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NATIONAL DAM SAFETY PROGRAM. INDIAN BROOK RESERVOIR (NY44), LOW--ETC(U)
AUG 78 J B STETSON DACW51-78-C-0035

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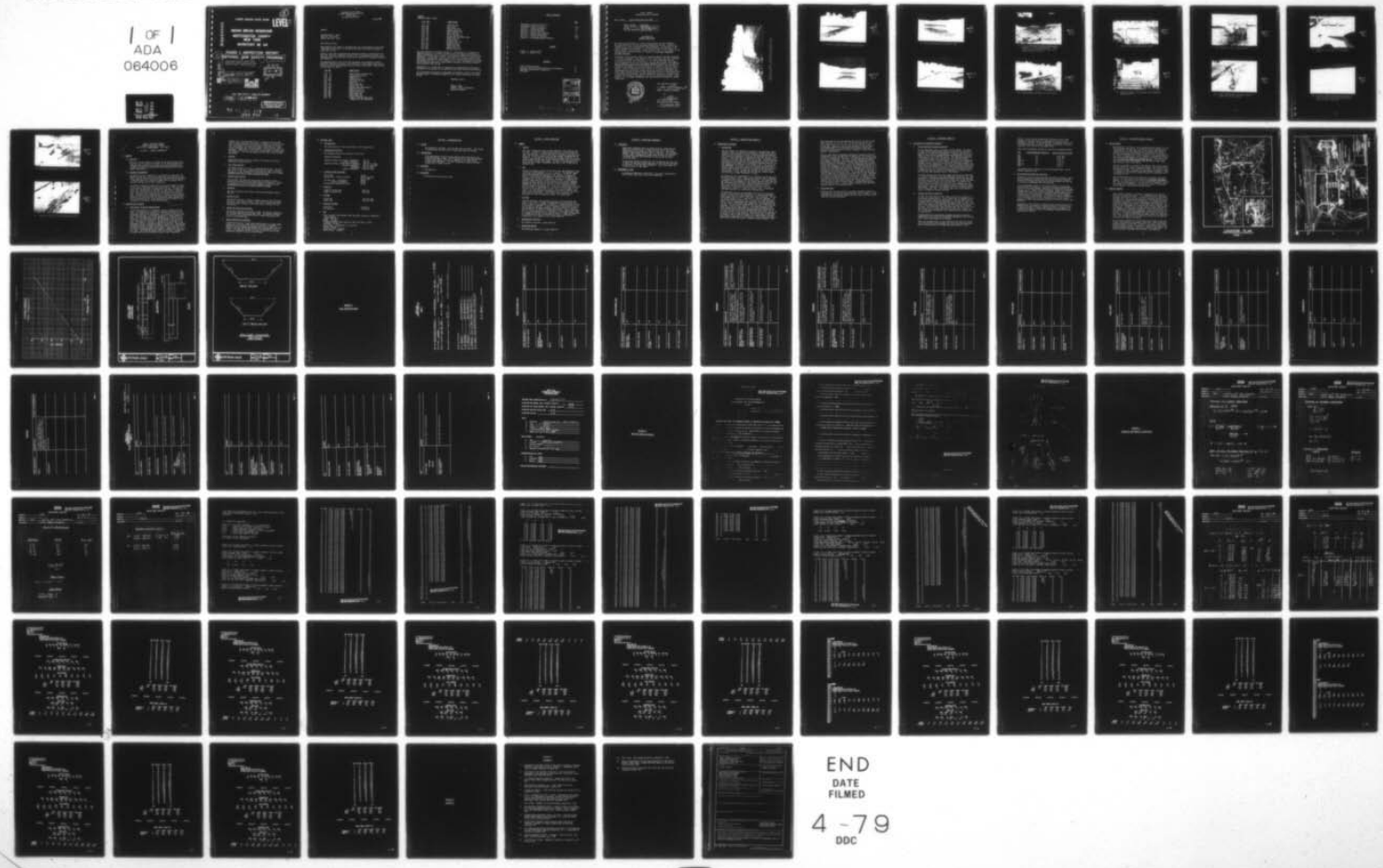

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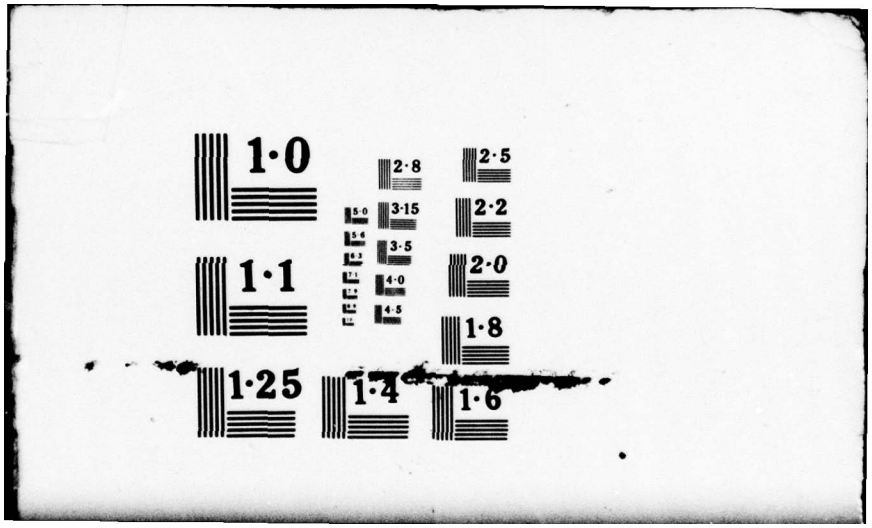
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LOWER HUDSON RIVER BASIN

LEVEL II

INDIAN BROOK RESERVOIR

WESTCHESTER COUNTY
NEW YORK

INVENTORY № 44

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM.

Indian Brook Reservoir (NY44), Lower Hudson River Basin, Westchester County, New York. Phase I Inspection Report,

(15) DACW51-78-C-0035

(10) John B. Stetson

NEW YORK DISTRICT CORPS OF ENGINEERS

(12) 90p. (11) AUGUST 1978

DEPARTMENT OF THE ARMY
U. S. ARMY ENGINEER DISTRICT, NEW YORK
26 FEDERAL PLAZA
NEW YORK, NEW YORK 10007

2 OCT 1978

NANEN-F

Honorable Hugh L. Carey
Governor of New York
Albany, New York 12224

Dear Governor Carey:

The purpose of this letter is to inform you of a clarification of the guidelines used by this office in assessing dams under the National Program of Inspection of Dams.

Office of the Chief of Engineers has recently provided a clarification that dams with seriously inadequate spillways are to be assessed as unsafe, non-emergency, until more detailed studies prove otherwise or corrective measures are completed.

The following dams in your state have previously been assessed as having seriously inadequate spillways, with capability to pass safely only the percentage of the probable maximum flood as noted in each report. They are now to be assessed as unsafe:

I.D. NO.	NAME OF DAM
N.Y. 59	Lower Warwick Reservoir Dam
N.Y. 4	Salisbury Mills Dam
N.Y. 45	Amawalk Dam
N.Y. 418	Jamesville Dam
N.Y. 685	Colliersville Dam
N.Y. 6	Delta Dam
N.Y. 421	Oneida City Dam
N.Y. 39	Croton Falls Dam
N.Y. 509	Chadwick Dam (Plattenkill)
N.Y. 66	Boyds Corner Dam
N.Y. 397	Cranberry Lake Dam
N.Y. 708	Seneca Falls Dam
N.Y. 332	Lake Sebago Dam
N.Y. 338	Indian Brook Dam
N.Y. 33	Lower(S) Wiccopee Dam (Lower Hudson W.S. for Peekskill)

NANEN-F
Honorable Hugh L. Carey

I.D. NO.	NAME OF DAM
N.Y. 49	Pocantico Dam
N.Y. 445	Attica Dam
N.Y. 658	Cork Center Dam
N.Y. 153	Jackson Creek Dam
N.Y. 172	Lake Algonquin Dam
N.Y. 318	Sixth Lake Dam
N.Y. 13	Butlet Storage Dam
N.Y. 90	Putnam Lake (Bog Brook Dam)
N.Y. 166	Pecks Lake Dam
N.Y. 674	Bradford Dam
N.Y. 75	Sturgeon Pool Dam
N.Y. 414	Skaneateles Dam
N.Y. 155	Indian Lake Dam
N.Y. 472	Newton Falls Dam
N.Y. 362	Buckhorn Lake Dam

The classification of "unsafe" applied to a dam because of a seriously inadequate spillway is not meant to connote the same degree of emergency as would be associated with an "unsafe" classification applied for a structural deficiency. It does mean, however, that based on an initial screening, and preliminary computations, there appears to be a serious deficiency in spillway capacity so that if a severe storm were to occur, overtopping and failure of the dam would take place, significantly increasing the hazard to loss of life downstream from the dam.

Consequently, it is advisable to implement the recommendations previously furnished in the reports for the above-mentioned dams as soon as practicable.

It is requested that owners of these dams be furnished a copy of this letter and that copies be permanently appended to all reports previously furnished to you.

Sincerely yours,

CLARK H. BENN
Colonel, Corps of Engineers
District Engineer

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FIGURES

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PHASE I REPORT
NATIONAL DAM SAFETY PROGRAM

Name of Dam Indian Brook Reservoir NY44

State Located New York
County Located Westchester
Stream Indian Brook River
Date of Inspection July 26, 1978

ASSESSMENT OF GENERAL CONDITIONS

The Indian Brook Reservoir is a water supply source for the Village of Ossining, New York. No plans have been located for the dam. The dam is reputed to be a rock filled/earthen cover embankment. On the basis of the visual examination and analysis, it has been concluded that the dam is in need of further investigations. Areas of concern are: a boil located in the aeration basin; previous reports of seepage; and seriously inadequate spillway capacity.

Provisions to significantly reduce all on-going seepage conditions should be a priority requirement. The determination of the source and path of seepage will require further investigations. It is vitally important that the village locate plans for the structure. The spillway has been found seriously inadequate to pass the 1/2 Probable Maximum Flood (PMF), even with the removal of the present set of flashboards on the spillway. The spillway is currently only capable of passing 38 percent of the PMF without the flashboards. Since the spillway has been found to be seriously inadequate it is recommended that immediately, during periods of unusually high runoff, the owner should provide around-the-clock surveilance and have a contingency plan in the event of overtopping. Further hydrologic studies and surveys of the drainage area should be performed to refine the information provided in this report. It is strongly recommended that the spillway flashboards be removed immediately.

STATE OF NEW YORK
DALE ENGINEERING COMPANY, INCORPORATED
LICENSED PROFESSIONAL ENGINEER
NO. 076

Dale Engineering Company

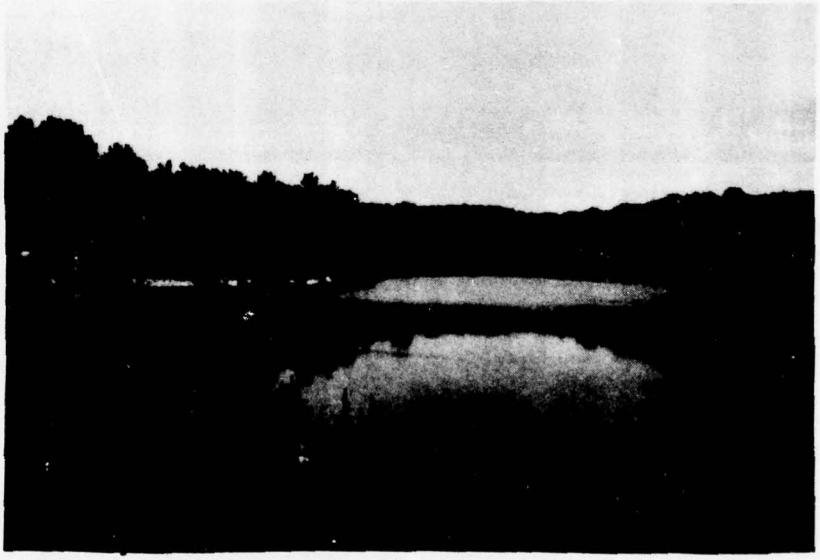
John B. Stetson, President

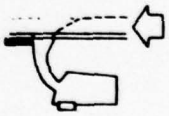
Approved By:
Date:

Col. Clark H. Benn
New York District Engineer
19 September 1978

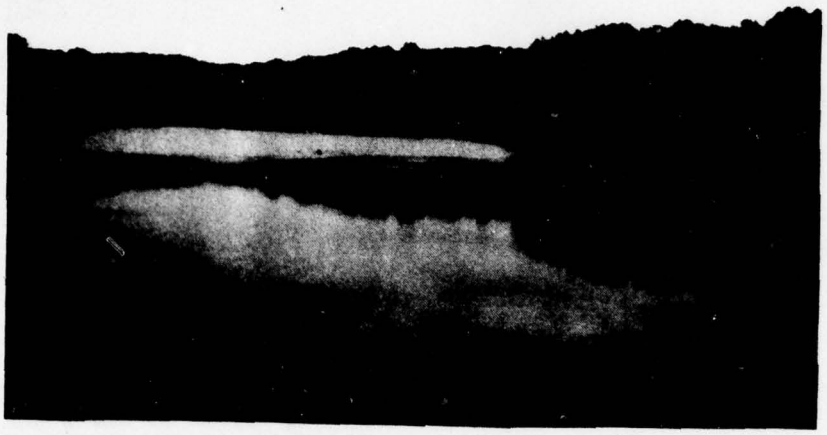
Overview of dam. Structure believed to be constructed of rock fill with earthen cover.

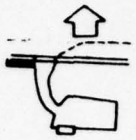
1. View of riprap towards south abutment.





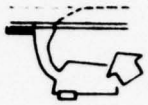
2. View of riprap towards north abutment.



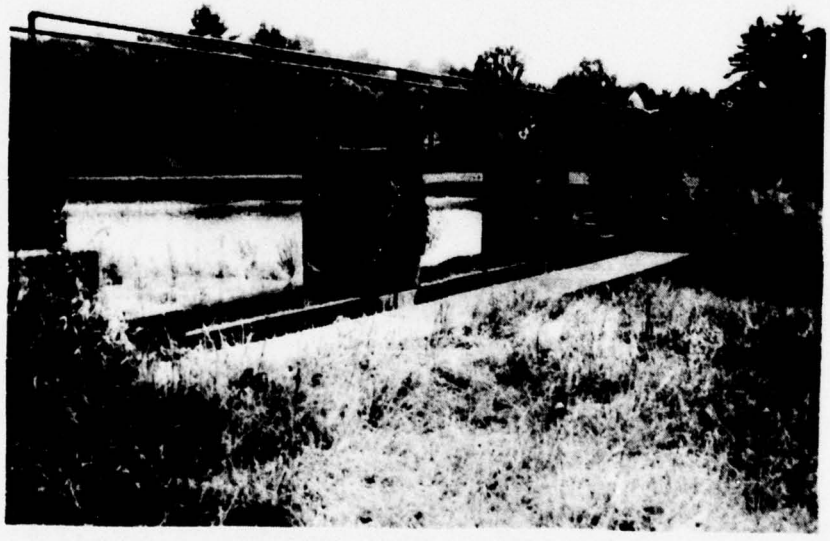


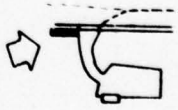
3. View of reservoir area above dam.

4. View looking north across top of dam.

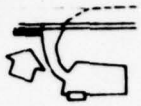


5. View looking north across downstream abutment. Note high grasses. Area being viewed reportedly seeps with high reservoir levels.

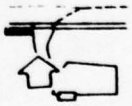




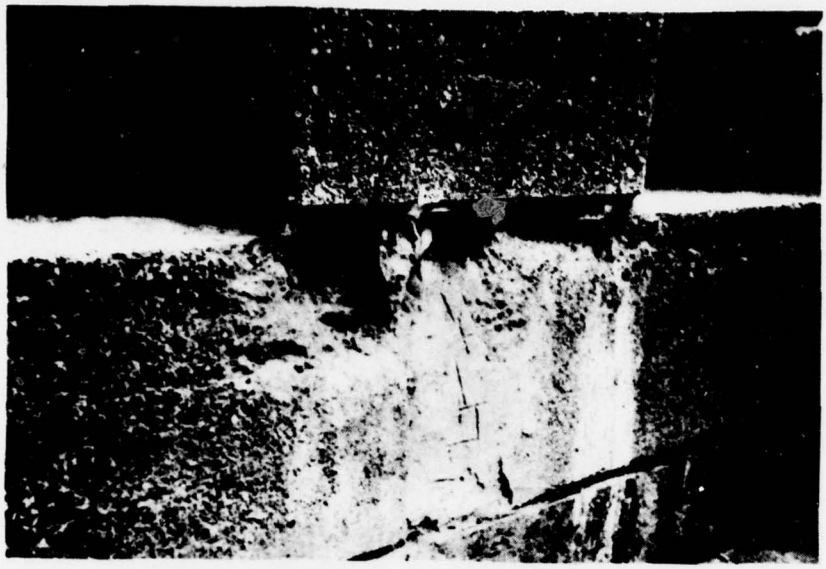
6. View across spillway at top of dam.

