2.5 OPERATION RECORDS

According to Mr. Seitz, no written maintenance or operation records exist for the project.
2.6 EVALUATION OF DATA

Information obtained from the design drawings and a personal interview with Mr. Seitz is consistent with observations made during this inspection. The information obtained from available data was considered adequate for the Phase I inspection and evaluation.
SECTION 3 - VISUAL INSPECTION

3.1 FINDINGS

a. General
A visual inspection of Fresh Air Fund Dam No. 2 was made on 24 April 1980. The weather was clear and the temperature in the mid-fifties. At the time of the inspection, the lake level was about 1 inch above the intake structure crest elevation.

b. Dam
The earth embankment appears to be in good condition. The vertical and horizontal alignment of the crest appear to be good (See Photographs Nos. 1 and 3). The downstream edge of the crest shows signs of vehicular traffic. Bramble bushes have been planted approximately 5 foot on center along the crest.

The upstream slope shows no signs of erosion and only minor localized sloughing. The riprap zone appears durable and in good condition (See Photograph No. 11). Tall reeds and shrubs (6 to 8 feet tall) are growing in the riprap near the right abutment.

The downstream slope of the dam appears to be in good condition (See Photograph No. 4). There is little to no evidence of erosion along the slope, apparently due to the thick mat of overlying grass. Bramble bushes are located on the slope and downstream berm.

An area located along the downstream berm, approximately 200 feet left and right of the reservoir drain, showed signs of dampness and surface softness. It is uncertain whether the dampness is due to minor seepage or puddling (of downstream runoff) in vehicular tracks. Approximately 100 feet right of the spillway pipe are located two (2) small depressions (See Photograph No. 13), which could be due to erosion or burrowing animals.

c. Service Spillway
The condition of the spillway appears to be good (See Photograph No. 5). The concrete is intact both within the pipe and on the exposed surface, as is the exposed downstream cradle. The downstream cradle is protected by riprap which appears durable and in generally good condition, but cluttered with some wood debris. No seepage was found around the spillway pipe and cradle.

The sides of the stilling basin are protected with riprap (See Photograph No. 6) which appears to be in good condition. The basin bottom shows little sign of sedimentation.
The intake structure appears to be in good condition (See Photograph No. 7). The trash rack angle irons show some signs of deterioration, and have broken loose in two places. Some boulders and twigs were seen at the bottom of the intake structure.

d. **Auxiliary Spillway**
The auxiliary spillway appears to be in good condition (See Photograph No. 8). Exposed bedrock and/or boulders were noted at its base and left slope side. Small trees and bushes are located within the downstream channel.

e. **Appurtenant Structures**
The concrete of the gate operating structure appears to be in good condition (See Photograph No. 10). The valve was operated during this inspection to determine its operability and whether the reservoir drain was clear. The lifting of the gate and the outlet discharge appeared normal. When closing the gate it was determined that the gate can be set below its fully closed position, thereby allowing water to enter above the gate. The crank wheel to operate the valve is located at the Camp Operations Center.

The exposed portion of the reservoir drain at its discharge location is coated with a bituminous material which has deteriorated.

f. **Downstream Channel**
The downstream channel of the service spillway is a relatively narrow channel extending farther downstream into a relatively wooded area. At some locations the channel is cluttered with decayed and fallen trees (See Photograph No. 12).

g. **Reservoir**
The reservoir is bordered by Reservation property which is mostly undeveloped, aside from a few camp affiliated centers. Side slopes adjacent to the reservoir are relatively flat, wooded and show no signs of movement. There are no visible signs of sedimentation problems in the reservoir area.

h. **Abutments**
No seepage was observed at either the left or right abutments. At the right abutment there exists an unpaved service road which extends from reservoir rim, across the embankment crest, down the downstream slope, and for some distance along the downstream toe. It appears that at the intersection of the road and the embankment crest, there is a portion of the crest which is lower than elsewhere along the crest. Under high reservoir levels flow may occur at this contact and be diverted along the downstream toe of the embankment, causing erosion of the toe.
3.2 EVALUATION OF OBSERVATIONS

Visual observations made during the course of the inspection did not indicate any serious problems which would adversely affect the adequacy of the dam and appurtenant facilities. The following is a summary of the problem areas encountered, in order of importance, with the appropriate recommended action:

1. The depressed area at the right abutment contact should be regraded to provide a level surface.

2. The wetness observed at the toe of the downstream slope should be investigated. This wetness should be observed on a bi-weekly basis and if flow increases to a significant amount, it should be monitored at bi-weekly intervals with the aid of weirs.

