

AD-A146 104

NATIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS
COMMODORE FOODS COMPA..(U) CORPS OF ENGINEERS WALTHAM
MA NEW ENGLAND DIV MAY 79

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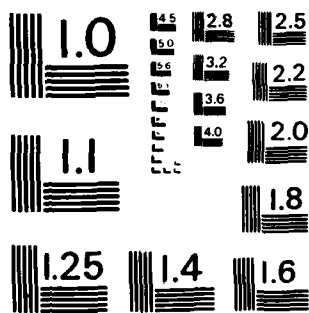
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MIDDLESEX COUNTY
WESTFORD, MASSACHUSETTS

AD-A146 104

COMMODORE FOODS COMPANY DAM
MA-00131

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NATIONAL DAM INSPECTION PROGRAM
CORPS OF ENGINEERS

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER MA 00131	2. GOVT ACCESSION NO. A146104	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) Commodore Foods Company Dam NATIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS		5. TYPE OF REPORT & PERIOD COVERED INSPECTION REPORT
7. AUTHOR(s) U.S. ARMY CORPS OF ENGINEERS NEW ENGLAND DIVISION		6. PERFORMING ORG. REPORT NUMBER
9. PERFORMING ORGANIZATION NAME AND ADDRESS		8. CONTRACT OR GRANT NUMBER(s)
11. CONTROLLING OFFICE NAME AND ADDRESS DEPT. OF THE ARMY, CORPS OF ENGINEERS NEW ENGLAND DIVISION, NEDED 424 TRAPELO ROAD, WALTHAM, MA. 02254		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		12. REPORT DATE May 1979
		13. NUMBER OF PAGES 40
		15. SECURITY CLASS. (of this report) UNCLASSIFIED
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
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17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES Cover program reads: Phase I Inspection Report, National Dam Inspection Program; however, the official title of the program is: National Program for Inspection of Non-Federal Dams; use cover date for date of report.		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) DAMS, INSPECTION, DAM SAFETY, Middlesex County Westford, Mass.		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) It has been found to have a "low" hazard potential. The Commodore Foods Company Dam is of stone masonry construction, approximately 76.5 ft. in length and 16 ft. in height, with a 40 ft. wide overflow spillway. The peak failure outflow is estimated to be 3,300 cfs.		

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24 May 1979
File No. 4270

New England Division
U.S. Army Corps of Engineers
424 Trapelo Road
Waltham, MA 02154

Attention: Mr. E.P. Gould, Project Manager

Subject: National Dam Inspection Program
Contract No. DACW33-79-C-0018, Item 4

Gentlemen:

The Commodore Foods Company Dam, Identification No. MA 00131, has been found to have a "low" hazard potential, as a result of the site visit conducted on 8 March 1979. This finding was brought to the attention of your Mr. Gary James of Project Management on 12 March 1979. At his request, this brief letter report documenting the "low" hazard potential classification of the dam is submitted in lieu of a complete Phase I Investigation report.

The dam is located across Stony Brook, adjacent to a Commodore Foods Company building in Westford, Massachusetts, Middlesex County, as shown on the Location Map, page A-1. A copy of the most recent available state inspection report, dated 9 October 1973, is included herein, page B-1. The Commodore Foods Company Dam is of stone masonry construction, approximately 76.5 ft. in length and 16 ft. in height, with a 40 ft. wide overflow spillway. Former outlet works gates and a pipe to the left and right of the spillway are no longer operative.

A "Site Sketch Plan", page C-1, shows the general configuration of the project and the direction of view of six photographs taken of the dam, Brookside Road Bridge and Stony Brook on 8 March 1979, pages C-2 through C-4. Measurements made at the dam site on the same day are given on pages D-1 and D-2.

New England Division

U.S. Army Corps of Engineers -2-

24 May 1979

Based on Corps of Engineers Guidelines for Estimating Dam Failure Hydrographs, and assuming that a failure would occur along 40 percent of the length of the dam structure, the peak failure outflow is estimated to be 3,300 cfs. The downstream channel capacity, as shown in the attached computations, page D-3 and D-4, is more than adequate for this flow, and no flooding of the channel banks is expected to occur. A preliminary flood impact analysis of the effect on a pond located about 1,500 ft. downstream of the Brookside Road Bridge shows that the maximum increase in water surface level of the pond following entry of the failure flood waters would be about 3 ft. No dwellings are expected to be flooded as a result of the dam failure.