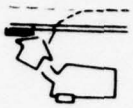


7. Another view looking up spillway.

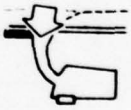


8. Block in center of spillway with damaged spillway sill.

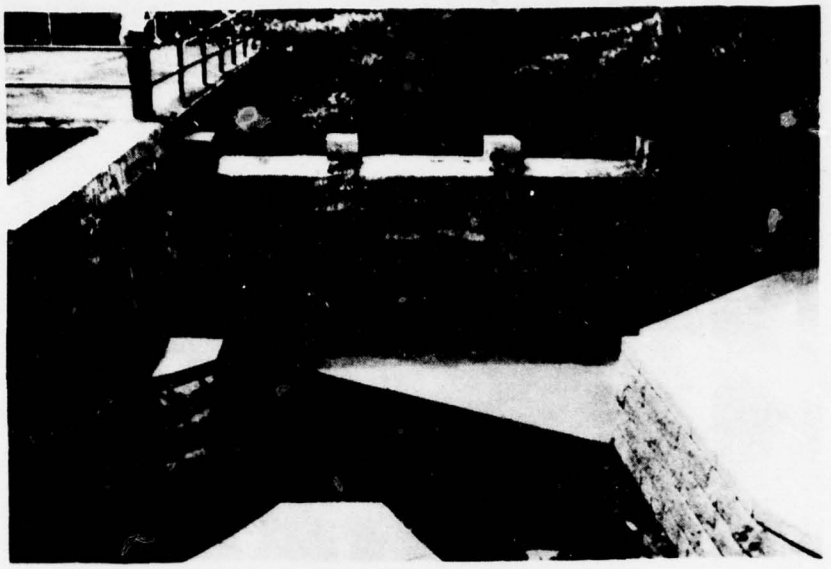


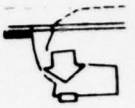


9. Another view of above detail.

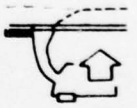


10. View looking down spillway channel toward filtration plant.

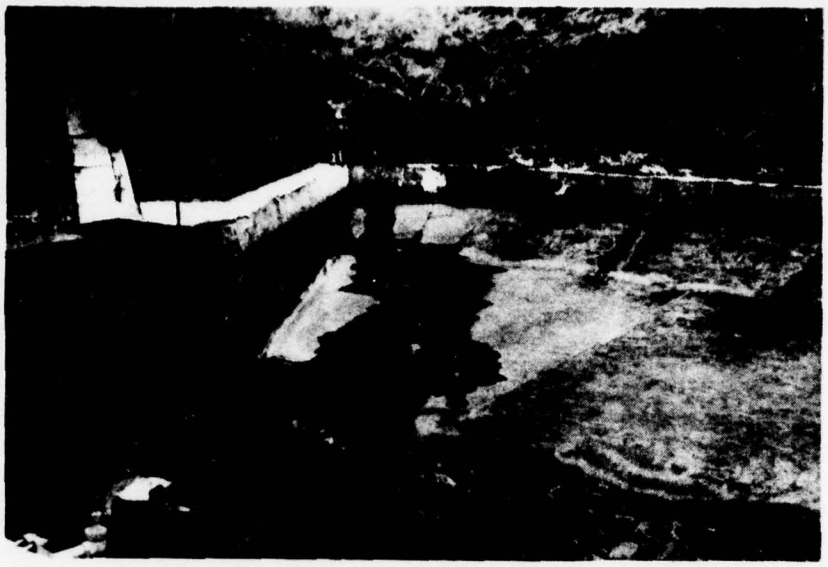




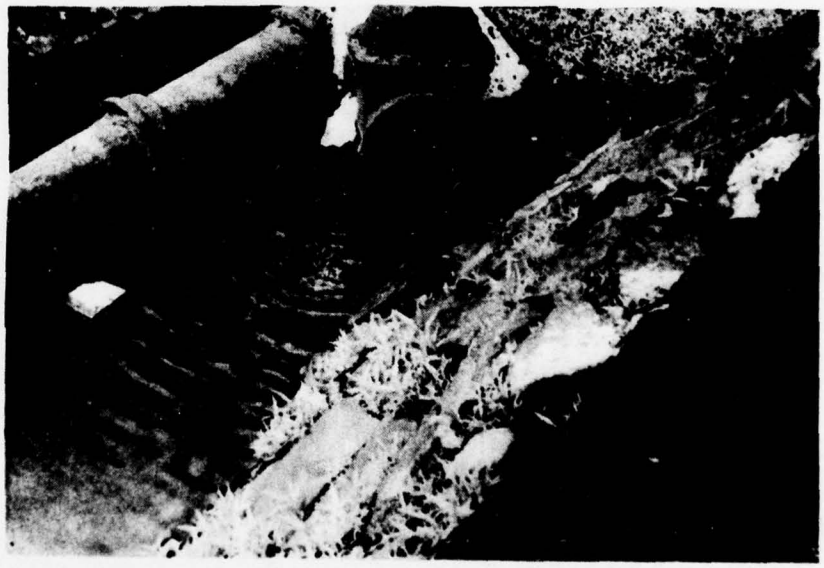
11. Lower spillway weir at filtration plant.



12. Area in center of downstream embankment which sloughed off during storm. Area is dark in picture.



13. Seepage through wall in filtration basin.



14. Closeup of boil in filtration basin area.

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
NAME OF DAM - INDIAN BROOK ID# - NY44

SECTION 1 - PROJECT INFORMATION

1.1 GENERAL

a. Authority

Authority for this report is provided by the National Dam Inspection Act, Public Law 92-367 of 1972. It has been prepared in accordance with a contract for professional services between Dale Engineering Company and The New York State Department of Environmental Conservation.

b. Purpose of Inspection

The purpose of this inspection is to evaluate the structural and hydraulic condition of the Indian Brook Dam and appurtenant structures, owned by the Village of Ossining, New York, and to determine if the dam constitutes a hazard to human life or property and to transmit findings to the State of New York.

This Phase I inspection report does not relieve an owner or operator of a dam of the legal duties, obligations or liabilities associated with the ownership or operation of the dam. In addition, due to the limited scope of services for these Phase I investigations, the investigators had to rely upon the data furnished to them. Therefore, this investigation is limited to visual inspection, review of data prepared by others, and simplified hydrologic, hydraulic and structural stability evaluations where appropriate. The investigators do not assume responsibility for defects or deficiencies in the dam or in the data provided.

1.2 DESCRIPTION OF PROJECT

a. Description of Dam and Appurtenances

Indian Brook Reservoir is reputedly a rockfill dam with earthen cover. No drawings are available to indicate the material from which the structure was constructed. The length of the dam is approximately 500 feet. The height of the dam is approximately 43 feet. The upstream slope of the embankment is riprapped at the waterline. The downstream slope is grassed and is at a slope of 1-1/2 horizontal to 1 vertical. The top width of the dam is 10 feet. The reservoir spillway is located at the north end of the embankment and has an affective width of 34-1/2 feet. The spillway discharges through a trapezoidal masonry channel into Indian Brook. Two sections of the spillway, each 4 feet 7 inches wide are controlled by flashboards which are capable of reducing the pool level by 3 feet. The discharge channel from the spillway is stepped at the upper section and discharges through a steep trapezoidal

channel into a stilling basin which is located at the raw water intake to the filtration plant which is situated at the toe of the dam. Discharge from this stilling basin passes over a spillway into Indian Brook, the receiving stream. Indian Brook is rather heavily overgrown with a gravel bottom in the area at the point of discharge. There exists a low level outlet capable of drawing down the reservoir. The size and capacity of this drain have not been determined.

b. Location

Indian Brook Reservoir Dam is located in the Town of Ossining, Westchester County, New York.

c. Size Classification

The maximum height of the dam is approximatley 40 feet. The storage volume of the dam is approximately 369 acre feet. Therefore, the dam is in the intermediate size category as defined by the Recommended Guidelines for Safety Inspection of Dams.

d. Hazard Classification

Indian Brook, the receiving stream from the reservoir, flows through the residentially developed hamlet of Crotonville. Therefore, the dam is in the high hazard category as defined by the Recommended Guidelines for Safety Inspection of Dams.

e. Ownership

The dam is owned by the Village of Ossining, Westchester County, New York.

f. Purpose of Dam

The dam and reservoir is used as a water supply for the Village of Ossining. The filtration plant at the site is normally shut down during the summer because of poor water quality during this low flow period.

g. Design and Construction History

The dam was reputedly constructed in 1909. No contract drawings of the original construction have been found. The contract drawings for the filtration plant which was built around 1930 show no details of the original dam.

h. Normal Operational Procedures

Although the facility is used only intermittently as a water supply source, the filtration plant located at the foot of the dam is manned by a Water Company employee who periodically checks the condition of the dam and provides normal site maintenance of the facility. This employee resides in a home provided by the Village immediately adjacent to the filtration plant.

1.3 PERTINENT DATA

a. Drainage Area

The drainage area of the Indian Brook is 0.752 square miles.

b. Discharge at Dam Site

No discharge records are available at this site.

Computed Discharges:

Ungated spillway, top of dam, flashboards	343 cfs	
without flashboards	634 cfs	
Ungated spillway, design flood, flashboards	950 cfs	(1/2 PMF)
without flashboards	928 cfs	(1/2 PMF)
flashboards	1650 cfs	(PMF)
without flashboards	1650 cfs	(PMF)

c. Elevation (feet above MSL)

Top of dam	191.96	
Maximum pool - design discharge	192.30	(1/2 PMF)
	192.60	(PMF)
Spillway crest - Flashboards	189.86	
without flashboards	186.96	
Stream bed at centerline of dam	152.00	

d. Reservoir

Length of maximum pool	2700 feet
Length of normal pool	1900 feet

e. Storage

Top of dam	369 acre feet
Normal pool	287 acre feet

f. Reservoir Surface

Top of dam	19.30 acre
Spillway pool	14.72 acre

g. Dam

Type - Rockfill with earthen cover (no plans, source of information questionable).
Length - 500 feet.
Height - 40 feet.
Freeboard between normal reservoir and top of dam - 2 feet.
Top width - 10 feet.
Side Slopes - 2 horizontal to 1 vertical.
Zoning - Unknown.
Impervious core - Unknown.
Grout curtain - Unknown.

SECTION 2 - ENGINEERING DATA

2.1 DESIGN

No information available. No plans were made available. The Village of Ossining has not been able to locate any plans for the dam.

2.2 CONSTRUCTION

A few photographs of the dam taken shortly after construction are being held by the Village. The Village would not make them available to the investigators. The dam is reported to be a rock-filled earthen cover embankment. No other information regarding the dams construction is known to exist.

2.3 OPERATION

See Section 4.

2.4 EVALUATION

No evaluation of data can be made.

SECTION 3 - VISUAL INSPECTION

3.1 SUMMARY

a. General

The visual inspection of Indian Brook Reservoir took place on July 26, 1978. The dam is a water supply reservoir for the Village of Ossining, New York. A filtration plant is located at the toe of the dam. The filtration plants stilling basin abuts the downstream embankment. At the time of inspection the treatment plant was in its normal summer shutdown due to unsatisfactory water quality conditions which typically occur each summer. No plans of the dam were available from the Village. Reportedly, the dam is rock filled with an earthen cover.

b. Dam

The dam is grassed, portions of the top of the dams embankment areas can be seen in Photographs 1, 2, 4, 5, and 12. The dam has reportedly been topped during one event in the 1950's. An area in the center of the downstream embankment had reportedly sloughed off during a storm and has been replaced. The top of the dam has good alignment and no signs of differential settlement. Inspection of material shows some minor surface cracks, but no signs of seepage. Seepage has been reported at the toe of the dam and east abutment. Seepage was found in the wall section of the filtration stilling basin as shown in Photograph 13. A boil was located below this area and can be seen in Photograph 14. The boil, as can be seen in the picture, is discharging quite rapidly. No piping of material was noted. The plant operator indicated the boil has existed for three years and has stabilized. The Village's staff discounts any possibility of the boil being the result of a broken pipe.

c. Spillway

Since no drawings on the dam were available, the spillway was measured in the field. A number of photographs of the spillway were taken as shown in Photographs 6 through 9. Flashboards were in place at the time of inspection. A gravity concrete block which restrains the flashboards has been displaced. Spalling concrete in the back face of the sill is shown in Photographs 8 and 9. The spillway channel is in good condition but is very small. Measurements were taken at a number of sections of the spillway chute. A lower spillway weir is located next to the stilling basin as shown in Photograph 11. Structurally, this appears to be in good condition.

d. Appurtenant Structures

The reservoir area was in good condition.

e. Downstream Channel

The downstream channel is in good condition.

SECTION 4 - OPERATIONAL PROCEDURES

4.1 PROCEDURES

Operational procedures were not observed by the inspection team. Operation of the facility is under the direction of the plant superintendent who resides at a house on the site. The Village employs a Public Works Director who is a engineer. The Department of Public Works encompasses a broad scope of municipal services including operation and maintenance of the dam and the water filtration plant.

During normal operating conditions, the flashboards have been kept in place and the water surface elevation of the reservoir has been at the crest of the spillway flashboards. During the summer the filtration plant is shut down.

4.2 MAINTENANCE OF DAM

As previously mentioned in Section 4.1, the dam is maintained by the Village of Ossining, Public Works Department.

SECTION 5 - HYDROLOGY AND HYDRAULICS

5.1 EVALUATION OF FEATURES

a. Design Data

For this report, no information relevant to the hydrologic and/or hydraulic design for the dam was available. Analysis provided in Appendix C was performed utilizing information obtained from general sources of information listed in the reference section of this report. Indian Brook Dam is reportedly a rock-fill earthen cover structure. No plans were available for the dam. The drainage area contributing to the reservoir was planimetered and found to be approximately 0.752 square miles (information obtained from the village suggested the drainage is 1/3 square miles). The volume of the impoundment is purely a function of natural watershed, while a number of small ponds and lakes do lie upstream of the reservoir. For the dams location, no data was available on the historical flood events. It was reported that the dam was slightly topped once with the spillway flashboards in place.

The purpose of this investigation is to evaluate the dam and spillway with respect to their flood control potential and to determine its adequacy under severe flooding conditions. This potential was assessed in the development of the Probable Maximum Flood (PMF) for the watershed and a subsequent routing through the reservoir. The PMF is that hypothetical flow induced by the most critical combination of precipitation, minimum infiltration loss and concentration runoff of a specific location, that is considered reasonably possible for a particular drainage area.

The hydrologic analysis was performed using the unit hydrograph method to develop the flood hydrograph. In preparing the hydrograph, both Clark and Snyder coefficients were estimated. For the Clark Method values of Tc = 2.48 and R = 1.59 were computed. For the Snyder method, values of Tpr = 1.16 and CP = 0.625 were computed. Two unit hydrographs were developed from these parameters and two sets of hydrographs were computed for the purposes of comparison. The more severe discharge was then used as the flood hydrograph in the spillway analysis. The Probable Maximum Flood (PMF) hydrograph was determined using Probable Maximum Precipitation rainfall data obtained in Hydrometeorological Report No. 51. An index rainfall of 24 inches for 200 square miles for a period of 24 hours was used in the analysis. Both the PMF and 1/2 PMF were evaluated. The 1/2 PMF was assumed to be approximately the Standard Project Flood (SPF) in utilizing U.S. Army Corps of Engineers, Hydrologic Engineering Center's, Computer Program (UHCOMP). The

peak discharges for the Clark Method were 958 cfs for the 1/2 PMF (SPF) and 1,647 cfs for the PMF. The peak discharges for the Snyder Method were 1,277 cfs for the 1/2 PMF (SPF) and 2,190 cfs for the PMF. Hydraulic studies were performed at the spillway. Field measurements of the spillway structure were taken and a sketch of the structure can be found in Appendix C along with the hydraulic computations.