3. The debris and vegetation from the downstream channel, outlet basin, and auxiliary spillway channel should be removed. Provide a program of periodic inspection and removal.

4. Remove the brush on the embankment slopes, on the crest, and at the downstream toe. Provide a program of periodic cutting and mowing of the embankment surfaces.

5. The depressions along the crest and downstream slope of the embankment should be filled in with well compacted material. Monitor the embankment surfaces for future depressions.

6. Repair trash rack and clean riser intake structure.

7. Recoat exposed reservoir drain pipe with bituminous material.

8. Mark gate valve stem screw to designate the complete closure of reservoir drain gate.

9. Develop an emergency action plan for the project.
SECTION 4 - OPERATION AND MAINTENANCE PROCEDURES

4.1 PROCEDURES

No written operation and maintenance procedures exist for the project. The normal operation of the project consists of allowing water to flow through the service spillway outlet pipe. It is reported that the reservoir drain is never used.

4.2 MAINTENANCE OF DAM

It is reported that maintenance of the dam is performed when the need arises. Maintenance is not considered adequate as evidenced by trash racks, trees and brush, depressions, etc.

4.3 WARNING SYSTEM IN EFFECT

No warning system is in effect or in preparation.

4.4 EVALUATION

The overall condition of the dam and appurtenant structures appears to be good. Recommendations in connection with regular maintenance are discussed in Section 7.
5.1 DRAINAGE AREA CHARACTERISTICS

The drainage area contributing to the Fresh Air Fund Dam No. 2 is 197 acres (0.31 square miles) and is located at Lat. 41°30' and Long. 73°52' (Hydrologic Unit Code 02020008). The pond is approximately twenty-two (22) percent of the total basin area (44 acres) with a length to width ratio of about 1.5 to 1. The drainage area is mostly undeveloped except for the camp facilities. The wooded slopes are fairly steep and there is little storage available over the basin.

5.2 ANALYSIS CRITERIA

Because of the small drainage area size and its short time of concentration, it was assumed that basin runoff would equal the excess rainfall. The Probable Maximum Precipitation (PMP) was taken from Hydro-met Report No. 51 (Ref. 4) and was distributed over 24 hours by the standard EM-1110-2-1411 method (Ref. 3) and converted to runoff. Total rainfall losses over the land area was estimated as 4 inches (0.167 inches/hour). No losses were calculated for rain falling on the lake. The computed inflow hydrograph was input directly and the analysis was performed using the Corps of Engineers computer program, "Flood Hydrograph Package (HEC-1) for Dam Safety Investigations" (Ref. 1).

5.3 SPILLWAY CAPACITY

The principal spillway for the dam is a 36-inch diameter reinforced concrete pipe located near the left abutment. The pipe is approximately 90 feet long and is founded on a concrete cradle. The intake structure is a reinforced concrete riser with crest at El 1040.

A riprap protected stilling basin collects spillway discharge. The basin is approximately 50 feet long and has a mid-height width of about 30 feet. Flow exits the basin via an 8 foot wide riprapped lined channel.

An excavated auxiliary spillway channel is located at the left abutment. The channel is approximately 30 feet wide at the base, 6 feet high, and has 1V to 3 to 4H grassed side slopes.

The computed maximum capacity of the spillway with the water surface at El 1047, equivalent to the top of the dam, is 165 cfs. At this elevation, the capacity of the auxiliary spillway is 1535 cfs.
5.4 RESERVOIR CAPACITY

The normal capacity of the reservoir at El 1040 (spillway crest elevation) is listed as 594 acre-feet (Ref. 5). The surcharge storage between the crest of the spillway (El 1040) and the top of the dam (El 1047) is computed to be 376 acre-feet, which is equivalent to 22.9 inches of runoff over the entire basin. This substantial surcharge storage is sufficient to store the estimated PMP of 22.4 inches.

5.5 FLOODS OF RECORD

There are no records of floods available for the project.

5.6 OVERTOPPING POTENTIAL

The potential of the dam being overtopped was investigated on the basis of the spillway discharge capacity and the available surcharge storage to meet the selected design flood inflow.