Therefore, it is considered that the hazard potential at the Commodore Food Company Dam site is low. Because of this finding, the Phase I assessment of the condition of the dam was not completed.

Very truly yours,
HALEY & ALDRICH, INC.

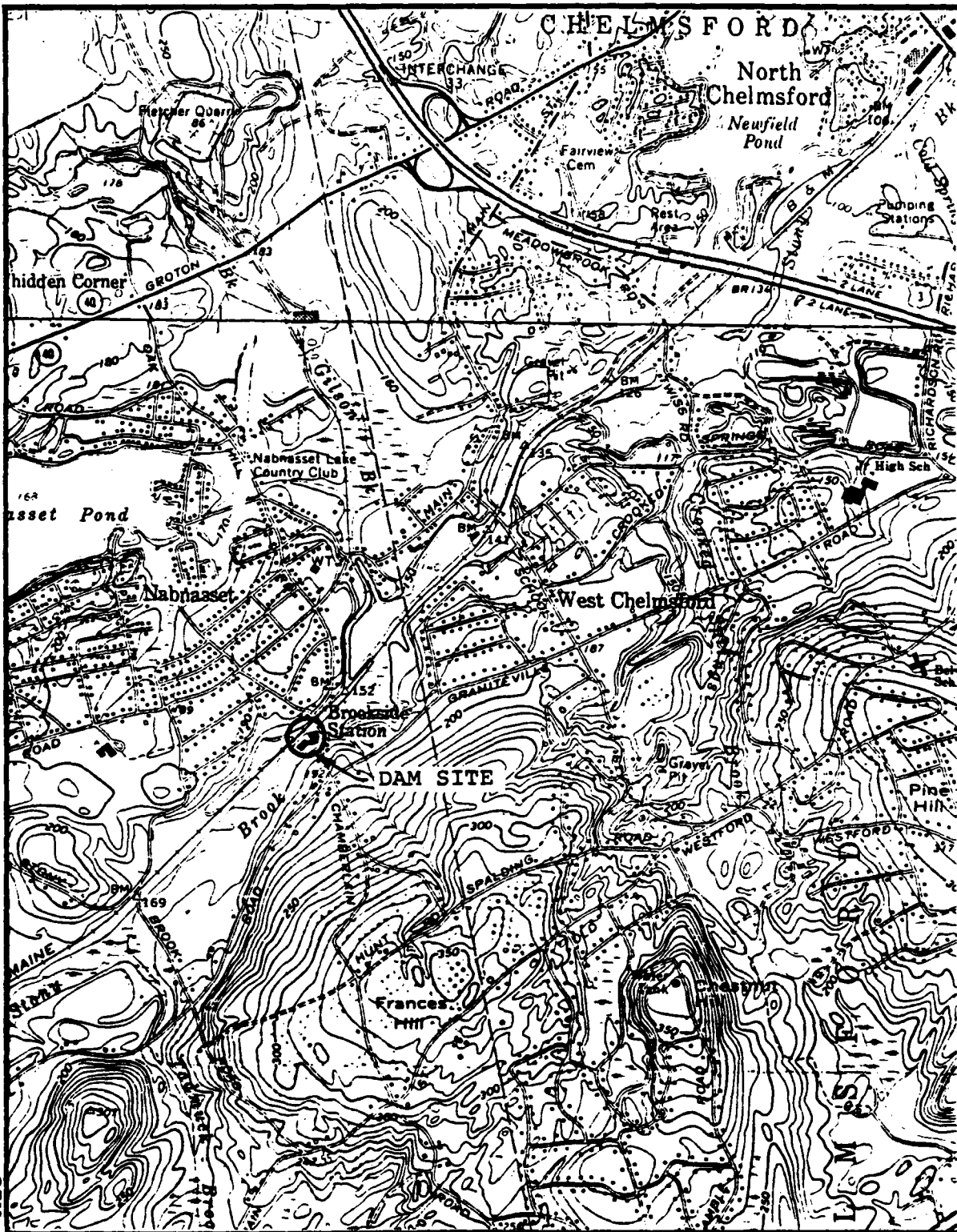
P. L. LeCount
Peter L. LeCount
Vice President

PLL/bms
Enclosures

Accession For	
NTIS GRA&I	☒
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Unannounced	☐
Justification	
By _____	
Distribution/	
Availability Codes	
Dist	Avail and/or Special
A-1	



FILE NO. 4270 A25



DAM: COMMODORE FOODS CO.
IDENTIFICATION NO. MA 00131

LOCATION MAP
USGS QUADRANGLE

WESTFORD, MA
APPROX. SCALE: 1" = 2000'

January 15, 1974

Stuart Haywood, Plant Manager
Commodore Foods Company
645 Lawrence Street
Lowell, Massachusetts 01850

Re: Inspection-Dam A-9-330-2
Westford
Commodore Foods Co. Dam

Dear Mr. Haywood:

An engineer from the Massachusetts Department of Public Works has inspected the above dam, owned by the Commodore Foods Company.