The U.S. Army Corps of Engineers, Hydrologic Engineering Center's, *Program HEC-1 using the Modified Puls Method for flood routing* was applied to evaluate the structure. The spillway was evaluated with and without flashboards. The Clark's Method hydrographs results were adopted. The peak flow discharges were computed with flashboards and without flashboards. No flow reductions were realized. The spillway capacity is 343 cfs with the flashboards and 634 cfs without the flashboards, this capacity relates to 20 percent and 38 percent of the Probable Maximum Flood. Regardless of the use of flashboards, the dam cannot contain the 1/2 PMF (SPF), resulting in overtopping of the dam by one foot. It is believed the spillway could be modified to discharge the 1/2 PMF (SPF) if the flashboards and the center masonry block (see picture) were removed. However, *no analysis has been performed to verify this. In addition, further analysis should be performed to evaluate the spillway's chute capacity and the lower sharp crested weir associated with the stilling basin at the filtration plant. Some modifications may also be required there. Further analysis should verify the drainage area used in this analysis effort.*

b. Experience Data

People at the site were unable to provide information relevant to performance of the spillway during extreme rainfall events. It was indicated that the dam was topped once years ago, the date of that event has not been determined.

SECTION 6 - STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

a. Visual Observations And Data Review

The dam embankment shows no evidence of misalignment, settlement, or significant sloughing which would indicate serious structural movement or distress of the embankment. However, there exists evidence of some on-going seepage through the embankment and at the downstream toe (to be detailed below). The downstream embankment is noticeably steep, and a grassed area was reported to have sloughed off during a storm (undated). Riprap on the embankments upstream face is fair to good. Some large trees exist on what is probably original ground but would now be considered abutment area (both ends of the embankment). The concrete spillway structure and masonry spillway channel, adjacent to the dams northerly abutment, is generally in fair to good condition; some deterioration of the concrete spillway has occurred, and vegetation is growing within the spillway chute through joints in the masonry.

A primary aeration basin and other water supply service structures are located immediately below the embankments downstream toe. What apparently is through-the-embankment seepage from or near abutment locations was outletting at two visible locations through the basin wall which extends along the toe of the slope. A trench in the aeration basin, serving as the location for a drawdown pipe, was experiencing a boil which presumably originates as reservoir underdam seepage. Reportedly, the seepage condition originated approximately three years ago. The concrete slab floor of the aeration basin is cracked at various locations.

b. Geology and Seismic Stability

The New York State Geologic Map (1970) indicates the reservoir is situated on Fordham Gneiss. This foliated rock is composed of biotite, hornblende, quartz and palgioclase. The 1915 State report indicates that the foundation bed under the spillway is rock. The inspection report of 1930 (Appendix B) mentions that the bed of the dam is rock, whereas both the right and left banks are of gravel and rock. The 1930 report also indicates that the cut-off wall for the structure will be set entirely into sound rock. Gravel, as well as any existing weathered rock, would have been removed prior to construction.

Although gneiss has considerable strength and bearing capacity, weathering of the biotite and hornblende components of the rock may yield rotted seams conducive to seepage.

There are no known faults in the vicinity of the reservoir according to the New York State Geologic Map (1970) and the Preliminary Brittle Structures Map of the New York State Geologic Survey

(1977). The two closest known faults indicated are four miles southwest of the dam (across the Hudson River) and four miles northeast of the dam. Of the earthquakes listed below, none of the earthquake epicenters located to the east or southeast of the dam occurred in the vicinity of any known faults.

Some of the earthquakes recorded for the area are tabulated below:

Date	Intensity-Modified Mercalli	Location Relative to Dam
1885	III	9 mi. NW
1885	III	10 mi. NNE
1937	II	4 mi. E
1938 (2)	III	6 mi. S
1941	III	7 mi. SE
1964 (2)	II	6 mi. E
1964	V	6 mi. E

The reservoir dam is located in an area designated Zone 1 on the Seismic Probability Map.

c. Data Review and Stability Evaluation

No design or as-built plans have been available for review. Information transmitted verbally from the Town of Ossining's Engineer indicate he had been informed from a retired employee that the dam is a rock-fill embankment with earthen cover.

The dam embankment appears to be in good condition structurally, except for the noted seepage. Because of progressive-worsening of this type of boil typically associated with a condition of underdam seepage, and to a lesser extent for abutment leakage, provisions to significantly reduce the on-going seepage condition should be considered a priority requirement. The source and path of seepage require further investigation. On the basis of present information it is anticipated that a repair procedure such as clay mineral, chemical or cement pressure-grouting can be utilized to correct the condition.

Maintenance of the reservoir facility should include mowing of embankment grass and removal of vegetation growing in the spillway. It would be prudent to remove large trees close to abutments, to eliminate the potential hazard for embankment damage where storms cause trees to uproot.

SECTION 7 - ASSESSMENT/REMEDIAL MEASURES

7.1 DAM ASSESSMENT

On the basis of the Phase I visual examination and analysis, it has been concluded that the dam is in need of further evaluation and investigation. To date, the owner of the dam has been unable to provide any plans on the design and/or construction of the dam. The dam is reportedly constructed of rock-fill with an earthen cover. Areas of concern are: a boil located in the aeration basin at the toe of the embankment; previous reports of seepage and sloughing, and seriously inadequate spillway capacity. In addition, it was reported by the plant operator that the dam has been topped once during a storm in the 1950's.

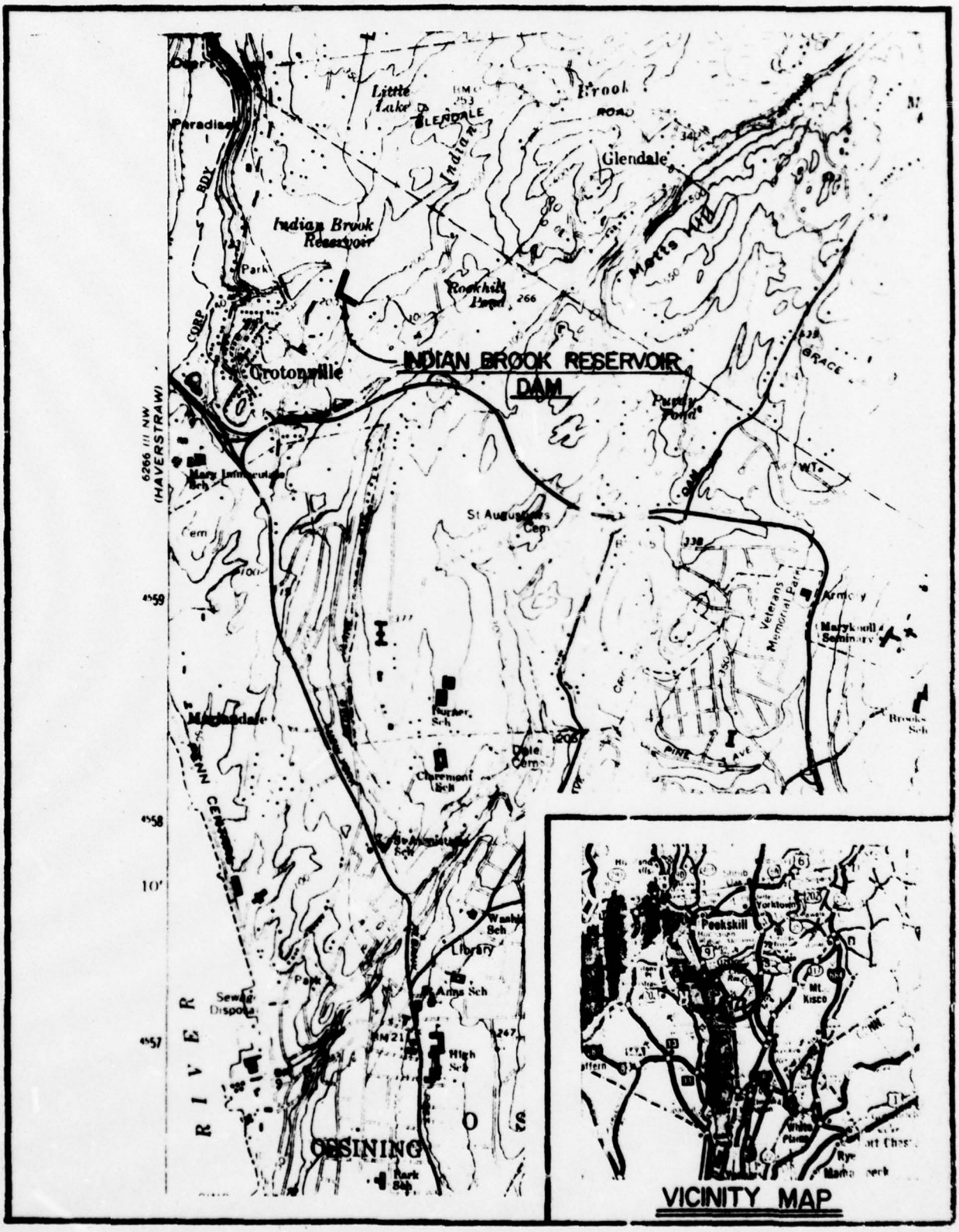
The boil is located in a trench in the aeration basin which presumably originates as reservoir underdam seepage. The boil was first noticed 3 years ago. The concrete slab floor of the aeration basin is cracked at various locations and some seepage is present. There is evidence of some on-going seepage through the embankment and at the downstream toe.

The spillways capacity was evaluated with and without its flashboards. In either case, it was found to be seriously inadequate, however, it is suspected that it could be modified to pass the 1/2 PMF. The spillway capacity is 343 cfs with the flashboards and 634 cfs without the flashboards, this capacity relates to 20 percent and 38 percent of the Probable Maximum Flood.

7.2 REMEDIAL MEASURES

The spillway's capacity is seriously inadequate and the dam was known to be topped previously. It is recommended that immediately, the owner take action so that in periods of unusually high runoff, the owner will provide around-the-clock surveilance and have a contingency plan in the event of overtopping. The flashboards should be removed immediately. Further improvements should not only improve the spillway capacity but include additional freeboard. Removal of the flashboards and increasing the spillway capacity would be adequate. Increasing the spillway capacity without removal of the flashboard is considered inadequate. Until the owner has significantly reduced on-going seepage and increased the spillway capacity, it is strongly recommended that the reservoir be kept at a safe level. Further studies should be made to make this determination. The drainage area of the reservoir should also be measured to confirm the figures used herein.

It is vitally important that the Village locate plans for the dam. Further investigations and remedial action will require some construction details on the dam. The boil in the basin significantly effects the dam's safety. Provisions to substantially reduce the on-going seepage conditions should be a priority requirement. The source and path of seepage require further investigations.



LOCATION PLAN

FIGURE 1

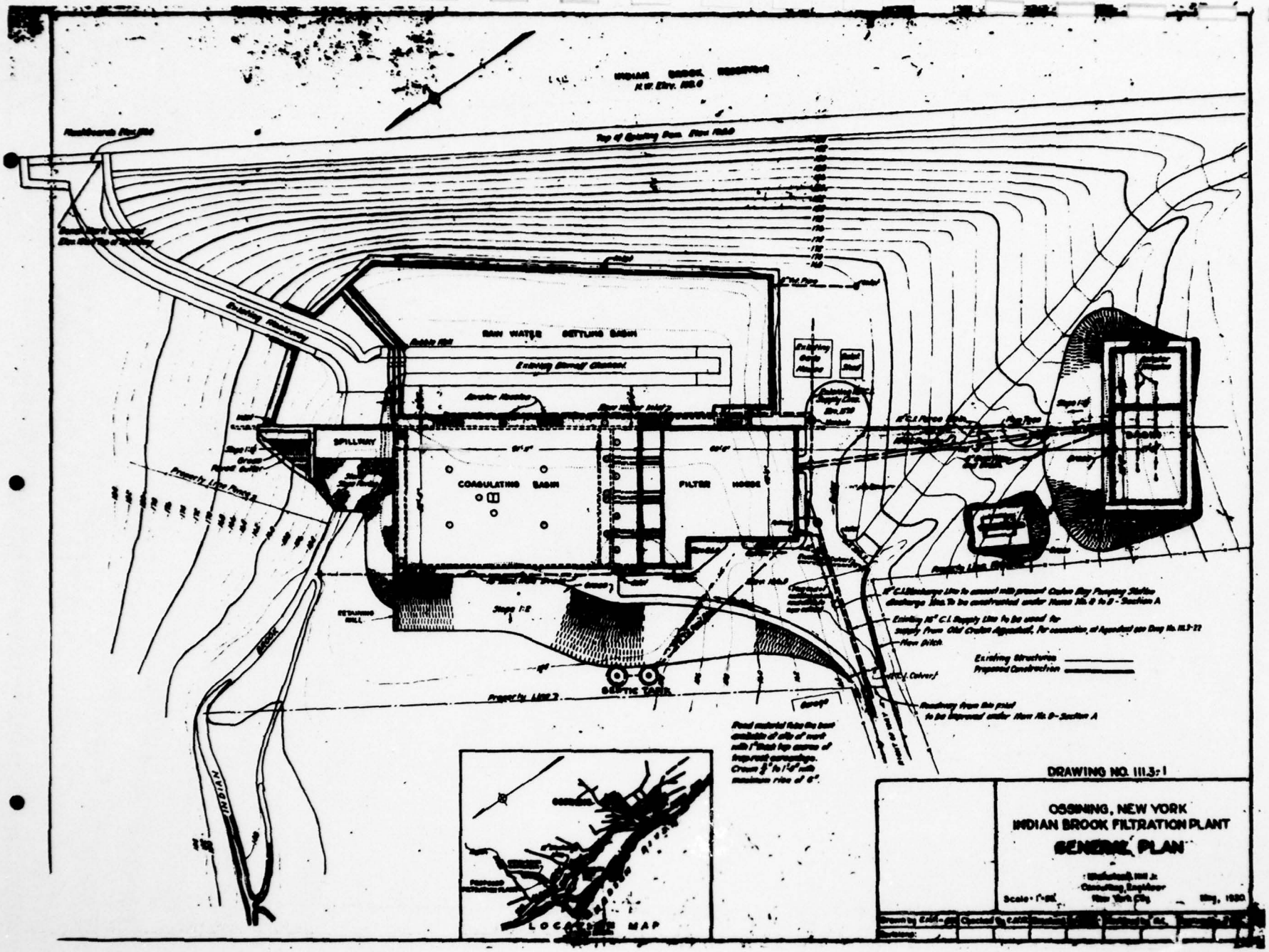
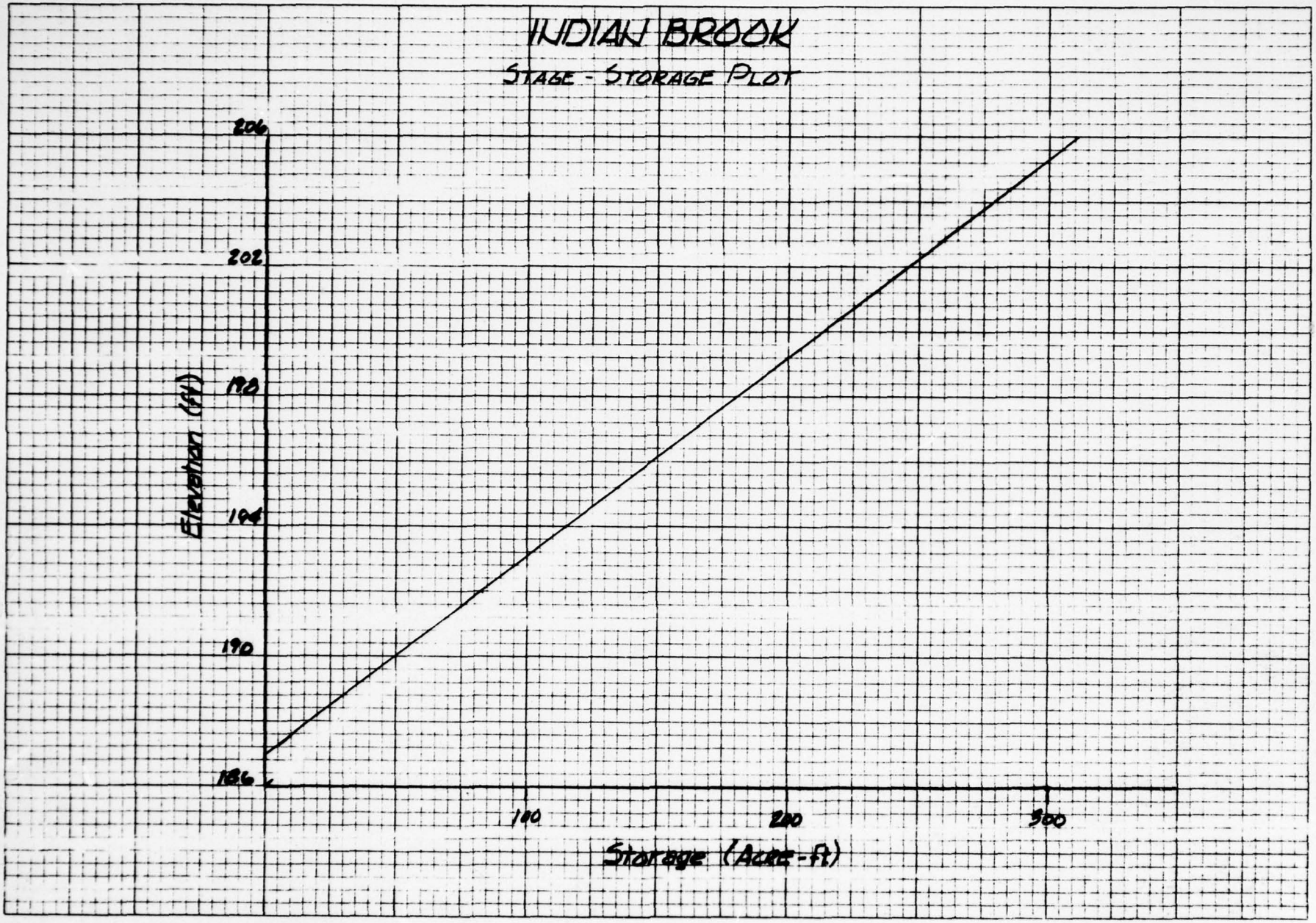