The Probable Maximum Flood (PMF) routed through the lake caused the lake surface to rise to El 1043.6, which is approximately 2.5 feet below the top of the dam. The computed PMF peak inflow and outflow discharges were 1430 cfs and 702 cfs, respectively. The one-half PMF routed through the lake caused the lake surface to rise to El 1041.9, or approximately 5 feet below the top of dam. The peak outflow discharge was 300 cfs.

5.7 EVALUATION

The dam has sufficient spillway capacity to pass one-half and the full PMF without overtopping the dam. The spillway capacity is therefore assessed as adequate.
SECTION 6 - STRUCTURAL STABILITY

6.1 VISUAL OBSERVATIONS

Visual observations did not indicate any structural problems with the embankment or appurtenant structures with the reservoir at its present level. There are no adverse conditions which would affect the stability of the dam at the present time.

6.2 DESIGN AND CONSTRUCTION DATA

Design computations and construction records have been located at the Camp Operations Center.

6.3 OPERATING RECORDS

There are no operating records kept. There are no records or reports of any operational problems which would affect the stability of the dam.

6.4 POST-CONSTRUCTION CHANGES

There are no recorded post-construction changes. However, according to Mr. Seitz, the embankment height was modified during construction.

6.5 SEISMIC STABILITY

In accordance with recommended Phase I guidelines, the dam is located in Seismic Risk Zone No. 1. However, based on past local seismic experience, the New York State Geological Survey recommended that the dams site is to be considered in Zone 2. In accordance with the guidelines, a stability analysis is beyond the scope of work.
SECTION 7 - ASSESSMENT/RECOMMENDATIONS

7.1 ASSESSMENT

a. Safety
Examination of the available documents and visual inspections of the Fresh Air Fund Dam No. 2 and appurtenant structures did not reveal any conditions which constitute a hazard to human life or property. The earth embankment is considered to be stable under present conditions.

Using the Corps of Engineers screening criteria for review of spillway adequacy, it has been determined that the dam would not be overtopped for one-half and the full PMF. The principal and auxiliary spillway capacity are, therefore, adjudged as adequate.

b. Adequacy of Information
This report and its conclusions are based on visual inspection, interview data, contract drawings, and office hydrologic/hydraulic studies. This information and data are adequate for a Phase I inspection.

c. Need for Additional Investigations
No additional investigations are required for the project.

d. Urgency
All remedial actions described below should be completed within one year of notification to the owner.

7.2 RECOMMENDED MEASURES

The recommended improvements are as follows:

a. The crest should be regraded to fill depressions and provide a level surface, particularly at the right abutment contact.

b. Wetness and softness along downstream toe of the dam should be observed, particularly at high reservoir levels. Vehicular traffic should be excluded from the toe of the embankment. If flow increases to a significant amount, it should be monitored at bi-weekly intervals with the aid of weirs.

c. The debris and vegetation should be cleared from the downstream channel, outlet basin, auxiliary spillway channel and embankment surfaces. A program of periodic mowing and cutting of the embankment and outlet channels should be provided.
d. The two depressions along the downstream slope should be filled in with stone and monitored for seepage potential and future subsidence.

e. Repair of trash racks and remove debris from intake structure.

f. Recoat exposed reservoir drain pipe with bituminous material.

g. The gate valve stem screw should be marked to designate the position for complete closure of the outlet pipe.

h. Provide a program of periodic inspection and maintenance of the dam and appurtenances including yearly operation and lubrication of the reservoir drain. Document this information for future reference. Also develop an emergency action plan.
APPENDIX A

PLATES
GENERAL NOTES

1. LIMITS OF BORROW AREA WILL BE AS STAKED IN THE FIELD BY THE ENGINEER.

2. ALL WOODED PORTIONS OF BORROW AREA WILL BE CLEARED AND GRUBBED.

3. SOIL AND TOPSOIL SHALL BE STRIPPED FROM THE BORROW AREA TO A MAXIMUM DEPTH OF 10'. STRIPPED MATERIAL WILL BE DISPOSED OF IN BORROWS ADJACENT TO THE BORROW AREA AS DIRECTED BY THE ENGINEER. STRIPPING SHALL BE CONSIDERED SUBSIDIARY TO OTHER ITEMS OF WORK.

1. Area upstream from dam and below abv. 1044.0 shall be included. Proposed area for excess and debris shall be designated in the field by the Engineer.

2. Ballast sediment on bedrock or other substratum shall be removed and still not be paid for, but shall be considered subsurface to other items of work.