The inspection was made in accordance with Chapter 253 of the Massachusetts General Laws, as amended by Chapter 595 of the Acts of 1970.

The results of the inspection indicate that this dam is safe; however, the following conditions were noted that require attention:

1. The controls for the five foot drain pipes are broken and need to be repaired or replaced as necessary.
2. Remove the growth from the joints of the masonry wall and repoint as needed.
3. Replace the missing masonry stones.

We call these conditions to your attention now before they become serious and more expensive to correct.

Very truly yours,

Fred C. Schwell
FRED. C. SCHWELM
Deputy Chief Engineer

LJA
LEA:DMY
CC: C.F. Mistrretta
L. McCalla

INSPECTION REPORT - DAMS AND RESERVOIRS

(1.) Location: City/Town WESTFORD

Dam No. 4-9-330-2

Name of Dam COMMODORE FOODS CO DAM

Inspected by A. Z. PIZANO

Date of Inspection 10-9-'73

(2) Owners:

per:

Assessed ☒

Prev. Inspection

Reg. of Deeds

Reg. Contact

COMMODORE FOODS CO. 645 LAWRENCE ST. LOWELL, MASS 01850 (459-2551)

Name COMMODORE FOODS CO. St. & No. 645 LAWRENCE ST. City/Town LOWELL State MASS Tel. No. 459-2551

2. Name HEARN St. & No. City/Town State Tel. No.

3. Name St. & No. City/Town State Tel. No.

(3) Caretaker: (if any) e.g. superintendent, plant manager, appointed by absentee owner, appointed by multiple owners.

STU. HEYWOOD, PLANT MGR, COMMODORE FOODS CO. 459-2551
Name STU. HEYWOOD St. & No. City/Town State Tel. No.

(4) No. of Pictures taken 3

(5) Degree of Hazard: (if dam should fail completely)*

1. Minor

2. Moderate ☒

3. Severe

4. Disastrous

*This rating may change as land use changes (future development)

(6) Outlet Control: Automatic ☒

Manual

Operative No.

☒ No.

Comments: THE ~~CONTROLS~~ CONTROLS FOR THE 5' EMERGENCY

DRAIN PIPES ARE BROKEN, AND HAVE NOT BEEN REPAIRED.

THE PIPE VALVES SHOULD BE REPAIRED (SEE NO. 12)

(7) Spillway: Name of Dam: Location:

Good ☒

Minor Repairs

Major Repairs

Complete Repairs

-2-

(8) Downstream Face of Dam: Condition: 1. Good ☒ ^{DAM NO. 4-4-590-2} 2. Minor Repairs ☐
3. Major Repairs ☐ 4. Urgent Repairs ☐

Comments: _____

(9) Emergency Spillway: Conditions: 1. Good ☐ 2. Minor Repairs ☐
3. Major Repairs ☒ 4. Urgent Repairs ☐
Comments: - SEE NO. 6 -

(10) Water level @ time of inspection _____ ft. above 0.5' below _____
top of dam ☒ Principal spillway _____
other _____

(11) Summary of Deficiencies Noted:

Growth (Trees and Brush) on Embankment ☒ (SEE PICTURES)
Animal Burrows and Washouts _____
Damage to slopes or top of dam _____
Cracked or Damaged Masonry _____
Evidence of Seepage _____
Evidence of Piping _____
Erosion _____
Leaks _____
Trash and debris impeding flow _____
Clogged or blocked spillway ☒
Other _____

(12) Remarks & Recommendations: (Fully Explain)

URGENT REPAIRS ARE NEEDED TO OPEN THE 5' DIAMETER
PIPES, SO THAT HOMES DO NOT HAVE WATER IN CELLARS, UPSTREAM,
WHEN WATER RISES TO HIGHER THAN DESIGNED ELEVATION.
THE ~~CONTROL~~ CONTROL IS RATCHET OPERATED.