RAW WATER SETTLING BASIN
SPILLWAY
COAGULATING BASIN
FILTER HOUSE
RETAINING WALL
Existing Structures
Proposed Construction
DRAWING NO. 1113-1
OSSINING, NEW YORK
INDIAN BROOK FILTRATION PLANT
GENERAL PLAN
LOCATION MAP

FIGURE 2



STETSON • DALE

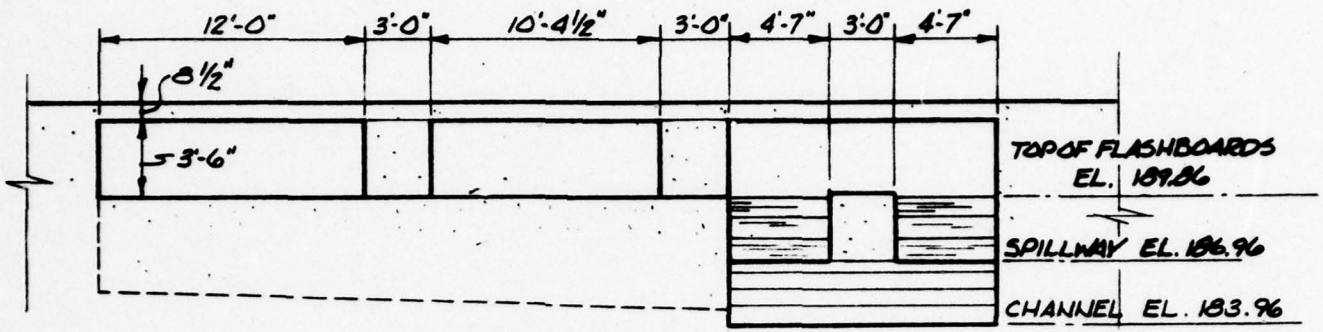
DATE 8-10-78

JOB 2210

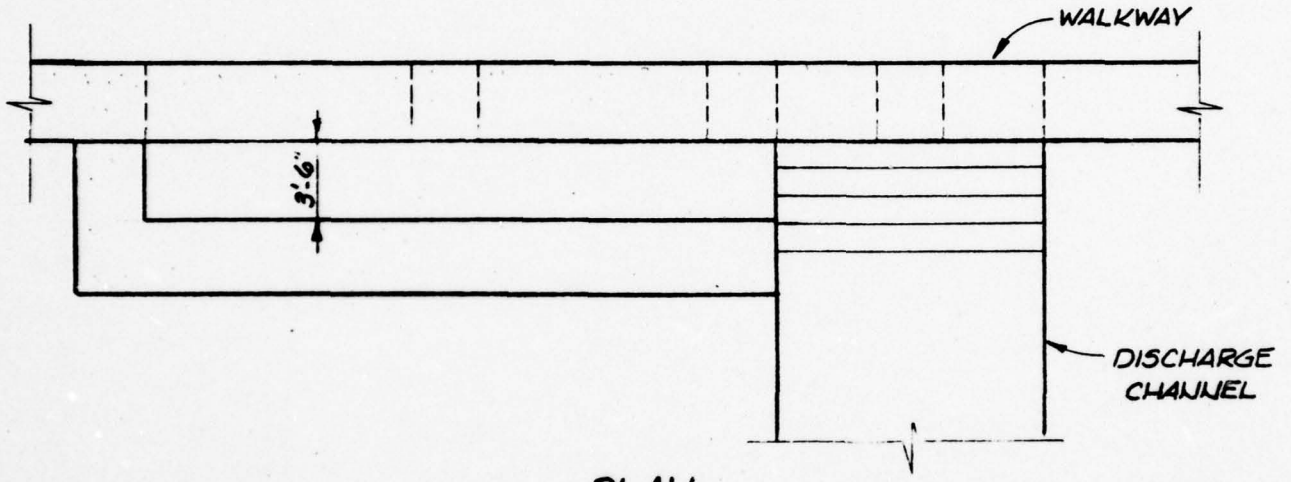
DRAWN JRG

APP'D

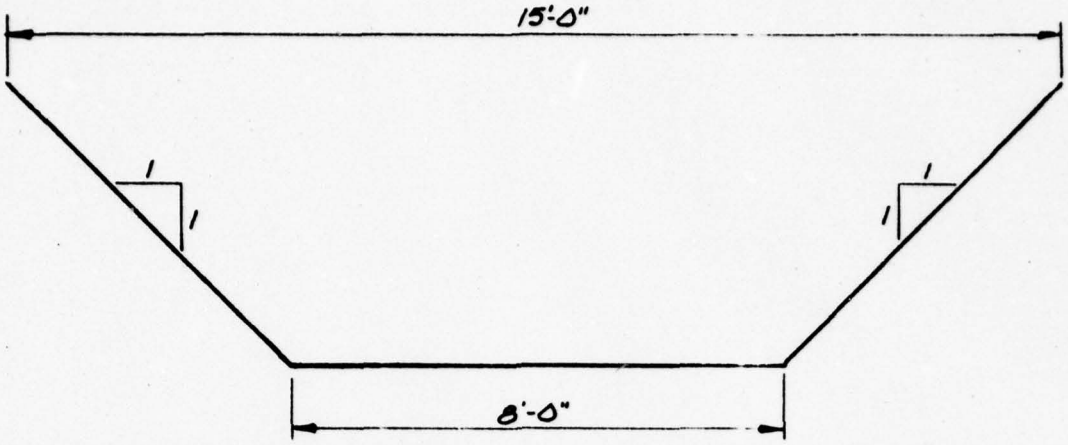
SPILLWAY CHANNEL



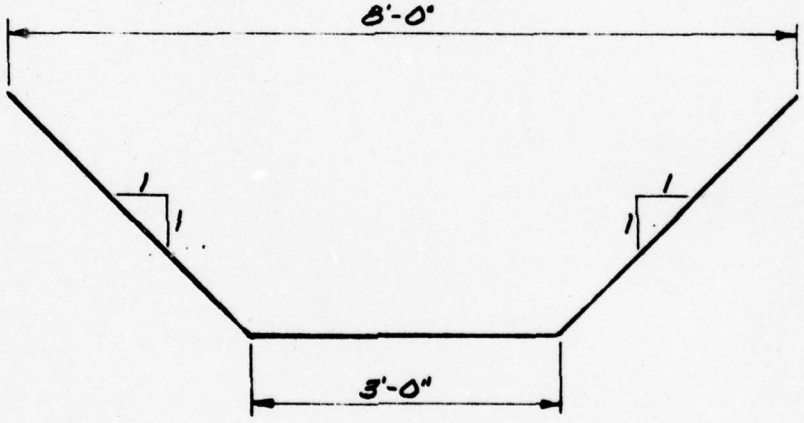
ELEVATION



PLAN



BELOW SPILLWAY



100 FT BELOW SPILLWAY

SPILLWAY CHANNEL SECTIONS

STETSON • DALE	DATE 8.10.78	DRAWN JPG	
	JOB 2210	APP'D	

APPENDIX A

FIELD INSPECTION REPORT

CHECK LIST
VISUAL INSPECTION

PHASE 1

Name Dam INDIAN BROOK RESERVOIR County WESTCHESTER State NEW YORK ID # NY 338

Type of Dam EARTHEN Hazard Category HIGH

Date(s) Inspection JULY 26, 1978 Weather SUNNY Temperature 75-80°

Pool Elevation at Time of Inspection 183.80 M.S.L. Tailwater at Time of Inspection _____

Inspection Personnel:

N. F. DUNLEVY	DALE ENGINEERING CO.	
F. W. BYSZEWSKI	DALE ENGINEERING CO.	
D. F. MCCARTHY	DALE ENGINEERING CO.	
M. STERLACCI, DIV. OF PUBLIC WORKS, OSSINING, N.Y.		
G. F. IRWIN, CHIEF OPERATOR-WATER PLANT, OSSINING, N.Y.		

N. F. DUNLEVY Recorder

CONCRETE/MASONRY DAMS

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
ANY NOTICEABLE SEEPAGE	N/A	
STRUCTURE TO ABUTMENT/EMBANKMENT JUNCTIONS	N/A	
DRAINS	N/A	
WATER PASSAGES	N/A	
FOUNDATION	N/A	

CONCRETE/MASONRY DAMS

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SURFACE CRACKS CONCRETE SURFACES	N/A	
STRUCTURAL CRACKING	N/A	
VERTICAL & HORIZONTAL ALIGNMENT	N/A	
MONOLITH JOINTS	N/A	
CONSTRUCTION JOINTS	N/A	
STAFF GAGE OF RECORDER	N/A	

EMBANKMENT

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SURFACE CRACKS	Small amount of cracks normal and parallel to embankment in center downstream location, 1/3 up bank from toe in an area which previously sloughed and was repaired.	Could be from previous repair work. Should be investigated further.
UNUSUAL MOVEMENT OR CRACKING AT OR BEYOND THE TOE	Boil located below toe in settling basin which is adjacent to the toe of the embankment.	Plant operator said boil has been there for a number of years.
SLOUGHING OR EROSION OF EMBANKMENT AND ABUTMENT SLOPES	Area noted above under surface cracks. The repaired area is approximately 8 feet square.	
VERTICAL AND HORIZONTAL ALINEMENT OF THE CREST	Alignment appears to be unchanged from constructed alignment.	
RIPRAP FAILURES	None observed.	

EMBANKMENT

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
EMBANKMENT COVER CROP	The embankment surface is grassed. This year the village terminated mowing the embankment face.	As in previous years the embankment should be kept cut.
JUNCTION OF EMBANKMENT AND ABUTMENT, SPILLWAY AND DAM	No problems observed.	It was reported when reservoir level is high, seepage occurs at both abutments and at the toe of the dam.
ANY NOTICEABLE SEEPAGE	Seepage noted in west side of settling basin. In addition a boil was located. A drain pipe on the east side of the basin was discharging below a moist section of the embankment.	
STAFF GAGE AND RECORDER	None.	
DRAINS	None. Some drains along settling basin.	

UNGATED SPILLWAY

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONCRETE WEIR	Generally the condition of the concrete is good. A masonry element in the center of the weir has become loose. (See Photograph in this report.)	
APPROACH CHANNEL	None.	
DISCHARGE CHANNEL	Spillway chute discharges into a spillway settling basin (not area previously discussed) and discharges over top of another sharp, crested weir.	
BRIDGE AND PIERS	None.	

GATED SPILLWAY

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONCRETE SILL	None.	
APPROACH CHANNEL	None.	
DISCHARGE CHANNEL	None.	
BRIDGE AND PIERS	None.	
GATES AND OPERATION EQUIPMENT	None.	

OUTLET WORKS

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CRACKING AND SPALLING OF CONCRETE SURFACES IN OUTLET CONDUIT	Not observable.	
INTAKE STRUCTURE	Not observable.	
OUTLET STRUCTURE	Pipe size undetermined. Sheet B-3 shows two 16-inch pipes. Valve obstructed and reported won't run a full pipe.	
OUTLET CHANNEL	Overgrown; gravel lined. Not eroded.	
EMERGENCY GATE	None.	

DOWNSTREAM CHANNEL

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONDITION (OBSTRUCTIONS, DEBRIS, ETC.)	Overgrown.	
SLOPES	Stable.	
APPROXIMATE NO. OF HOMES AND POPULATION	A number of homes in the community of Crotonville would be affected downstream.	

INSTRUMENTATION

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
MONUMENTATION/SURVEYS	None.	
OBSERVATION WELLS	None.	
WEIRS	None.	
PIEZOMETERS	None.	
OTHER	None.	

RESERVOIR

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SLOPES	Virtually no overbank slopes at reservoir's edge. Drainage area free of exposed earth materials. Upland areas raised above reservoir a couple hundred feet.	
SEDIMENTATION	None observed.	

CHECK LIST
ENGINEERING DATA
DESIGN, CONSTRUCTION, OPERATION
PHASE 1

NAME OF DAM Indian Brook

ID # NY 338

ITEM	REMARKS
AS-BUILT DRAWINGS	None.
REGIONAL VICINITY MAP	See this report.
CONSTRUCTION HISTORY	See this report for available data.
TYPICAL SECTIONS OF DAM	See this report for available data.
OUTLETS - PLAN - DETAILS - CONSTRAINTS - DISCHARGE RATINGS	See this report for available data.
RAINFALL/RESERVOIR RECORDS	None. Visual observations only.

ITEM	REMARKS
DESIGN REPORTS	None.
GEOLOGY REPORTS	None.
DESIGN COMPUTATIONS HYDROLOGY & HYDRAULICS DAM STABILITY SEEPAGE STUDIES	None.
MATERIALS INVESTIGATIONS BORING RECORDS LABORATORY FIELD	None.
POST-CONSTRUCTION SURVEYS OF DAM	None.
BORROW SOURCES	None.

ITEM	REMARKS
MONITORING SYSTEMS	None.
MODIFICATIONS	None.
HIGH POOL RECORDS	Only visual observations.
POST CONSTRUCTION ENGINEERING STUDIES AND REPORTS	None.
PRIOR ACCIDENTS OR FAILURE OF DAM DESCRIPTION REPORTS	None.
MAINTENANCE OPERATION: RECORDS	None.

ITEM	REMARKS
SPILLWAY PLAN SECTIONS DETAILS	See this report for available data.
OPERATING EQUIPMENT PLANS & DETAILS	See this report for available data.

CHECK LIST
HYDROLOGIC & HYDRAULIC
ENGINEERING DATA

DRAINAGE AREA CHARACTERISTICS: 0.732 Square Miles

ELEVATION TOP NORMAL POOL (STORAGE CAPACITY): 189.86

ELEVATION TOP FLOOD CONTROL POOL (STORAGE CAPACITY): 189.86

ELEVATION MAXIMUM DESIGN POOL: 191.96

ELEVATION TOP DAM: 191.96

CREST:

a. Elevation 186.96 concrete weir, 189.86 flashboards.
b. Type Concrete
c. Width 10 feet
d. Length 34.5 feet
e. Location Spillover North abutment
f. Number and Type of Gates None

OUTLET WORKS: (Drawdown)

a. Type Cast iron
b. Location North side of embankment
c. Entrance Inverts --
d. Exit Inverts --
e. Emergency Draindown Facilities None

HYDROMETEOROLOGICAL GATES:

a. Type None
b. Location None
c. Records None

MAXIMUM NON-DAMAGING DISCHARGE: ---

APPENDIX B

PREVIOUS INSPECTION REPORTS

STATE OF NEW YORK

DEPARTMENT OF PUBLIC WORKS

DIVISION OF ENGINEERING

ALBANY

Dam No. 33

Watershed Lower Hudson

Application for the Construction or Reconstruction of a Dam

Application is hereby made to the Superintendent of Public Works, Albany, N. Y., in compliance with the provisions of Section 18 of the Conservation Law (see last page of this application) for the approval of specifications and drawings marked Ossining, N. Y. Indian Brook Filtration Plant Drawings No. 111.3-1 - 22 inclusive.

herewith submitted for the construction / reconstruction of a dam herein described. All provisions of law will be complied with in the erection of the proposed dam. It is intended to complete the work covered by the application about Nov. 30th 1940.