3. Common excavation involved in the construction of the principal spillway, stilling basin, pressure spillway outlet channel, entrance channel to the spillway intake and the reservoir at the upstream end of the drainage pipe shall not be paid for. Line shall be considered subsurface to other items of work.

4. Un半天d ing and concrete outlet located in the work that will be removed as part of the contract. Payment shall be made to "Contractor General."

5. Slime cones should be provided by owner to be installed by Contractor.

**SPILLWAY EROSION**

1. Starting on a point approximately 100' west of line, remove all filter material along existing suage drain to the stilling basin. This material may be used in the potential suage drain. Construct drain to line and grade as shown on Sheet 4.

2. Remove as perf. BSWP along this section under the line and grade as shown on Sheet 4.

3. Backfill section of existing suage drain to line as shown on Sheet 4 with fill material and compaction of Section 1, Sheet 4.

4. The reduction shall be considered a lump sum item and shall be paid for as "suage drain reduction."
APPENDIX B
PHOTOGRAPHS
1. VIEW OF CREST LOOKING EASTWARD.

2. UPSTREAM SLOPE VIEWED FROM RIGHT ABUTMENT.
3. UPSTREAM SLOPE VIEWED FROM LEFT ABUTMENT.

4. VIEW OF DOWNSTREAM SLOPE.
5. VIEW OF SERVICE SPILLWAY.

6. SERVICE SPILLWAY STILLING BASIN.
7. CONCRETE INTAKE STRUCTURE FOR SERVICE SPILLWAY. NOTE TRASH RACK.

8. AUXILIARY SPILLWAY CHANNEL, LOOKING UPSTREAM.
9. VIEW OF LOW LEVEL OUTLET PIPE (LEFT) AND SEEPAGE DRAIN PIPE (RIGHT).

10. CONCRETE GATE STRUCTURE FOR LOW LEVEL OUTLET.
II. UPSTREAM SLOPE. NOTE CONDITION OF RIPRAP.

11. UPSTREAM SLOPE. NOTE CONDITION OF RIPRAP.

12. DOWNSTREAM CHANNEL OF SERVICE SPILLWAY. NOTE VEGETATION AND FALLEN TREES.
13. SMALL DEPRESSION LOCATED ON DOWNSTREAM SLOPE.
APPENDIX C

VISUAL INSPECTION CHECKLIST
**VISUAL INSPECTION CHECKLIST**

1) Basic Data

   a. General

      Name of Dam: Tribune Fresh Air Fund
      Fed. I.D. #: NY726
      DEC Dam No.: 2126-8254
      River Basin: Lower Hudson Valley River Basin
      Location: Town Fishkill, County Dutchess
      Stream Name: Fishkill Creek
      Tributary of: _____________
      Latitude (N): 41°30' 30" Longitude (W): 73°52' 24"
      Type of Dam: Earth
      Hazard Category: High
      Date(s) of Inspection: April 24, 1980
      Weather Conditions: Sunny, 50-60°F
      Reservoir Level at Time of Inspection: 3/4" above spillway level

   b. Inspection Personnel

      Mr. Harvey Feldman, Mr. Albert DiBernardo

   c. Persons Contacted (Including Address & Phone No.)

      Mr. William Seitz
      Sharpe Reservation
      Fishkill, New York 12524
      (914) 897-4080 (Office); (914) 897-4107 (Home)

   d. History:

      Date Constructed: 1966
      Date(s) Reconstructed: _____________

      Designer: United States Soil Conservation Service
      Constructed by: _____________

      Owner: Fresh Air Fund, New York, New York.
2) Embankment

a. Characteristics

(1) Embankment Material: Core material impervious, silty-clay; shell material is a clayey sand and gravel, according to drawings.

(2) Cutoff Type: UNKNOWN, however probably impervious core trench.

(3) Impervious Core: Sandy silty clay according to drawings.

(4) Internal Drainage System: 6" corrugated steel pipe set in 2' wide by 5' high granular drain located on d/l's slope extending from service spillway to low level outlet discharge point.

(5) Miscellaneous: Downstream Berm was constructed only to its present height because height of dam was lowered during construction, as reported by Mr. Seitz.

b. Crest

(1) Vertical Alignment: Good, except for vehicular traffic depression (cutting) at downstream crest side.

(2) Horizontal Alignment: Both legs of dam are generally good.

(3) Surface Cracks: None observed.