(13) Overall Conditions:

1. Safe ☒
2. Minor repairs needed ☒
3. Conditionally safe - major repairs needed
4. Unsafe
5. Reservoir impoundment no longer exists (explain):
Recommend removal from operation list

DESCRIPTION OF DAM
DISTRICT #4

Submitted by FRANCIS H. PAREX ADAM 2 PIZAN
Date 10-4-73

Dam No. 4-9-370-2
City/Town WESTFORD
Name of Dam COMMODORE FOODS
DAM

1. Location: Topo Sheet No. 25C
Provide 8 1/2" x 11" in clear copy of topo map with location of Dam
Clearly indicate
2. Year built: UNKNOWN Year/s of subsequent repairs UNKNOWN
3. Purpose of Dam: Water Supply _____, Recreational L
Irrigation _____, Other _____
4. Drainage Area: 3.5 SQ. MI. 2,250 ACRES.
5. Normal Ponding Area: 75 acres; Ave Depth 4'
Impoundment: 100 MIL. gals; 300 acre ft.
6. No. and type of dwellings located adjacent to pond or reservoir
i.e. summer homes etc. _____
7. Dimensions of Dam: Length 25' Max. Height 5' DEPTH 2 DAM
Slopes: Upstream Face WEST
Downstream Face WEST
Width across top 5'
8. Classifications of Dam by Materials:
Earth _____, Conc. Masonary L, Stone Masonary L
Timber _____, Rockfill _____, Other _____
9. A. Description of present land usage downstream of dam: FO 5 rural;
10 % urban
B. Is there a storage area or flood plain downstream of dam: which could
accommodate the impoundment in the event of a complete dam failure
no L yes _____

DAM NO. 4-9-330-2

Risk to life and property in event of complete failure.

No. of buildings

No. of homes

No. of businesses

BUSINESS, COMMODORE FOODS CO. ADJ. TO DAM

No. of utilities

NONE

Railroads

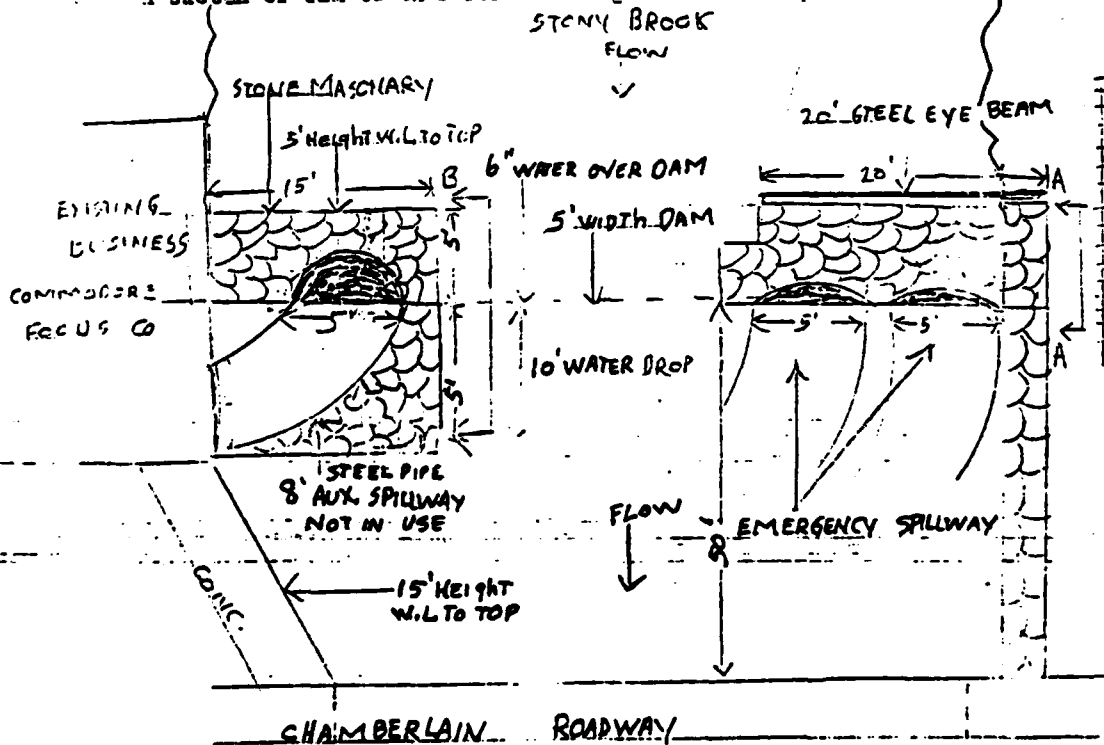
OPERATING, ADJ. TO PLANT

Other dams

NONE

Other

Sketch of dam to this form showing section and plan 8 1/2" x 11" sheet.