1. The dam will be on Indian Brook flowing into Croton River in the town of Ossining, County of Westchester and two (2) miles north of the Village of Ossining
(Give exact distance and direction from a well-known bridge, dam, village main cross-roads or mouth of a stream)

2. Location of dam is shown on the Tarrytown quadrangle of the United States Geological Survey.

3. The name of the owner is Village of Ossining, Board of Water Commissioners

4. The address of the owner is Ossining, N. Y.

5. The dam will be used for water supply

6. Will the proposed dam be built upon or its pond flood any State lands? No

7. The drainage area above the proposed dam is 1.38 square miles.

8. The dam will create a pond area at the spillcrest elevation of 0.31 acres and will impound 10 cubic feet of water.

B-1

9. The maximum height of the proposed dam above the bed of the stream i... 1

10. The lowest part of the natural shore of the pond is 3 feet vertically ... and everywhere else the shore will be at least 3 feet above the spillcrest.

11. State if any damage to life or to any buildings, roads or other property could be ca... failure of the proposed dam. No

12. The natural material of the bed on which the proposed dam will rest is (clay, sand, grave... shale, slate, limestone, etc.) Rock

13. Facing down stream, what is the nature of material composing the right bank? Gravel

14. Facing down stream, what is the nature of the material composing the left bank? Gravel

15. State the character of the bed and the banks in respect to the hardness, perviousness, wate... of exposure to air and to water, uniformity, etc. Cut-off wall of structures will 2 feet into sound rock entirely across valley.

16. Are there any porous seams or fissures beneath the foundation of the proposed dam? Unk...

17. WASTES. The spillway of the above proposed dam will be 30 feet long in the c... will be held at the right end by a retaining wall the top of which will be ... the spillcrest, and have a top width of 2 feet; and at the left end by a struc... the top of which will be 2 feet above the spillcrest, and have a top width of ...

18. The spillway is designed to safely discharge 520 cubic feet per s...

19. Pipes, sluice gates, etc., for flood discharge will be provided through the dam as follo... 1 16" diameter blow-off, sluice gate controlled.

20. What is the maximum height of flash boards which will be used on this dam? ...

21. APRON. Below the proposed dam there will be an apron built of ... feet long across the stream, 20 feet wide and 1 ... thick.

22. Does this dam constitute any part of a public water supply? No

The total length of this dam is [illegible] feet, the weir portion, is about ~ 2 feet long, and the crest of [illegible] is about ..... c ..... feet below the top of the dam.

The number, size and location of discharge pipes, and of pipes or gates which may be used for drawing off the water from behind the dam, are as follows:

1 - 16" pipe [illegible]

At the time of this inspection the water level above the dam was 4 ft. [illegible] in. below the crest of the spillway.

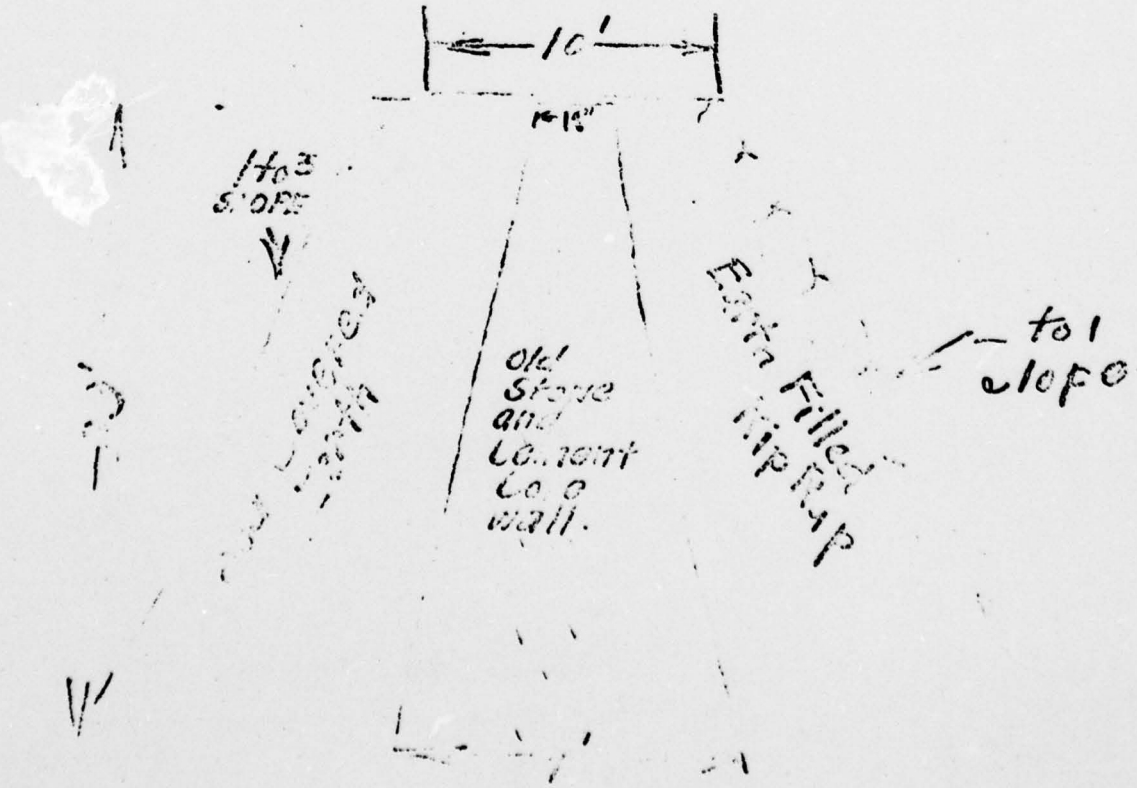
(State briefly, in the space below, whether, in your judgment, this dam is in good condition, or bad condition, describing particularly any leaks or cracks which you may have observed.)

This dam is in [illegible]
and I found it [illegible]
[illegible]
[illegible] and Flowage [illegible]

Reported by [illegible]

[illegible] R. I. D. [illegible]

OTHER SECTION



APPENDIX C

HYDROLOGIC AND HYDRAULIC COMPUTATIONS

DESIGN BRIEF

DESIGNED BY JPG DATE 8 7 78

CHECKED BY PAGE C-1 OF

PROJECT NO. 2210 SHORT TITLE NY DAM INSPECTION

DESIGN SUBJECT INDIAN BROOK RESERVOIR REF. DWGS.

ESTIMATE OF CLARK'S PARAMETERS

ESTIMATE OF T_c (BPR)

$$T_c = (11.9\ L^3/H)^{.385} = (11.9\ (1.932)^3/305)^{.385} = .614\ HR$$

SCS

$$L = \frac{\ell^{.8}\,(S+1)^{.7}}{1900\,Y^{.5}} = \frac{(10200)^{.8}\,(3.89+1)^{.7}}{1900\,(3.0)^{.5}}$$

$$S = \frac{1000}{CN} - 10 = 3.89$$

$$= \frac{4890.985}{3290.897} = 1.486$$

$$T_c = L/1.6 = 1.486/1.6 = 2.48\ HR$$

NORTH ATLANTIC DIV WATER RESOURCES STUDY (FEB 72)

$$(T_c + R) = 10\,(Q)\,(DA/5)^{.25}$$

$$= 10\,(1.82)\,(.752/140)^{.25} = 4.92$$

$R/(T_c + R) = .39$
$R/(4.92) = .39$
$R = 1.92$

$1.92/(T_c + 1.92) = .39$
$1.92 = .39(T_c + 1.92)$
$1.92 = .39\,T_c + .75$
$3.00 = T_c$

DESIGN BRIEF

DESIGNED BY NFD DATE 8.10.78

CHECKED BY PAGE C-2 OF

PROJECT NO. 2210 SHORT TITLE NY DAM INSPECTIONS

DESIGN SUBJECT INDIAN BROOK RESERVOIR REF. DWGS.

ESTIMATE OF SNYDER'S PARAMETERS

6.40 C_p =

$C_p = 0.625$

$C_T = 1.20$

$t_p = C_t (L \times L_{ca})^{0.3}$

$t_p = 1.2 (1 \times .5)^{0.3}$

$t_p = 0.95$

$t_r = t_p / 55 = .17$

$t_{pr} = t_p + 0.25 (t_R - t_r)$

$t_p = 1.16$

SUMMARY OF PARAMETERS

CLARK'S		SNYDER'S
BPR	$T_c = 0.614$ hr	$t_{pr} = 1.16$
SCS (CN METHOD)	$T_c = 2.48$ hr $R = 1.59$	$C_p = 0.62$
NORTH ATLANTIC DIV	$T_c = 3.00$ hr $R = 1.92$	

$R/(T_c + R) = 0.39$

DALE

DESIGN BRIEF

DESIGNED BY NFD DATE 8.10 78

CHECKED BY PAGE C-3 OF

PROJECT NO. 220 SHORT TITLE NY DAM INSPECTIONS

DESIGN SUBJECT INDIAN BROOK RESERVOIR REF. DWGS.

D-A-D RELATIONSHIPS

DURATION	DEPTH	% OF INDEX
6 HR	28.2	107
12 HR	29.5	122
24 HR	32.9	137
48 HR	36.5	151
72 HR	38.3	159

Index Rainfall

24.0

BASE FLOWS

5 sq. mi w/ 2.0 cfs = 3.0

LOSS RATES

INITIAL LOSS = 1.0
CONSTANT LOSS = 0.1

DESIGN BRIEF

DESIGNED BY UFD DATE 8.17.78

CHECKED BY PAGE C-9 OF

PROJECT NO. SHORT TITLE

DESIGN SUBJECT REF. DWGS.

Summary of Uncomp Runs

					Peak Discharge
SPF	Clark's Parameters	Tc	2.48	R 1.57	958
	Snyder's Parameters		1.79	0.50	1277
PMF	Clark's Parameters				1647
	Snyder's Parameters				2190

```
UNIT GRAPH AND HYDROGRAPH COMP JULY 1966 (REVISED AUGUST 1974)
HYDROLOGIC ENGINEERING CENTER (HEC)
DAVIS,CA


--- OPERATIONS AVAILABLE ---

TIME INT = SET TIME INTERVAL OF ALL COMPUTATIONS
UNIT H   = COMPUTE UH BY INPUT, CLARK, OR SNYDER
RAIN     = INPUT RAIN AND LOSS RATE DATA
RUNOFF   = INPUT BASEFLOW, COMPUTE & PRINT HYDROGRAPH
PNT      = PRINT UNIT HYDROGRAPH ONLY
STOP     = STOP EXECUTION OF PROGRAM

USER MUST SELECT OPERATION DESIRED
MAY RETURN TO ANY OPERATION


SELECT 1-6 (1=TIME INT,2=UNIT H,3=RAIN,4=RUNOFF,5=PNT,'6=STOP)      1
ENTER TIME INTERVAL(MIN)=    60.


SELECT 1-6 (1=TIME INT,2=UNIT H,3=RAIN,4=RUNOFF,5=PNT,'6=STOP)      2
ENTER DRAINAGE AREA (SQMI) =      0.75
SELECT 1-3 (1=INPUT UH, 2=CLARK, 3=SNYDER )       2
ENTER NUMBER OF TIME-AREA ORDINATES (0=NONE)=     0
ENTER CLARKS TC AND R (HRS) =        2.48       1.59

      TP       CP       TC       R

    1.98    0.568     2.48     1.59


SELECT 1-6 (1=TIME INT,2=UNIT H,3=RAIN,4=RUNOFF,5=PNT,'6=STOP)      3
ENTER RATIO  IMPERVIOUS =         0.00
SELECT 1-3 ( 1=RAIN, 2=SPS, 3=PMS )       2
ENTER SPS INDEX RAINFALL (IN) = 12.00
ENTER TRSPC AND TRSDA (SQMI) =            1.00       0.75
SELECT 1-3 (1=INIT+CONST, 2=ACUM LOSS, 3=SCS)       1
ENTER INITIAL LOSS(IN), CONSTANT LOSS(IN/HR) =      1.00       0.10


SELECT 1-6 (1=TIME INT,2=UNIT H,3=RAIN,4=RUNOFF,5=PNT,'6=STOP)      4
ENTER A TITLE PLEASE -   INDIAN SPF
ENTER STRTQ,QRCSN,AND RTIOR =        2.00     2.00     1.00
```

HR	MIN	RAIN	LOSS	EXCESS	UNIT HG	RECSN	FLOW
1	0	0.00	0.00	0.00	42.	2.	2.
2	0	0.00	0.00	0.00	124.	2.	2.
3	0	0.00	0.00	0.00	139.	2.	2.
4	0	0.00	0.00	0.00	87.	2.	2.
5	0	0.00	0.00	0.00	46.	2.	2.
6	0	0.00	0.00	0.00	24.	2.	2.
7	0	0.01	0.01	0.00	13.	2.	2.
8	0	0.01	0.01	0.00	7.	2.	2.
9	0	0.01	0.01	0.00	4.	2.	2.
10	0	0.01	0.01	0.00	2.	2.	2.
11	0	0.01	0.01	0.00	1.	2.	2.
12	0	0.01	0.01	0.00	1.	2.	2.
13	0	0.03	0.03	0.00		2.	2.
14	0	0.04	0.04	0.00		2.	2.
15	0	0.05	0.05	0.00		2.	2.
16	0	0.12	0.12	0.00		2.	2.
17	0	0.04	0.04	0.00		2.	2.
18	0	0.03	0.03	0.00		2.	2.
19	0	0.01	0.01	0.00		2.	2.
20	0	0.01	0.01	0.00		2.	2.
21	0	0.01	0.01	0.00		2.	2.
22	0	0.01	0.01	0.00		2.	2.
23	0	0.01	0.01	0.00		2.	2.
24	0	0.01	0.01	0.00		2.	2.
25	0	0.02	0.02	0.00		2.	2.
26	0	0.02	0.02	0.00		2.	2.
27	0	0.02	0.02	0.00		2.	2.
28	0	0.02	0.02	0.00		2.	2.
29	0	0.02	0.02	0.00		2.	2.
30	0	0.02	0.02	0.00		2.	2.
31	0	0.04	0.04	0.00		2.	2.
32	0	0.04	0.04	0.00		2.	2.
33	0	0.04	0.04	0.00		2.	2.
34	0	0.04	0.04	0.00		2.	2.
35	0	0.04	0.04	0.00		2.	2.
36	0	0.04	0.04	0.00		2.	2.
37	0	0.14	0.14	0.00		2.	2.
38	0	0.16	0.13	0.03		2.	3.
39	0	0.20	0.10	0.10		2.	10.
40	0	0.51	0.10	0.41		2.	36.
41	0	0.19	0.10	0.09		2.	73.
42	0	0.15	0.10	0.05		2.	82.
43	0	0.03	0.03	0.00		2.	62.
44	0	0.03	0.03	0.00		2.	38.
45	0	0.03	0.03	0.00		2.	22.
46	0	0.03	0.03	0.00		2.	12.
47	0	0.03	0.03	0.00		2.	8.
48	0	0.03	0.03	0.00		2.	5.
49	0	0.12	0.10	0.02		2.	5.
50	0	0.12	0.10	0.02		2.	6.