(4) Miscellaneous: Along crest, planted bramble bushes should be removed or cut. Also minor depression, caused by puddling, should be filled.

c. Upstream Slope

(1) Slope (Estimate) (V:II) 1:3

(2) Undesirable Growth or Debris: Animal Burrows, Reeds, and shrubs should be removed from riprap. Floating debris at water edge should be removed.

(3) Sloughing, Subsidence or Depressions: Minor localized sloughings along entire slope. No subsidence or depressions were observed.
(4) Slope Protection  
Good condition; durable rock revetment appears to extend about 20' into reservoir and 15' from crest edge.

(5) Surface Cracks or Movement at Toe  
Could not be detected - full reservoir.

d. Downstream Slope

(1) Slope (Estimate - V:III)  
1:2 1/2

(2) Undesirable Growth or Debris, Animal Burrows  
Bushes, especially on berm slope, should be removed or cut at 100' right of spillway, 2 to 4' of depressions in rockfill caused by subsidence or erosion.

(3) Sloughing, Subsidence or Depressions  
See Above.

(4) Surface Cracks or Movement at Toe  
None.

(5) Seepage  
Dampness and seepage detected along top of berm in vehicle tracks in area located approximately, 200' to right of low level outlet and extending 200 ft. Wetness also noted at toe of berm on right side, possibly due to runoff along toe contact.

(6) External Drainage System (Ditches, Trenches, Blanket)  
None.

(7) Condition Around Outlet Structure  
Generally good condition, except for fallen trees which should be removed.

(8) Seepage Beyond Toe  
None.

e. Abutments - Embankment Contact  

Roadway at Right Abutment is 6" below crest elevation, will act as auxiliary spillway with discharge occurring along toe of embankment.

2
5) **Reservoir**

a. **Slopes** No signs of slope instability. Reservoir slopes are relatively flat.

b. **Sedimentation** No indication of excessive sedimentation; clear lake water, minor debris.

c. **Unusual Conditions Which Affect Dam** NONE observed

6) **Area Downstream of Dam**

a. **Downstream Hazard (No. of Homes, Highways, etc.)** Campsite area, camp access roads, camp operations buildings, and private homes.

b. **Seepage, Unusual Growth** Crossable marsh - wooded located for approximately 0.5 mile downstream.

c. **Evidence of Movement Beyond Toe of Dam** None observed.

d. **Condition of Downstream Channel** Wooded, with fallen trees & other debris.

7) **Spillway(s) (Including Discharge Conveyance Channel)**

a. **General** 36" reinforced concrete pipe, with concrete intake structure containing stilling vanes and seat. Rip rap placed.

b. **Condition of Service Spillway** Generally good. No evidence of erosion around pipe or concrete cradle. Riser in good condition except for damaged angle irons and boulders at riser floor. Concrete pipe is in very good shape.
(1) Erosion at Contact \textit{None—}

(2) Seepage Along Contact \textit{None—}

3) Drainage System
   a. Description of System \textit{Filter and drain as described above.}

   b. Condition of System \textit{Appears to be operating since flow at discharge point was measurable.}

   c. Discharge from Drainage System \textit{At discharge point, flow was about \( \frac{1}{2} \) gpm.}

4) Instrumentation (Monumentation/Surveys, Observation Wells, Weirs, Piezometers, Etc.)

   Exposed rock located to the left of the service spillway was marked at EL 1024.1 ft.
c. Condition of Auxiliary Spillway

Spillway channel contained brush and trees. Boulders or bedrock are exposed at base and left side of channel.

[Diagram: channel with arrow indicating flow direction, dimensions as measured: 30' - 1' (dimension as measured)]

d. Condition of Discharge Conveyance Channel

Contains numerous brush and trees, with debris.

8) Reservoir Drain/Outlet

Type: Pipe [✓] Conduit [ ] Other [ ]

Material: Concrete [ ] Metal [ ] Other [✓]

Size: 12" outside diameter Length 90 ft (from dam)

Invert Elevations: Entrance [ ] Exit [ ]

Physical Condition (Describe): Unobservable [✓]

Material: Observable and - GOOD [ ]

Joints: Unknown [ ] Alignment Unknown [ ]

Structural Integrity: Exposed pipe at discharge point relatively good condition except for deterioration of bituminous coating.

Hydraulic Capability: Appears to be good during the short time that the gate was opened for this inspection.