DAM NO. 4-9-330-2

20.

Risk to life and property in event of complete failure.

No. of houses

No. of homes

No. of businesses

No. of industries

No. of utilities

Railroads

Other dams

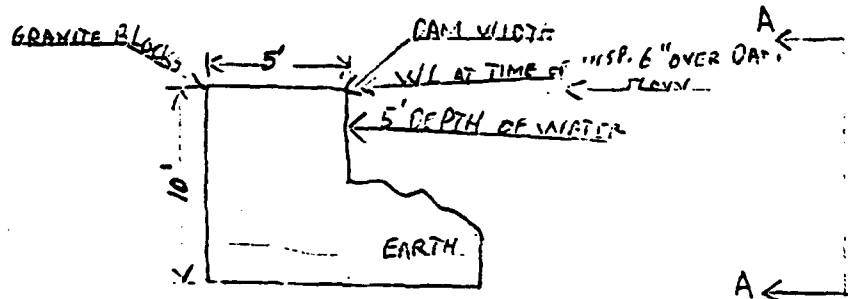
Other

1 OPERATING ADJ. TO PLANT B&M

NONE

21.

Sketch sketch of dam to this form showing section and plan 8 1/2" x 11" Sheet.



X-SECTION A

SKETCH NOT TO SCALE

FILE NO. 4270 A36

NOTE

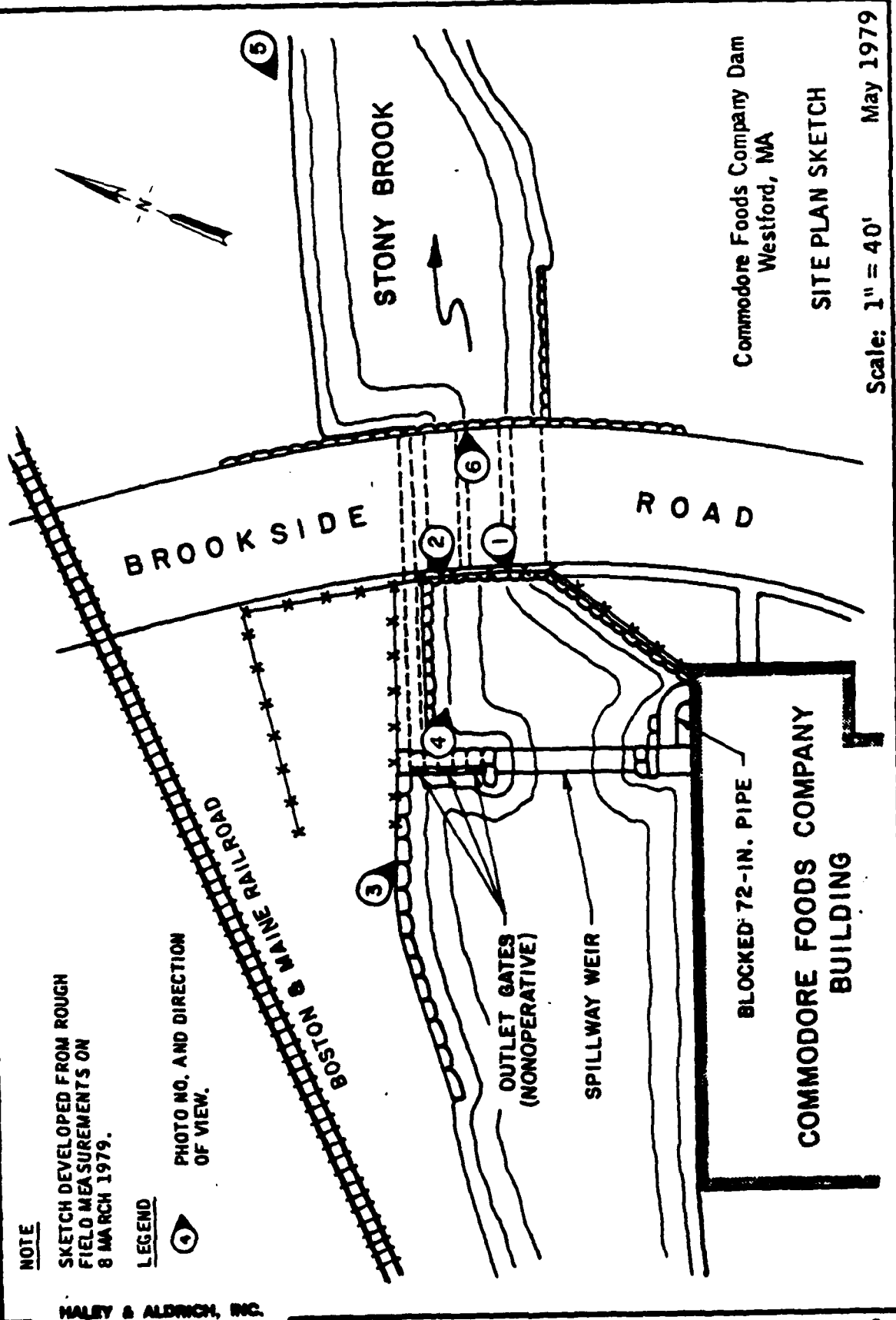
SKETCH DEVELOPED FROM ROUGH
FIELD MEASUREMENTS ON
8 MARCH 1979.