51	0	0.12	0.10	0.02		2.	9.
52	0	0.12	0.10	0.02		2.	10.
53	0	0.12	0.10	0.02		2.	11.
54	0	0.12	0.10	0.02		2.	11.
55	0	0.33	0.10	0.23		2.	20.
56	0	0.33	0.10	0.23		2.	47.
57	0	0.33	0.10	0.23		2.	76.
58	0	0.33	0.10	0.23		2.	94.
59	0	0.33	0.10	0.23		2.	104.
60	0	0.33	0.10	0.23		2.	109.
61	0	1.04	0.10	0.94		2.	141.
62	0	1.25	0.10	1.15		2.	240.
63	0	1.56	0.10	1.46		2.	379.
64	0	3.95	0.10	3.85		2.	609.
65	0	1.45	0.10	1.35		2.	896.
66	0	1.14	0.10	1.04		2.	958.
67	0	0.20	0.10	0.10		2.	767.
68	0	0.20	0.10	0.10		2.	514.
69	0	0.20	0.10	0.10		2.	308.
70	0	0.20	0.10	0.10		2.	187.
71	0	0.20	0.10	0.10		2.	124.
72	0	0.20	0.10	0.10		2.	91.
73	0	0.01	0.01	0.00		2.	69.
74	0	0.01	0.01	0.00		2.	47.
75	0	0.01	0.01	0.00		2.	28.
76	0	0.01	0.01	0.00		2.	14.
77	0	0.01	0.01	0.00		2.	8.
78	0	0.01	0.01	0.00		2.	5.
79	0	0.02	0.02	0.00		2.	4.
80	0	0.02	0.02	0.00		2.	3.
81	0	0.02	0.02	0.00		2.	2.
82	0	0.02	0.02	0.00		2.	2.
83	0	0.02	0.02	0.00		2.	2.
84	0	0.02	0.02	0.00		2.	2.
85	0	0.05	0.05	0.00		2.	2.
86	0	0.06	0.06	0.00		2.	2.
87	0	0.08	0.08	0.00		2.	2.
88	0	0.20	0.10	0.10		2.	6.
89	0	0.07	0.07	0.00		2.	14.
90	0	0.06	0.06	0.00		2.	16.
91	0	0.01	0.01	0.00		2.	11.
92	0	0.01	0.01	0.00		2.	7.
93	0	0.01	0.01	0.00		2.	4.
94	0	0.01	0.01	0.00		2.	3.
95	0	0.01	0.01	0.00		2.	3.
96	0	0.01	0.01	0.00		2.	2.
97	0					2.	2.
98	0					2.	2.
99	0					2.	2.
100	0					2.	2.
101	0					2.	2.
102	0					2.	2.
103	0					2.	2.
104	0					2.	2.
105	0					2.	2.
106	0					2.	2.
107	0					2.	2.
TOTAL		17.37	4.70	12.67	490.	214.	6423.

```
SELECT 1-6 (1=TIME INT,2=UNIT H,3=RAIN,4=RUNOFF,5=PNT,'6=STOP)        1
ENTER TIME INTERVAL(MIN)=    60.


SELECT 1-6 (1=TIME INT,2=UNIT H,3=RAIN,4=RUNOFF,5=PNT,'6=STOP)        2
ENTER DRAINAGE AREA (SQMI) =       0.75
SELECT 1-3 (1=INPUT UH, 2=CLARK, 3=SNYDER )        3
ENTER SNYDERS CP AND TP (HRS) =            0.62        1.16
ENTER INITIAL EST. CLARKS TO & (HRS) (0=DEFALLT)=   0.00        0.00

      TP        CP        TC        R

    1.01     0.454     1.33     0.67
    0.99     0.473     1.56     0.51
    1.02     0.512     1.77     0.50
    1.15     0.574     1.79     0.50
    1.16     0.581     1.79     0.50
    1.16     0.581     1.79     0.50
    1.16     0.581     1.79     0.50
    1.16     0.581     1.79     0.50
    1.16     0.581     1.79     0.50
    1.16     0.581     1.79     0.50
CP OR TP POSSIBLY NOT SATISFIED


SELECT 1-6 (1=TIME INT,2=UNIT H,3=RAIN,4=RUNOFF,5=PNT,'6=STOP)        3
ENTER RATIO  IMPERVIOUS =         0.00
SELECT 1-3 ( 1=RAIN, 2=SPS, 3=PMS )        2
ENTER SPS INDEX RAINFALL (IN) = 12.00
ENTER TRSPC AND TRSDA (SQMI) =             1.00        0.75
SELECT 1-3 (1=INIT+CONST, 2=ACUM LOSS, 3=SCS)        1
ENTER INITIAL LOSS(IN), CONSTANT LOSS(IN/HR) =       1.00        0.10


SELECT 1-6 (1=TIME INT,2=UNIT H,3=RAIN,4=RUNOFF,5=PNT,'6=STOP)        4
ENTER A TITLE PLEASE -   INDIAN SPF
ENTER STRTQ,QRCSN,AND RTIOR =         2.00     2.00     1.00

 HR MIN   RAIN   LOSS EXCESS   UNIT HG    RECSN     FLOW
  1   0   0.00   0.00   0.00      142.       2.        2.
  2   0   0.00   0.00   0.00      243.       2.        2.
  3   0   0.00   0.00   0.00      101.       2.        2.
  4   0   0.00   0.00   0.00        1.       2.        2.
  5   0   0.00   0.00   0.00                 2.        2.
  6   0   0.00   0.00   0.00                 2.        2.
  7   0   0.01   0.01   0.00                 2.        2.
  8   0   0.01   0.01   0.00                 2.        2.
  9   0   0.01   0.01   0.00                 2.        2.
 10   0   0.01   0.01   0.00                 2.        2.
 11   0   0.01   0.01   0.00                 2.        2.
 12   0   0.01   0.01   0.00                 2.        2.
 13   0   0.03   0.03   0.00                 2.        2.
 14   0   0.04   0.04   0.00                 2.        2.
 15   0   0.05   0.05   0.00                 2.        2.
 16   0   0.12   0.12   0.00                 2.        2.
 17   0   0.04   0.04   0.00                 2.        2.
 18   0   0.03   0.03   0.00                 2.        2.
 19   0   0.01   0.01   0.00                 2.        2.
 20   0   0.01   0.01   0.00                 2.        2.
 21   0   0.01   0.01   0.00                 2.        2.
 22   0   0.01   0.01   0.00                 2.        2.
 23   0   0.01   0.01   0.00                 2.        2.
 24   0   0.01   0.01   0.00                 2.        2.
 25   0   0.02   0.02   0.00                 2.        2.
```

26	0	0.02	0.02	0.00	2.	2.
27	0	0.02	0.02	0.00	2.	2.
28	0	0.02	0.02	0.00	2.	2.
29	0	0.02	0.02	0.00	2.	2.
30	0	0.02	0.02	0.00	2.	2.
31	0	0.04	0.04	0.00	2.	2.
32	0	0.04	0.04	0.00	2.	2.
33	0	0.04	0.04	0.00	2.	2.
34	0	0.04	0.04	0.00	2.	2.
35	0	0.04	0.04	0.00	2.	2.
36	0	0.04	0.04	0.00	2.	2.
37	0	0.14	0.14	0.00	2.	2.
38	0	0.16	0.13	0.03	2.	6.
39	0	0.20	0.10	0.10	2.	23.
40	0	0.51	0.10	0.41	2.	87.
41	0	0.19	0.10	0.09	2.	125.
42	0	0.15	0.10	0.05	2.	73.
43	0	0.03	0.03	0.00	2.	23.
44	0	0.03	0.03	0.00	2.	7.
45	0	0.03	0.03	0.00	2.	2.
46	0	0.03	0.03	0.00	2.	2.
47	0	0.03	0.03	0.00	2.	2.
48	0	0.03	0.03	0.00	2.	2.
49	0	0.12	0.10	0.02	2.	5.
50	0	0.12	0.10	0.02	2.	10.
51	0	0.12	0.10	0.02	2.	12.
52	0	0.12	0.10	0.02	2.	12.
53	0	0.12	0.10	0.02	2.	12.
54	0	0.12	0.10	0.02	2.	12.
55	0	0.33	0.10	0.23	2.	41.
56	0	0.33	0.10	0.23	2.	93.
57	0	0.33	0.10	0.23	2.	114.
58	0	0.33	0.10	0.23	2.	114.
59	0	0.33	0.10	0.23	2.	114.
60	0	0.33	0.10	0.23	2.	114.
61	0	1.04	0.10	0.94	2.	215.
62	0	1.25	0.10	1.15	2.	417.
63	0	1.56	0.10	1.46	2.	584.
64	0	3.95	0.10	3.85	2.	1019.
65	0	1.45	0.10	1.35	2.	1277.
66	0	1.14	0.10	1.04	2.	868.
67	0	0.20	0.10	0.10	2.	408.
68	0	0.20	0.10	0.10	2.	146.
69	0	0.20	0.10	0.10	2.	51.
70	0	0.20	0.10	0.10	2.	51.
71	0	0.20	0.10	0.10	2.	51.
72	0	0.20	0.10	0.10	2.	51.
73	0	0.01	0.01	0.00	2.	36.
74	0	0.01	0.01	0.00	2.	12.
75	0	0.01	0.01	0.00	2.	2.
76	0	0.01	0.01	0.00	2.	2.
77	0	0.01	0.01	0.00	2.	2.
78	0	0.01	0.01	0.00	2.	2.
79	0	0.02	0.02	0.00	2.	2.
80	0	0.02	0.02	0.00	2.	2.
81	0	0.02	0.02	0.00	2.	2.
82	0	0.02	0.02	0.00	2.	2.
83	0	0.02	0.02	0.00	2.	2.
84	0	0.02	0.02	0.00	2.	2.
85	0	0.05	0.05	0.00	2.	2.

86	0	0.06	0.06	0.00		2.	2.
87	0	0.08	0.08	0.00		2.	2.
88	0	0.20	0.10	0.10		2.	16.
89	0	0.07	0.07	0.00		2.	26.
90	0	0.06	0.06	0.00		2.	12.
91	0	0.01	0.01	0.00		2.	2.
92	0	0.01	0.01	0.00		2.	2.
93	0	0.01	0.01	0.00		2.	2.
94	0	0.01	0.01	0.00		2.	2.
95	0	0.01	0.01	0.00		2.	2.
96	0	0.01	0.01	0.00		2.	2.
97	0					2.	2.
98	0					2.	2.
99	0					2.	2.
TOTAL		17.37	4.70	12.67	487.	198.	6362.

```
SELECT 1-6 (1=TIME INT,2=UNIT H,3=RAIN,4=RUNOFF,5=PNT,'6=STOP)      1
ENTER TIME INTERVAL(MIN)=    6C.


SELECT 1-6 (1=TIME INT,2=UNIT H,3=RAIN,4=RUNOFF,5=PNT,'6=STOP)      2
ENTER DRAINAGE AREA (SQMI) =       0.75
SELECT 1-3 (1=INPUT UH, 2=CLARK, 3=SNYDER )        2
ENTER NUMBER OF TIME-AREA ORDINATES (0=NONE)=      C
ENTER CLARKS TC AND R (HRS) =         2.48        1.59

      TP        CP       TC        R

    1.98    0.568     2.48     1.59


SELECT 1-6 (1=TIME INT,2=UNIT H,3=RAIN,4=RUNOFF,5=PNT,'6=STOP)      3
ENTER RATIO  IMPERVIOUS =          C.00
SELECT 1-3 ( 1=RAIN, 2=SPS, 3=PMS )        3
ENTER PMS INDEX RAINFALL (IN) = 24.00
ENTER R6,R12,R24,R48,R72,R96 =     107.00  122.00  137.00  151.00  159.0
ENTER TRSPC AND TRSDA (SQMI) =              0.00        0.75
SELECT 1-3 (1=INIT+CONST, 2=ACUM LOSS, 3=SCS)        1
ENTER INITIAL LOSS(IN), CONSTANT LOSS(IN/HR) =       1.00        0.10


SELECT 1-6 (1=TIME INT,2=UNIT H,3=RAIN,4=RUNOFF,5=PNT,'6=STOP)      4
ENTER A TITLE PLEASE -   INDIAN PMF
ENTER STRTQ,QRCSN,AND RTIOR =         2.00     2.00     1.00

 HR MIN   RAIN   LOSS EXCESS  UNIT HG    RECSN     FLOW
  1   0   C.02   0.02   0.00      42.       2.        2.
  2   0   C.02   0.02   0.00     124.       2.        2.
  3   0   C.02   0.02   0.00     139.       2.        2.
  4   0   0.02   0.02   0.00      87.       2.        2.
  5   0   C.02   0.02   0.00      46.       2.        2.
  6   0   C.02   0.02   0.00      24.       2.        2.
  7   0   C.04   0.04   0.00      13.       2.        2.
  8   0   0.04   0.04   0.00       7.       2.        2.
  9   0   C.04   0.04   0.00       4.       2.        2.
 10   0   0.04   0.04   0.00       2.       2.        2.
 11   0   C.04   0.04   0.00       1.       2.        2.
 12   0   0.04   0.04   0.00       1.       2.        2.
 13   0   C.18   0.18   0.00                2.        2.
 14   0   0.22   0.22   0.00                2.        2.
 15   0   C.27   0.25   0.02                2.        3.
 16   0   0.68   0.10   0.58                2.       29.
 17   0   C.25   0.10   C.15                2.       83.
 18   0   0.20   0.10   0.10                2.      107.
 19   0   0.03   0.03   0.00                2.       87.
 20   0   0.03   0.03   0.00                2.       56.
 21   0   C.03   0.03   0.00                2.       32.
 22   0   0.03   0.03   0.00                2.       18.
 23   0   0.03   0.03   0.00                2.       10.
 24   0   0.03   0.03   0.00                2.        7.
 25   0   0.16   0.10   0.06                2.        7.
```

26	0	0.16	0.10	0.06		2.	14.
27	0	0.16	0.10	0.06		2.	21.
28	0	0.16	0.10	0.06		2.	26.
29	0	0.16	0.10	0.06		2.	28.
30	0	0.16	0.10	0.06		2.	30.
31	0	0.41	0.10	0.31		2.	41.
32	0	0.41	0.10	0.31		2.	73.
33	0	0.41	0.10	0.31		2.	108.
34	0	0.41	0.10	0.31		2.	129.
35	0	0.41	0.10	0.31		2.	141.
36	0	0.41	0.10	0.31		2.	147.
37	0	1.76	0.10	1.66		2.	207.
38	0	2.11	0.10	2.01		2.	391.
39	0	2.63	0.10	2.53		2.	646.
40	0	6.67	0.10	6.57		2.	1046.
41	0	2.46	0.10	2.36		2.	1537.
42	0	1.93	0.10	1.83		2.	1647.
43	0	0.25	0.10	0.15		2.	1324.
44	0	0.25	0.10	0.15		2.	886.
45	0	0.25	0.10	0.15		2.	525.
46	0	0.25	0.10	0.15		2.	314.
47	0	0.25	0.10	0.15		2.	204.
48	0	0.25	0.10	0.15		2.	146.
49	0	0.01	0.01	0.00		2.	109.
50	0	0.01	0.01	0.00		2.	73.
51	0	0.01	0.01	0.00		2.	43.
52	0	0.01	0.01	0.00		2.	21.
53	0	0.01	0.01	0.00		2.	11.
54	0	0.01	0.01	0.00		2.	6.
55	0	0.02	0.02	0.00		2.	4.
56	0	0.02	0.02	0.00		2.	3.
57	0	0.02	0.02	0.00		2.	3.
58	0	0.02	0.02	0.00		2.	2.
59	0	0.02	0.02	0.00		2.	2.
60	0	0.02	0.02	0.00		2.	2.
61	0	0.10	0.10	0.00		2.	2.
62	0	0.12	0.10	0.02		2.	3.
63	0	0.15	0.10	0.05		2.	7.
64	0	0.39	0.10	0.29		2.	23.
65	0	0.14	0.10	0.04		2.	48.
66	0	0.11	0.10	0.01		2.	53.
67	0	0.01	0.01	0.00		2.	37.
68	0	0.01	0.01	0.00		2.	22.
69	0	0.01	0.01	0.00		2.	12.
70	0	0.01	0.01	0.00		2.	8.
71	0	0.01	0.01	0.00		2.	5.
72	0	0.01	0.01	0.00		2.	4.
73	0					2.	3.
74	0					2.	3.
75	0					2.	2.
76	0					2.	2.
77	0					2.	2.
78	0					2.	2.
79	0					2.	2.
80	0					2.	2.
81	0					2.	2.
82	0					2.	2.
83	0					2.	2.
TOTAL		26.07	4.73	21.34	490.	166.	10623.

```
SELECT 1-6 (1=TIME INT,2=UNIT H,3=RAIN,4=RUNOFF,5=PNT,'6=STOP)      1
ENTER TIME INTERVAL(MIN)=    60.


SELECT 1-6 (1=TIME INT,2=UNIT H,3=RAIN,4=RUNOFF,5=PNT,'6=STOP)      2
ENTER DRAINAGE AREA (SQMI) =      0.75
SELECT 1-3 (1=INPUT UH, 2=CLARK, 3=SNYDER )       3
ENTER SNYDERS CP AND TP (HRS) =          0.62       1.16
ENTER INITIAL EST. CLARKS TO & (HRS) (0=DEFAULT)=  0.00       0.00

      TP       CP       TC       R

    1.01    0.454     1.33     0.67
    0.99    0.473     1.56     0.51
    1.02    0.512     1.77     0.50
    1.15    0.574     1.79     0.50
    1.16    0.581     1.79     0.50
    1.16    0.581     1.79     0.50
    1.16    0.581     1.79     0.50
    1.16    0.581     1.79     0.50
    1.16    0.581     1.79     0.50
    1.16    0.581     1.79     0.50
CP OR TP POSSIBLY NOT SATISFIED


SELECT 1-6 (1=TIME INT,2=UNIT H,3=RAIN,4=RUNOFF,5=PNT,'6=STOP)      3
ENTER RATIO  IMPERVIOUS =        0.00
SELECT 1-3 ( 1=RAIN, 2=SPS, 3=PMS )       3
ENTER PMS INDEX RAINFALL (IN) = 24.00
ENTER R6,R12,R24,R48,R72,R96 =     107.00  122.00  137.00  151.00  159.00
ENTER TRSPC AND TRSDA (SQMI) =           0.00       0.75
SELECT 1-3 (1=INIT+CONST, 2=ACUM LOSS, 3=SCS)       1
ENTER INITIAL LOSS(IN), CONSTANT LOSS(IN/HR) =      1.00       0.10


SELECT 1-6 (1=TIME INT,2=UNIT H,3=RAIN,4=RUNOFF,5=PNT,'6=STOP)      4
ENTER A TITLE PLEASE -   INDIAN PMF
ENTER STRTQ,QRCSN,AND RTIOR =        2.00     2.00     1.00

 HR MIN   RAIN   LOSS EXCESS  UNIT HG    RECSN     FLOW
  1   0   0.02   0.02   0.00     142.       2.        2.
  2   0   0.02   0.02   0.00     243.       2.        2.
  3   0   0.02   0.02   0.00     101.       2.        2.
  4   0   0.02   0.02   0.00       1.       2.        2.
  5   0   0.02   0.02   0.00                2.        2.
  6   0   0.02   0.02   0.00                2.        2.
  7   0   0.04   0.04   0.00                2.        2.
  8   0   0.04   0.04   0.00                2.        2.
  9   0   0.04   0.04   0.00                2.        2.
 10   0   0.04   0.04   0.00                2.        2.
 11   0   0.04   0.04   0.00                2.        2.
 12   0   0.04   0.04   0.00                2.        2.
 13   0   0.18   0.18   0.00                2.        2.
 14   0   0.22   0.22   0.00                2.        2.
 15   0   0.27   0.25   0.02                2.        5.
```