Means of Control: Gate [ ] Valve [✓] Uncontrolled [ ]

Operation: Operable [ ] Inoperable [ ] Other [ ]

Present Condition (Describe): Leaks of oil and/or water occurred from stem at least during operation of gate. Had difficulty time closing gate after opened, but realized gate did not return original closed position.
9) Structural
   a. Concrete Surfaces  
      Not Applicable (NA)
      
   b. Structural Cracking  
      N.A.
      
   c. Movement - Horizontal & Vertical Alignment (Settlement)  
      N.A.
      
   d. Junctions with Abutments or Embankments  
      N.A.
      
   e. Drains - Foundation, Joint, Face  
      N.A.
      
   f. Water Passages, Conduits, Sluices  
      N.A.
      
   g. Seepage or Leakage  
      N.A.
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k. Control Gates | N.A. |
l. Approach & Outlet Channels | N.A. |
m. Energy Dissipators (Plunge Pool, etc.) | N.A. |
n. Intake Structures | N.A. |
o. Stability | N.A. |
p. Miscellaneous | N.A. |
APPENDIX D

HYDROLOGIC DATA AND COMPUTATIONS
### TAMS

**Job No.** 1551-05  
**Project** Phases I  
**Subject** Rainfall Distribution  
**Date**  
**By** DLC  
**Chk. by**  

#### Inspected Sheet

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<th>Percent</th>
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- **24 HR PIP for brain ~ 33 in.**
- **Lowest Mean - 15.1 in. (20%) ~ 36.4 in.**
- **Lowest Occurrence - 22.4 in.**

#### Land Area:

- **Notation for Rainfall on 416 Acres Land.**

#### Exposed Hydrologic CONFINEMENT:

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**Note:** The table values are placeholders and should be replaced with actual data.
TAMS

Job No._________ Sheet 2 of_____

Project PHASE 1 INSPECTION Date MAY 1 1980

Subject FRESH AIR FUND DAM + 2

LOCATION LAT. 41° 30' LONG. 73° 59' By D.L.C

Subject

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AT EL 1050 AREA 0
### TAMS

**Job No.** 1551-05  
**Project** Fresh Air Fund Dam No. 2  
**Subject** Hydrologic/Hydraulic Computations  
**Sheet** 4 of 4  
**Date**  
**By** DLC  

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*From River*

\[ H = \tan^2 7.2 \]

*From 36" El. KCP.*

**DAM FL.** 10-47  
**DAM LENGTH** 1000 FT
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### 77-HOUR TOTAL VOLUME

- **875**: 196, 196, 196, 196
- **875**: 196, 196, 196, 196
- **875**: 196, 196, 196, 196
- **875**: 196, 196, 196, 196

### PREMIX STORAGE

- STATION 2: PLAN 1, PLAN 2, PLAN 3, PLAN 4
|          | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
|----------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
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| 10:00    | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
| 11:00    | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
| 12:00    | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
| 1:00     | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
| 2:00     | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
| 3:00     | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
| 4:00     | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
| 5:00     | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |

**MAXIMUM STORAGE**

- 16.44

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**SUMMARY**

- 464.15
- 464.15
- 464.15
- 464.15
<table>
<thead>
<tr>
<th>Waterbody Type</th>
<th>Principal Computed Antecedent Duration of Recurrence</th>
<th>Rate of Return</th>
<th>Exponent</th>
<th>Probability of Occurrence</th>
<th>Rate of Frequency</th>
<th>Total Squared Miles (Square Kilometers)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stream Type 1</td>
<td>1.00</td>
<td>3.00</td>
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<td>0.01</td>
<td>1.0</td>
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<td>1.00</td>
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<tr>
<td>Stream Type 3</td>
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<td>1.00</td>
<td>0.00</td>
<td>0.03</td>
<td>3.0</td>
<td>0.03</td>
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<tr>
<td>Stream Type 4</td>
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<td>0.00</td>
<td>0.04</td>
<td>4.0</td>
<td>0.04</td>
</tr>
</tbody>
</table>

Note: The table above shows the relationship between waterbody types, principal computed antecedent durations of recurrence, rates of return, exponents, probabilities of occurrence, rates of frequency, and total squared miles (square kilometers). The data is presented in a structured format to facilitate easier comprehension and analysis.
References


5. "National Program of Inspection of Dams", Vol. 3, Department of the Army, Office of the Chief of Engineers, 1975


7. "Recommended Guidelines for Safety Inspection of Dams", Department of the Army, Office of the Chief of Engineers, Appendix D