LEGEND



PHOTO NO. AND DIRECTION
OF VIEW.

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS



Commodore Foods Company Dam
Westford, MA

SITE PLAN SKETCH

Scale: 1" = 40' May 1979



1. Overview of Commodore Foods Company Dam and Stony Brook upstream of dam



2. Left side of dam, showing two inoperative 48-in. diameter outlets



3. Stems of three inoperative gates left of spillway



4. Upstream side of Brookside Road Bridge



5. Downstream side of Brookside Road Bridge



6. Stony Brook channel downstream of Brookside Road

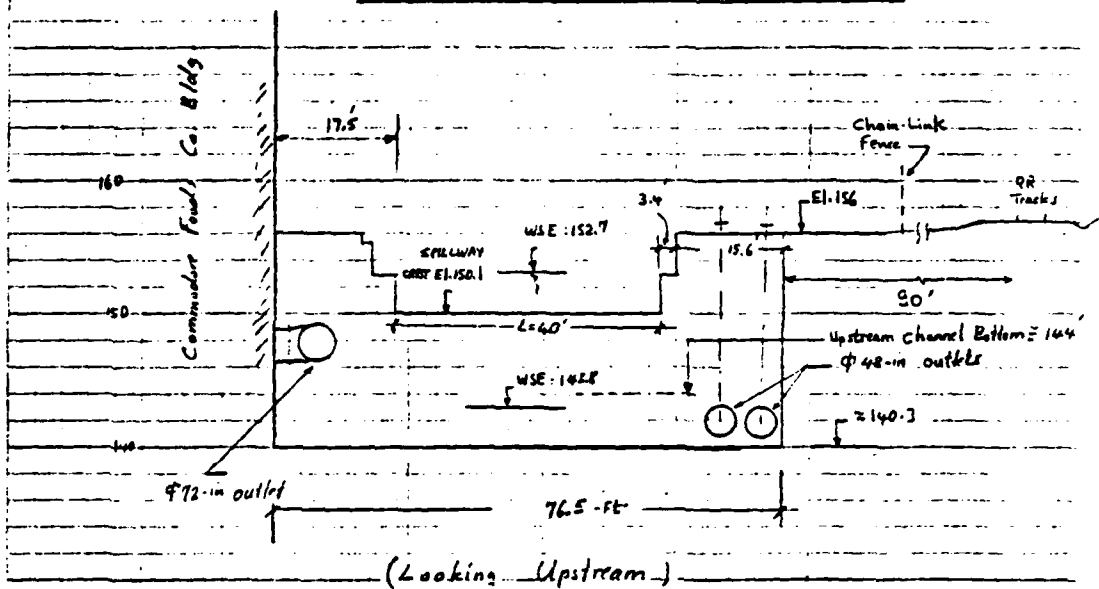
CAMP DRESSER & MCKEE
Environmental Engineers
Boston, Mass.