16	0	0.68	0.10	0.58		2.	89.
17	0	0.25	0.10	0.15		2.	166.
18	0	0.20	0.10	0.10		2.	111.
19	0	0.03	0.03	0.00		2.	42.
20	0	0.03	0.03	0.00		2.	12.
21	0	0.03	0.03	0.00		2.	2.
22	0	0.03	0.03	0.00		2.	2.
23	0	0.03	0.03	0.00		2.	2.
24	0	0.03	0.03	0.00		2.	2.
25	0	0.16	0.10	0.06		2.	11.
26	0	0.16	0.10	0.06		2.	25.
27	0	0.16	0.10	0.06		2.	31.
28	0	0.16	0.10	0.06		2.	31.
29	0	0.16	0.10	0.06		2.	31.
30	0	0.16	0.10	0.06		2.	31.
31	0	0.41	0.10	0.31		2.	67.
32	0	0.41	0.10	0.31		2.	127.
33	0	0.41	0.10	0.31		2.	153.
34	0	0.41	0.10	0.31		2.	153.
35	0	0.41	0.10	0.31		2.	153.
36	0	0.41	0.10	0.31		2.	153.
37	0	1.76	0.10	1.66		2.	344.
38	0	2.11	0.10	2.01		2.	722.
39	0	2.63	0.10	2.53		2.	1017.
40	0	6.67	0.10	6.57		2.	1752.
41	0	2.46	0.10	2.36		2.	2190.
42	0	1.93	0.10	1.83		2.	1502.
43	0	0.25	0.10	0.15		2.	710.
44	0	0.25	0.10	0.15		2.	246.
45	0	0.25	0.10	0.15		2.	76.
46	0	0.25	0.10	0.15		2.	75.
47	0	0.25	0.10	0.15		2.	75.
48	0	0.25	0.10	0.15		2.	75.
49	0	0.01	0.01	0.00		2.	54.
50	0	0.01	0.01	0.00		2.	17.
51	0	0.01	0.01	0.00		2.	2.
52	0	0.01	0.01	0.00		2.	2.
53	0	0.01	0.01	0.00		2.	2.
54	0	0.01	0.01	0.00		2.	2.
55	0	0.02	0.02	0.00		2.	2.
56	0	0.02	0.02	0.00		2.	2.
57	0	0.02	0.02	0.00		2.	2.
58	0	0.02	0.02	0.00		2.	2.
59	0	0.02	0.02	0.00		2.	2.
60	0	0.02	0.02	0.00		2.	2.
61	0	0.10	0.10	0.00		2.	2.
62	0	0.12	0.10	0.02		2.	5.
63	0	0.15	0.10	0.05		2.	14.
64	0	0.39	0.10	0.29		2.	57.
65	0	0.14	0.10	0.04		2.	83.
66	0	0.11	0.10	0.01		2.	43.
67	0	0.01	0.01	0.00		2.	9.
68	0	0.01	0.01	0.00		2.	3.
69	0	0.01	0.01	0.00		2.	2.
70	0	0.01	0.01	0.00		2.	2.
71	0	0.01	0.01	0.00		2.	2.
72	0	0.01	0.01	0.00		2.	2.
73	0					2.	2.
74	0					2.	2.
75	0					2.	2.
TOTAL		26.07	4.73	21.34	487.	150.	10533.

DESIGN BRIEF

DESIGNED BY NFO DATE 8.11.78

CHECKED BY PAGE C-15 OF

PROJECT NO. SHORT TITLE

DESIGN SUBJECT REF. DWGS.

Discharge Over Spillway Crest flashboard in place

$H_d = 3.0$

	H	Elevation	C_w	L	$H^{3/2}$	Q
	0	189.86				0
	1	190.86	3.40	34.5	1	117
Top of Dam	2	191.86	3.55		2.8	343
	3	192.86	3.70		5.2	664
	4	193.86	3.70		8.0	102[illegible]
	5	194.86	3.70		11.2	1430
	6	195.86	4.00	↓	14.7	202[illegible]

Discharge Over Spillway Crest - Flashboard removed.

	H_1	H_2	Elevation	C_{w1}	C_{w2}		L_{w2}	$H_1^{3/2}$	$H_2^{3/2}$	Q_1	Q_2	Q_T
	0		186.86								0	0
	1		187.86	3.40			[illegible]6	1		[illegible]1		31
	2		188.86	3.55				2.8		[illegible]1		91
	3	0	189.86	3.70				5.2		[illegible]6		176
	4	1	190.86	3.70	3.40		25.44	8.0	1	[illegible]1	89	360
Top of Dam	5	2	191.86	3.70	3.55			11.[illegible]	2.8	[illegible]3	254	634
	6	3	192.86	4.00	3.70			14.7	5.2	5[illegible]9	491	1030
	7	4	193.86	4.00	3.70			19.5	8.[illegible]	678	756	1434
	8	5	194.86	4.00	3.70			22.6	11.[illegible]	82[illegible]	1058	1886
	9	6	195.86	4.00	4.00		✓	27.0	14.7	[illegible]9	1502	2041

DESIGN BRIEF

DESIGNED BY NFO DATE 8.11.78

CHECKED BY PAGE C-16 OF

PROJECT NO. SHORT TITLE

DESIGN SUBJECT Toledo Pool REF. DWGS.

Discharge Over Dam

H	Elevation	C	L	H^3/2	Q
0	191.86	2.68	500	0	0
1	192.86	↓	↓	1	1340
2	193.86			2.8	3750
3	194.86			5.2	6968
4	195.86	↓	↓	8.0	10720

Summary

Desc	Elev	w/ Flashboards			w/o Flashboards		
		Q spill	Q dam	Q tot	Q spill	Q dam	Q tot
	186.86		—	—	0	—	0
	187		—	—	31	—	31
	188		—	—	91	—	91
	189		—	—	176	—	176
	190	117	—	117	360	—	360
Toledo	191	343	—	343	634	—	634
	194	664	1340	2004	1030	1340	2370
	193	1021	3750	4771	1434	3750	5184
	194	1430	6968	8398	1886	6968	8854
	195	2029	10720	12749	2041	10720	12761

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EC-1 VERSION DATED JAN 1973
PDATED AUG 74
HANGE NO. 01
****

INDIAN BROOK DAM
RESERVOIR ROUTING OVER STRUCTURE OF SPF
INCLUDES SERVICE SPILLWAY WITHOUT FLASHBOARDS

JOB SPECIFICATION

NQ	NHR	NMIN	IDAY	IHR	IMIN	METRC	IPLT	IPRT	NSTAN
23	3	0	0	0	0	0	0	0	0

JOPER	NWT
3	0

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SUB-AREA RUNOFF COMPUTATION

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
0	0	0	0	0	0	0

HYDROGRAPH DATA

IHYDG	IUNG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
-1	0	0.75	0.0	0.0	0.0	0.0	0	0	0

INPUT HYDROGRAPH

11.	20.	47.	76.	94.	104.	109.	141.	240.	379.
609.	896.	958.	767.	514.	308.	187.	124.	91.	69.
47.	28.	14.							

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	958.	927.	584.	254.	5833.
INCHES		11.47	28.89	36.00	36.00
AC-FT		460.	1159.	1447.	1447.

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HYDROGRAPH ROUTING

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
0	1	0	0	0	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME
0.0	0.0	0.0	1	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA
1	0	0	0.0	0.0	0.0	-1.

STORAGE	0.	15.	30.	45.	60.	75.	90.	105.	120.	135.
OUTFLOW	0.	31.	91.	176.	313.	503.	2116.	4794.	8350.	12485.

TIME	EOP STOR	AVG IN	EOP OUT
1	5.	11.	11.
2	6.	16.	13.
3	10.	34.	21.
4	18.	62.	42.
5	25.	85.	70.
6	30.	99.	89.
7	32.	107.	103.
8	35.	125.	121.
9	45.	191.	179.
10	60.	310.	318.
11	75.	494.	549.
12	79.	753.	928.
13	79.	927.	926.
14	78.	863.	808.
15	75.	641.	499.
16	66.	411.	392.
17	51.	248.	228.
18	42.	156.	157.
19	34.	108.	116.
20	29.	80.	87.
21	24.	58.	68.
22	19.	38.	48.
23	15.	21.	30.
SUM			5803.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	928.	927.	581.	252.	5803.
INCHES		11.47	28.74	35.89	35.89
AC-FT		460.	1153.	1440.	1440.

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RUNOFF SUMMARY, AVERAGE FLOW

		PEAK	6-HOUR	24-HOUR	72-HOUR	AREA
HYDROGRAPH AT	0	958.	927.	584.	254.	0.75
ROUTED TO	0	928.	927.	581.	252.	0.75

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EC-1 VERSION DATED JAN 1973
PDATED AUG 74
HANGE NO. 01
****

INDIAN BROOK DAM
RESERVOIR ROUTING OVER STRUCTURE OF PMF
INCLUDES SERVICE SPILLWAY WITH FLASHBOARDS

JOB SPECIFICATION

NQ	NHR	NMIN	IDAY	IHR	IMIN	METRC	IPLT	IPRT	NSTAN
23	3	0	0	0	0	0	0	0	0

JOPER	NWT
3	0

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SUB-AREA RUNOFF COMPUTATION

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
0	0	0	0	0	0	0

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
-1	0	0.75	0.0	0.0	0.0	0.0	0	0	0

INPUT HYDROGRAPH

30.	41.	73.	108.	129.	141.	147.	207.	391.	646.
1046.	1537.	1647.	1324.	886.	525.	314.	204.	146.	109.
73.	43.	21.							

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1647.	1592.	1000.	426.	9788.
INCHES		19.69	49.49	60.54	60.54
AC-FT		790.	1985.	2428.	2428.

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HYDROGRAPH ROUTING

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
0	1	0	0	0	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME
0.0	0.0	0.0	1	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA
1	0	0	0.0	0.0	0.0	-1.

STORAGE	0.	15.	30.	45.	60.	75.	90.	0.	0.	0.
OUTFLOW	0.	73.	214.	1754.	4386.	7859.	11985.	0.	0.	0.

TIME	EOP STOR	AVG IN	EOP OUT
1	6.	30.	30.
2	7.	36.	34.
3	11.	57.	51.
4	16.	91.	84.
5	20.	119.	121.
6	22.	135.	136.
7	23.	144.	145.
8	26.	177.	179.
9	32.	299.	376.
10	34.	519.	640.
11	38.	846.	1022.
12	43.	1292.	1522.
13	44.	1592.	1652.
14	41.	1486.	1343.
15	37.	1105.	901.
16	33.	786.	538.
17	31.	420.	318.
18	30.	259.	211.
19	26.	175.	172.
20	20.	128.	124.
21	17.	91.	88.
22	13.	58.	61.
23	8.	32.	39.
SUM			9789.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1652.	1587.	999.	426.	9789.
INCHES		19.63	49.45	60.55	60.55
AC-FT		787.	1983.	2428.	2428.

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RUNOFF SUMMARY, AVERAGE FLOW

		PEAK	6-HOUR	24-HOUR	72-HOUR	AREA
HYDROGRAPH AT	0	1647.	1592.	1000.	426.	0.75
ROUTED TO	0	1652.	1587.	999.	426.	0.75

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EC-1 VERSION DATED JAN 1973
PDATED AUG 74
HANGE NO. 01
****

INDIAN BROOK DAM
RESERVOIR ROUTING OVER STRUCTURE OF SPF
INCLUDES SERVICE SPILLWAY WITH FLASHBOARDS

JOB SPECIFICATION

NQ	NMR	NMIN	IDAY	IHR	IMIN	METRC	IPLT	IPRT	NSTAN
23	3	0	0	0	0	0	0	0	0

JOPER	NWT
3	0

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SUB-AREA RUNOFF COMPUTATION

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
0	0	0	0	0	0	0

HYDROGRAPH DATA

IHYDG	IUNG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
-1	0	0.75	0.0	0.0	0.0	0.0	0	0	0

INPUT HYDROGRAPH

11.	20.	47.	76.	94.	104.	109.	141.	240.	379.
609.	896.	958.	767.	514.	308.	187.	124.	91.	69.
47.	28.	14.							

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	958.	927.	584.	254.	5833.
INCHES		11.47	28.89	36.08	36.08
AC-FT		460.	1159.	1447.	1447.

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HYDROGRAPH ROUTING

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
0	1	0	0	0	0	0

ROUTING DATA

QLOSS	CLOSS	AVC	IRES	ISAME
0.0	0.0	0.0	1	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA
1	0	0	0.0	0.0	0.0	-1.

STORAGE#	0.	15.	30.	45.	60.	75.	90.	0.	0.	0.
OUTFLOW#	0.	73.	214.	1754.	4386.	7859.	11985.	0.	0.	0.

TIME	EOP STOR	AVG IN	EOP OUT
1	2.	11.	11.
2	3.	16.	14.
3	6.	34.	29.
4	11.	62.	53.
5	16.	85.	79.
6	18.	99.	101.
7	19.	107.	107.
8	21.	125.	126.
9	28.	191.	195.
10	32.	310.	394.
11	34.	494.	580.
12	37.	753.	900.
13	37.	927.	950.
14	36.	863.	788.
15	33.	641.	515.
16	31.	411.	322.
17	28.	248.	196.
18	23.	156.	152.
19	18.	108.	104.
20	16.	80.	78.
21	13.	58.	61.
22	9.	38.	43.
23	5.	21.	27.
SUM			5826.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	950.	925.	581.	253.	5826.
INCHES		11.44	28.73	36.04	36.04
AC-FT		459.	1152.	1445.	1445.

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RUNOFF SUMMARY, AVERAGE FLOW

		PEAK	6-HOUR	24-HOUR	72-HOUR	AREA
HYDROGRAPH AT	0	958.	927.	584.	254.	0.75
ROUTED TO	0	950.	925.	581.	253.	0.75

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EC-1 VERSION DATED JAN 1973
PDATED AUG 74
HANGE NO. 01
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INDIAN BROOK DAM
RESERVOIR ROUTING OVER STRUCTURE OF PMF
INCLUDES SERVICE SPILLWAY WITHOUT FLASHBOARDS

JOB SPECIFICATION

NQ	NHR	NMIN	IDAY	IHR	IMIN	METRC	IPLT	IPRT	NSTAN
23	3	0	0	0	0	0	0	0	0

JOPER	NWT
3	0

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SUB-AREA RUNOFF COMPUTATION

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
0	0	0	0	0	0	0

HYDROGRAPH DATA

IHYDC	IUNC	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
-1	0	0.75	0.0	0.0	0.0	0.0	0	0	0

INPUT HYDROGRAPH

30.	41.	73.	108.	129.	141.	147.	207.	391.	646.
1046.	1537.	1647.	1324.	886.	525.	314.	204.	146.	109.
73.	43.	21.							

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1647.	1592.	1000.	426.	9788.
INCHES		19.69	49.49	60.54	60.54
AC-FT		790.	1985.	2428.	2428.

********** ********** ********** ********** **********

HYDROGRAPH ROUTING

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
0	1	0	0	0	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME
0.0	0.0	0.0	1	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA
1	0	0	0.0	0.0	0.0	-1.

STORAGE#	0.	15.	30.	45.	60.	75.	90.	105.	120.	135.
OUTFLOW#	0.	31.	91.	176.	313.	503.	2116.	4794.	8350.	12485.

TIME	EOP STOR	AVG IN	EOP OUT
1	15.	30.	30.
2	16.	36.	33.
3	19.	57.	49.
4	26.	91.	76.
5	33.	119.	108.
6	37.	135.	130.
7	39.	144.	142.
8	44.	177.	171.
9	59.	299.	305.
10	76.	519.	597.
11	89.	846.	1060.
12	84.	1292.	1490.
13	86.	1592.	1679.
14	83.	1486.	1319.
15	79.	1105.	921.
16	75.	786.	520.
17	66.	420.	391.
18	52.	259.	241.
19	44.	175.	172.
20	38.	128.	135.
21	31.	91.	99.
22	25.	58.	70.
23	18.	32.	45.
SUM			9784.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1679.	1585.	997.	425.	9784.
INCHES		19.61	49.35	60.51	60.51
AC-FT		786.	1979.	2427.	2427.

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RUNOFF SUMMARY, AVERAGE FLOW

		PEAK	6-HOUR	24-HOUR	72-HOUR	AREA
HYDROGRAPH AT	0	1647.	1592.	1000.	426.	0.75
ROUTED TO	0	1679.	1585.	997.	425.	0.75

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@OLD MY32001
@LNHFF
@0100 A  INDIAN BROOK DAM
@110 A  RESERVOIR ROUTING OVER STRUCTURE OF SPF
@120 A  INCLUDES SERVICE SPILLWAY WITH FLASHBOARDS
@130 B     23       3
@140 1      3
@150 K      0
@160 M     -1          0.7520
@170 N     11      20      47      76      94     104     109     141     240     379
@180 N    609     896     958     767     514     308     187     124      91      69
@190 N     47      28      14
@200 K      1
@210 Y                              1
@220 1      1                                                   -1
@230 2      0      15      30      45      60      75      90
@240 3      0     117     343    2004    4771    8398   12749
@250 K     99
@260 A
@270 A
@280 A
@290 A
@300 A
@SAVE
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@OLD MY32002
@LNHFF
@0100 A  INDIAN BROOK DAM
@110 A  RESERVOIR ROUTING OVER STRUCTURE OF SPF
@120 A  INCLUDES SERVICE SPILLWAY WITHOUT FLASHBOARDS
@130 B     23       3
@140 1      3
@150 K      0
@160 M     -1          0.7520
@170 N     11      20      47      76      94     104     109     141     240     379
@180 N    609     896     958     767     514     308     187     124      91      69
@190 N     47      28      14
@200 K      1
@210 Y                              1
@220 1      1                                                   -1
@230 2      0      15      30      45      60      75      90     105     120     135
@240 3      0      31      91     176     360     634    2370    5184    8854   12761
@250 K     99
@260 A
@270 A
@280 A
@290 A
@300 A
@SAVE
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EC-1 VERSION DATED JAN 1973
PDATED AUG 74
HANGE NO. 01
****

INDIAN BROOK DAM
RESERVOIR ROUTING OVER STRUCTURE OF SPF
INCLUDES SERVICE SPILLWAY WITHOUT FLASHBOARDS

JOB SPECIFICATION

NQ	NHR	NMIN	IDAY	IHR	IMIN	METRC	IPLT	IPRT	NSTAN
23	3	0	0	0	0	0	0	0	0

JOPER	NWT
3	0

********** ********** ********** ********** **********

SUB-AREA RUNOFF COMPUTATION

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
0	0	0	0	0	0	0

HYDROGRAPH DATA

IHYDG	IUNG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
-1	0	0.75	0.0	0.0	0.0	0.0	0	0	0

INPUT HYDROGRAPH

11.	20.	47.	76.	94.	104.	109.	141.	240.	379.
609.	896.	958.	767.	514.	308.	187.	124.	91.	69.
47.	28.	14.							

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	958.	927.	584.	254.	5833.
INCHES		11.47	28.89	36.08	36.08
AC-FT		460.	1159.	1447.	1447.

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HYDROGRAPH ROUTING

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
0	1	0	0	0	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME
0.0	0.0	0.0	1	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA
1	0	0	0.0	0.0	0.0	-1.

STORAGE	0.	15.	30.	45.	60.	75.	90.	105.	120.	135.
OUTFLOW	0.	31.	91.	176.	360.	634.	2370.	5184.	8854.	12761.

TIME	EOP STOR	AVG IN	EOP OUT
1	5.	11.	11.
2	6.	16.	13.
3	10.	34.	21.
4	18.	62.	42.
5	25.	85.	70.
6	30.	99.	89.
7	32.	107.	103.
8	35.	125.	121.
9	45.	191.	179.
10	58.	310.	336.
11	70.	494.	552.
12	77.	753.	899.
13	78.	927.	952.
14	76.	863.	785.
15	70.	641.	546.
16	60.	411.	359.
17	49.	248.	224.
18	41.	156.	152.
19	34.	108.	115.
20	29.	80.	87.
21	24.	58.	68.
22	19.	38.	48.
23	15.	21.	30.
SUM			5803.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	952.	925.	582.	252.	5803.
INCHES		11.44	28.77	35.89	35.89
AC-FT		459.	1154.	1440.	1440.

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RUNOFF SUMMARY, AVERAGE FLOW

		PEAK	6-HOUR	24-HOUR	72-HOUR	AREA
HYDROGRAPH AT	0	958.	927.	584.	254.	0.75
ROUTED TO	0	952.	925.	582.	252.	0.75

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HEC-1 VERSION DATED JAN 1973
PDATED AUG 74
HANGE NO. 01
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INDIAN BROOK DAM
RESERVOIR ROUTING OVER STRUCTURE OF SPF
INCLUDES SERVICE SPILLWAY WITH FLASHBOARDS

JOB SPECIFICATION

NQ	NHR	NMIN	IDAY	IHR	IMIN	METRC	IPLT	IPRT	NSTAN
23	3	0	0	0	0	0	0	0	0

JOPER	NWT
3	0

********** ********** ********** ********** **********

SUB-AREA RUNOFF COMPUTATION

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
0	0	0	0	0	0	0

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
-1	0	0.75	0.0	0.0	0.0	0.0	0	0	0

INPUT HYDROGRAPH

11.	20.	47.	76.	94.	104.	109.	141.	240.	379.
609.	896.	958.	767.	514.	308.	187.	124.	91.	69.
47.	28.	14.							

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	958.	927.	584.	254.	5833.
INCHES		11.47	28.89	36.08	36.08
AC-FT		460.	1159.	1447.	1447.

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HYDROGRAPH ROUTING

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
0	1	0	0	0	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME
0.0	0.0	0.0	1	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA
1	0	0	0.0	0.0	0.0	-1.

STORAGE	0.	15.	30.	45.	60.	75.	90.	0.	0.	0.
OUTFLOW	0.	117.	343.	2004.	4771.	8398.	12749.	0.	0.	0.

TIME	EOP STOR	AVG IN	EOP OUT
1	1.	11.	11.
2	2.	16.	15.
3	4.	34.	33.
4	8.	62.	61.
5	11.	85.	85.
6	13.	99.	99.
7	14.	107.	106.
8	16.	125.	127.
9	21.	191.	210.
10	30.	310.	340.
11	33.	494.	626.
12	35.	753.	862.
13	36.	927.	983.
14	34.	863.	758.
15	32.	641.	539.
16	28.	411.	313.
17	22.	248.	228.
18	16.	156.	134.
19	13.	108.	104.
20	10.	80.	80.
21	7.	58.	58.
22	5.	38.	38.
23	3.	21.	21.
SUM			5831.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	983.	923.	581.	254.	5831.
INCHES		11.41	28.75	36.07	36.07
AC-FT		458.	1153.	1447.	1447.

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RUNOFF SUMMARY, AVERAGE FLOW

		PEAK	6-HOUR	24-HOUR	72-HOUR	AREA
HYDROGRAPH AT	0	958.	927.	584.	254.	0.75
ROUTED TO	0	983.	923.	581.	254.	0.75

```
#OLD NY338P1
#LNHFF
@0100 A  INDIAN BROOK DAM
@110 A  RESERVOIR ROUTING OVER STRUCTURE OF PMF
@120 A  INCLUDES SERVICE SPILLWAY WITH FLASHBOARDS
@130 B     23       3
@140 I      3
@150 K      0
@160 M     -1          0.7520
@170 N     30      41      73     108     129     141     147     207     391     646
@180 N   1046    1537    1647    1324     886     525     314     204     146     109
@190 N     73      43      21
@200 K      1
@210 Y                              1
@220 I      1                                                   -1
@230 Z      0      15      30      45      60      75      90
@240 3      0     117     343    2004    4771    8398   12749
@250 K     99
@260 A
@270 A
@280 A
@290 A
@300 A
#SAVE
#OLD NY338P2
#LNHFF
@0100 A  INDIAN BROOK DAM
@110 A  RESERVOIR ROUTING OVER STRUCTURE OF PMF
@120 A  INCLUDES SERVICE SPILLWAY WITHOUT FLASHBOARDS
@130 B     23       3
@140 I      3
@150 K      0
@160 M     -1          0.7520
@170 N     30      41      73     108     129     141     147     207     391     646
@180 N   1046    1537    1647    1324     886     525     314     204     146     109
@190 N     73      43      21
@200 K      1
@210 Y                              1
@220 I      1                                                   -1
@230 Z      0      15      30      45      60      75      90     105     120     135
@240 3      0      31      91     176     360     634    2370    5184    8854   12761
@250 K     99
@260 A
@270 A
@280 A
@290 A
@300 A
#SAVE
```

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EC-1 VERSION DATED JAN 1973
PDATED AUG 74
HANGE NO. 01
****

INDIAN BROOK DAM
RESERVOIR ROUTING OVER STRUCTURE OF PMF
INCLUDES SERVICE SPILLWAY WITHOUT FLASHBOARDS

JOB SPECIFICATION

NQ	NMR	NMIN	IDAY	IHR	IMIN	METRC	IPLT	IPRT	MSTAN
23	3	0	0	0	0	0	0	0	0

JOPER	NWT
3	0

********** ********** ********** ********** **********

SUB-AREA RUNOFF COMPUTATION

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
0	0	0	0	0	0	0

HYDROGRAPH DATA

IHYDG	IUNG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
-1	0	0.75	0.0	0.0	0.0	0.0	0	0	0

INPUT HYDROGRAPH

30.	41.	73.	108.	129.	141.	147.	207.	391.	646.
1046.	1537.	1647.	1324.	886.	525.	314.	204.	146.	109.
73.	43.	21.							

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1647.	1592.	1000.	426.	9788.
INCHES		19.69	49.49	60.54	60.54
AC-FT		790.	1985.	2428.	2428.

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HYDROGRAPH ROUTING

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
0	1	0	0	0	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME
0.0	0.0	0.0	1	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA
1	0	0	0.0	0.0	0.0	-1.

STORAGE	0.	15.	30.	45.	60.	75.	90.	105.	120.	135.
OUTFLOW	0.	31.	91.	176.	360.	634.	2370.	5184.	8854.	12761.

TIME	EOP STOR	AVG IN	EOP OUT
1	15.	30.	30.
2	16.	36.	33.
3	19.	57.	49.
4	26.	91.	76.
5	33.	119.	108.
6	37.	135.	130.
7	39.	144.	142.
8	44.	177.	171.
9	57.	299.	323.
10	73.	519.	589.
11	79.	846.	1054.
12	82.	1292.	1498.
13	84.	1592.	1674.
14	81.	1486.	1322.
15	77.	1105.	916.
16	70.	706.	551.
17	60.	420.	369.
18	50.	259.	235.
19	43.	175.	167.
20	38.	128.	134.
21	31.	91.	99.
22	25.	58.	70.
23	18.	32.	45.
SUM			9784.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1674.	1586.	997.	425.	9784.
INCHES		19.62	49.31	60.51	60.51
AC-FT		787.	1978.	2427.	2427.

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RUNOFF SUMMARY, AVERAGE FLOW

		PEAK	6-HOUR	24-HOUR	72-HOUR	AREA
HYDROGRAPH AT	0	1647.	1592.	1000.	426.	0.75
ROUTED TO	0	1674.	1586.	997.	425.	0.75

****
EC-1 VERSION DATED JAN 1973
PDATED AUG 74
HANGE NO. 01
****

INDIAN BROOK DAM
RESERVOIR ROUTING OVER STRUCTURE OF PMF
INCLUDES SERVICE SPILLWAY WITH FLASHBOARDS

JOB SPECIFICATION

NQ	NHR	NMIN	IDAY	IHR	IMIN	METRC	IPLT	IPRT	NSTAN
23	3	0	0	0	0	0	0	0	0

JOPER	NWT
3	0

********** ********** ********** ********** **********

SUB-AREA RUNOFF COMPUTATION

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
0	0	0	0	0	0	0

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
-1	0	0.75	0.0	0.0	0.0	0.0	0	0	0

INPUT HYDROGRAPH

30.	41.	73.	108.	129.	141.	147.	207.	391.	646.
1046.	1537.	1647.	1324.	886.	525.	314.	204.	146.	109.
73.	43.	21.							

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1647.	1592.	1000.	426.	9788.
INCHES		19.69	49.49	60.54	60.54
AC-FT		790.	1985.	2428.	2428.

********** ********** ********** ********** **********

HYDROGRAPH ROUTING

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
0	1	0	0	0	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME
0.0	0.0	0.0	1	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA
1	0	0	0.0	0.0	0.0	-1.

STORAGE#	0.	15.	30.	45.	60.	75.	90.	0.	0.	0
OUTFLOW#	0.	117.	343.	2004.	4771.	8398.	12749.	0.	0.	0.

TIME	EOP STOR	AVG IN	EOP OUT
1	4.	30.	30.
2	5.	36.	35.
3	7.	57.	57.
4	12.	91.	90.
5	15.	119.	118.
6	17.	135.	140.
7	17.	144.	145.
8	20.	177.	187.
9	29.	299.	333.
10	33.	519.	674.
11	36.	846.	994.
12	41.	1292.	1548.
13	42.	1592.	1630.
14	39.	1486.	1361.
15	35.	1105.	884.
16	32.	706.	551.
17	28.	420.	317.
18	23.	259.	242.
19	18.	175.	155.
20	15.	128.	119.
21	12.	91.	91.
22	8.	58.	59.
23	4.	32.	32.
SUM			9792.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1630.	1589.	997.	426.	9792.
INCHES		19.66	49.33	60.57	60.57
AC-FT		788.	1979.	2429.	2429.

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RUNOFF SUMMARY, AVERAGE FLOW

		PEAK	6-HOUR	24-HOUR	72-HOUR	AREA
HYDROGRAPH AT	0	1647.	1592.	1000.	426.	0.75
ROUTED TO	0	1630.	1589.	997.	426.	0.75

APPENDIX D

REFERENCES

APPENDIX D

REFERENCES

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REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
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19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Dam Safety
National Dam Safety Program
Visual Inspection
Hydrology, Structural Stability
Westchester County
Indian Brook Reservoir Dam
Indian Brook River

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

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.

Indian Brook Reservoir Dam was judged to be unsafe, non-emergency due to a seriously inadequate spillway.

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