CLIENT H&A
PROJECT COE Dam Inspection
DETAIL Commodore Ford's Co. Dam

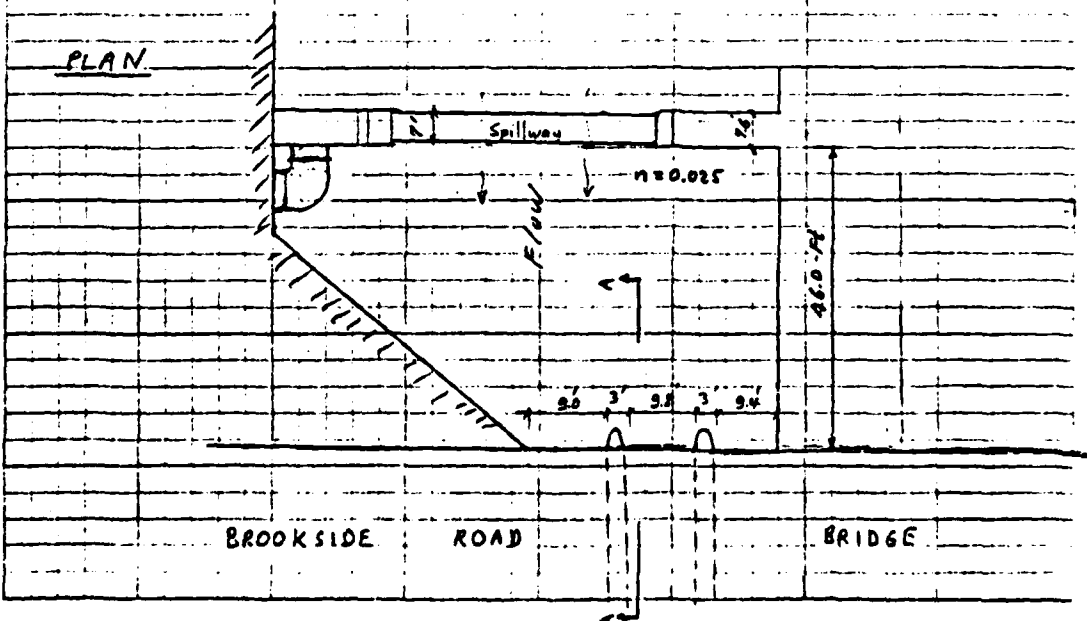
JOB NO 561-9 Pt-4
DATE CHECKED 5/17/
CHECKED BY

PAGE 3
DATE 3/22/70
COMPUTED BY PHL

SPILLWAY & DAM - FRONT ELEVATION

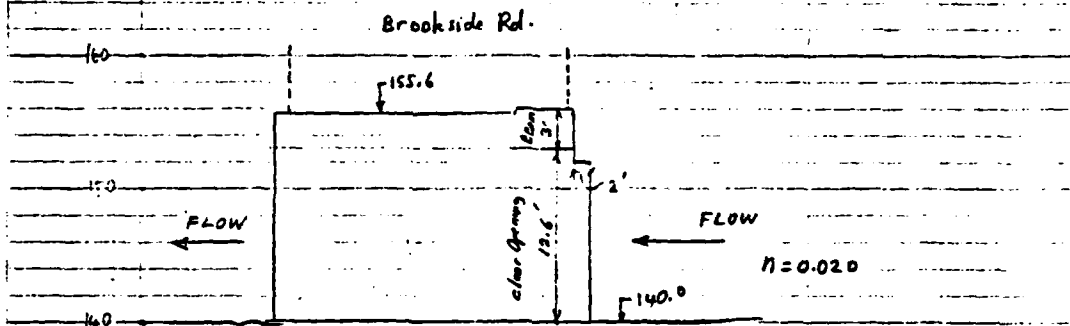


PLAN

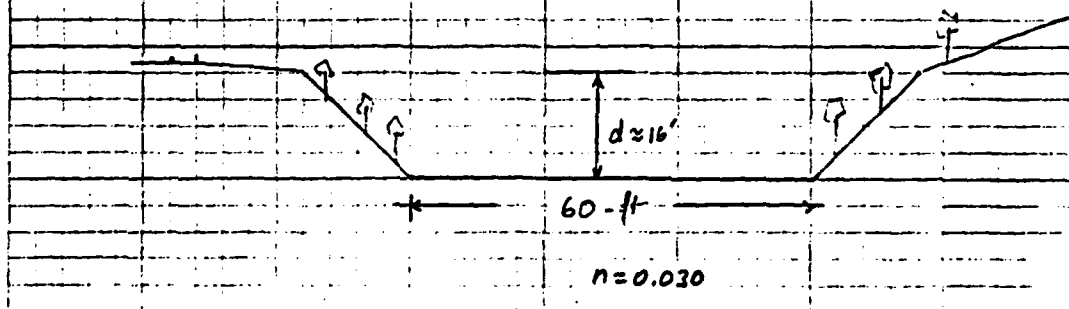


CAMP DRESSER & MCKEE CLIENT HWA JOB NO 561-9-Rt-4 PAGE 4
 Environmental Engineers PROJECT C&E Dam Inspection DATE CHECKED _____ DATE 3/22/79
 Boston, Mass. DETAIL Cambridge Falls Co. Dam CHECKED BY _____ COMPUTED BY BHC

SECTION A-A @ BRIDGE



DOWNSTREAM CHANNEL SECTION : Below the Bridge



Size Classification

Storage Volume: Normally no ponding exists behind the dam. (No ponding is shown upstream of the Commodore Foods Company dam on USGS map). The pond shown on the left bank, upstream of the dam, has no connection to Stony Brook; the WSE in Stony Brook, during the inspection, was about 4.2 feet lower than the level in the pond. The storage volume at the top of the dam was estimated from the USGS as follows:

$$V = \frac{3000 \text{ ft} \times 300 \text{ ft} \times 12 \text{ ft}}{43,560} = 124 \text{ ac-ft} < 1000 \text{ ac-ft}$$

Dam Height: $H = 156.0 - 140.3 = 15.7 \approx 16 \text{ ft} < 40 \text{ ft}$.

SIZE: SMALL

Hazard Potential: requires checking of downstream channel hydraulics for the dam failure flood:

$$Q_p = \frac{8}{27} \times 0.4 \times 76.5 \times 5.67 \times 16^{3/2} = 3,300 \text{ cfs}$$

Channel Reach upstream of the bridge on Brookside Road:

$$\text{Channel Capacity: } A = 10 \times 76.5 = 765 \text{ ft}^2 \quad R^{2/3} = 3.98 \quad n = 0.025$$

$$(see page 3) \quad S = 0.005 \quad Q_{max} = \frac{1.49}{0.025} \times 765 \times 3.98 \times 0.07 = 12,700 \text{ cfs}$$

Capacity of the Bridge openings: 3 - 9.5 x 12.6 (h) openings
(See pages 3 & 4)

$$A = 9.5 \times 12 = 114 \text{ ft}^2 \quad R^{2/3} = 2.28 \quad n = 0.02$$

$$S = 0.005 \quad \sqrt{S} = 0.07 \quad Q = \frac{1.49}{0.02} \times 114 \times 2.26 \times 0.07 \approx 1,350 \text{ cfs}$$

$$\Sigma Q = 3 \times 1,350 = 4,050 \text{ cfs}$$

CAMP DRESSER & MCKEE
Environmental Engineers
Boston, Mass.

CLIENT H & A
PROJECT COE Dam Inspection
DETAIL Commodore Frode Co. Dam

JOB NO 561-S-H-4
DATE CHECKED 5/17/79
CHECKED BY RHS

PAGE 2
DATE 3/21/79
COMPUTED BY AKG

Downstream channel below the bridge: (See page 4)

Flow Capacity: $A = 16 \times \frac{60+90}{2} = 1,200 \text{ ft}^2$ $n = 0.03$
 $R^{2/3} = 5.1$ $S = \frac{143.3-140}{1500} = 0.0022$

$Q = \frac{1.49}{0.03} 1200 \cdot 5.1 \cdot 0.047 = 14,250 \text{ cfs}$

Flow capacity of the downstream channel and the bridge is more than the failure flood flow of 3300 cfs, therefore no overtopping of the stream banks is expected.

Failure Flood Impact in the Pond between Brookline and West Chelmsford:

Normal Pond Area $\approx 21 \text{ acres} + 10.3 \text{ acres} = 31.3 \text{ acres}$

Channel storage during the failure flood: $80 \cdot \frac{16+8}{2} \cdot 1500 \cdot \frac{1}{43,560} = 33 \text{ ac-ft}$

Storage Volume above the dam: 124 ac-ft @ E1. 156.0 (top of Dam)

Net Flow into the downstream Pond: $124 - 33 = 91 \text{ ac-ft}$

Assuming no outflow from the downstream pond:

$h_w = \frac{91}{31.3} = 2.9 \text{ ft}$ WSE in the downstream pond would rise by about 3.0 feet to E1. 143.0

With exception of one plant building on the right bank near the outlet of the downstream pond, no dwellings can be seen below 150 contour on USGS map.

Conclusion: Hazard Potential is LOW

END

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