

BOARD OF SUPERVISORS

EAST GOSHEN TOWNSHIP

CHESTER COUNTY

1580 PAOLI PIKE, WEST CHESTER, PA 19380-6199

FILE

March 31, 2015

Mr. Steve Kepler
PA Fish and Boat Commission
Division of Environmental Services
450 Robinson Lane
Bellefonte, PA 16823

Re: Milltown Dam
DEP ID No. D-15-146

Dear Mr. Kepler

The PA DEP has advised East Goshen Township that the above referenced dam does not meet current overtopping requirements. Accordingly, the Township must either armor or breach the dam.

We met with PA DEP at the dam on March 11, 2015 and developed a possible course of action which the Township Engineer summarized in his March 30, 2015 memo. Under this course of action the removal of the dam would be conducted in phases, which would reduce the cost.

If you have any questions or need additional information please contact me at 610-692-7171 or by e-mail at rsmith@eastgoshen.org.

Sincerely,



Louis F. Smjth, Jr.
Township Manager

Cc: John Hohenstein, PA DEP



APPLICATION TO DRAW OFF WATER FROM IMPOUNDMENTS

Submit one copy of the completed application to the Pennsylvania Fish and Boat Commission, Division of Environmental Services, 450 Robinson Lane, Bellefonte, PA 16823 Telephone (814) 359-5180.

This application will be reviewed jointly by the Pennsylvania Fish and Boat Commission (PFBC) and the Department of Environmental Protection (DEP) Bureau of Waterways Engineering, and if acceptable, a permit will be issued under the PFBC Fishing and Boating Regulations, 58 Pa. Code, §51.81.

| General Information | |
|---|---|
| 1. Name of Applicant (owner or lessee): EAST GOSHEN TOWNSHIP Is the applicant: <input checked="" type="checkbox"/> owner <input type="checkbox"/> lessee If not owner, provide owner name: (Note: If owner is not dam permittee, Transfer of Dam Permit is required; Please call 717-787-8568 to obtain Transfer of Dam Permit Forms.) | Telephone Number: 610-692-7171 Fax Number: 610-692-8950 E-Mail address of owner: RSMITH@EASTGOSHEN.ORG |
| 2. Contractor/consultant name if conducting drawdown for permittee: | Contractor telephone: NA Contractor E-Mail: |
| 3. Address of Applicant: 1580 PAOLI PIKE | |
| 4. Name of Impoundment: MILL TOWN RESERVOIR | DEP ID. No. D15-146 |
| 5. County Location: ATTACH A MAP (USGS topo map, PennDOT County Highway or equivalent map of a suitable scale to locate your impoundment) | Municipality: Check one: <input type="checkbox"/> City <input type="checkbox"/> Borough <input checked="" type="checkbox"/> Township |
| 5. Type of Impoundment (Check) <input type="checkbox"/> Natural or <input checked="" type="checkbox"/> Man-made | |
| 6. Name of receiving stream: (If unnamed, indicate "unnamed tributary to _____ Creek") CHESTER CREEK | |
| 7. Is the impoundment open to public fishing? (check) <input checked="" type="checkbox"/> Yes or <input type="checkbox"/> No | |
| 8. Does the impoundment contain fish or other aquatic organisms? (check) <input checked="" type="checkbox"/> Yes or <input type="checkbox"/> No | |

| Specific draw down information | | |
|---|---------------------------------------|---|
| 9. Proposed dates of draw down | From: SPRING 2015 | To: SUMMER 2017 |
| 10. Impoundment area (acres): 12 ACRES | Maximum depth (feet): 16 FT | Depth of drawdown: (feet below normal pool) 16 FT |
| 11. Drawdown method - (check) <input checked="" type="checkbox"/> Valve <input type="checkbox"/> Gate <input type="checkbox"/> Stoplog <input type="checkbox"/> Siphon <input type="checkbox"/> Pump <input type="checkbox"/> Other (specify) _____ | | |
| 12. If fish are to be transferred, state: A. Destination water: B. Method of transfer: | | |

| 13. Purpose of drawdown | | | |
|---|-------------------------------------|---|--------------------------|
| A. Construction, maintenance or elimination (check) | | B. Construction or maintenance (check) | |
| *1. Dam or spillway repairs | <input type="checkbox"/> | 8. Ice damage prevention or control | <input type="checkbox"/> |
| *2. Dam, Spillway, or outfall structure repair/modification | <input type="checkbox"/> | 9. Install fish habitat structure or cover | <input type="checkbox"/> |
| *3. Dredging - Indicate number of acres: _____ | <input type="checkbox"/> | 10. Other (explain) | <input type="checkbox"/> |
| *4. Pond elimination and backfill | <input checked="" type="checkbox"/> | C. Fish or other aquatic life management (check) | |
| *5. Construction or maint. of shoreline structures | <input type="checkbox"/> | 11. Eliminate unwanted fish species | <input type="checkbox"/> |
| *6. Beach renovation | <input type="checkbox"/> | 12. Permit predation on overabundant forage species | <input type="checkbox"/> |
| *7. Dock Construction or Maintenance | <input type="checkbox"/> | 13. Aquatic vegetation control | <input type="checkbox"/> |
| *IMPORTANT: Complete DEP Supplement on reverse side if project purpose includes any of items 1 through 7. | | 14. Other (explain) | <input type="checkbox"/> |

| Applicant certification and signature | |
|---|----------------------|
| The applicant (a) is responsible for any damages incurred as a result of this drawdown. (b) Certifies the truth of the above statements. | |
| Applicant Signature: <u><i>L F Smith Jr</i></u> | Date: <u>3/30/15</u> |
| Print Name: <u>LOUIS F. (RICK) SMITH JR</u> | |



DEP SUPPLEMENT

Many activities related to reservoir drawdowns require separate DEP and/or U.S. Army Corps of Engineers approval(s) prior to beginning the activity(s). The information provided on or attached to this supplement will be used by the appropriate DEP office to process the necessary state and/or federal authorizations or to determine additional permitting requirements. Providing the information described on this form will allow DEP to complete this review and approval or screening procedure while the drawdown application is being processed.

Often, the applicant has already submitted documentation for the proposed activity to a DEP office. The applicant should still complete this supplement to the drawdown application, indicating what information was sent, and to which office.

The primary purpose of this supplement form is to simplify the submission, review, and approval of minor projects requiring written state or federal authorization. This form and the information attached are not intended to replace state and federal requirements for obtaining individual permits for major projects. The appropriate DEP office having jurisdiction over the proposed activity will generally provide the applicant with a request for additional information, the necessary authorization to proceed with the work, or a determination that an individual permit(s) is required.

Specific Project Information

The following information to be provided for each type of activity does not need to follow any particular format but should provide sufficient detail to allow DEP to establish appropriate jurisdiction, waiver or general permit eligibility, small project eligibility, appropriateness of authorization by letter, or the need for full state or federal permits.

| | Attached | Previously Submitted | | Attached | Previously Submitted |
|--|-------------------------------------|--------------------------|---|--------------------------|--------------------------|
| Dam or Spillway Repairs | | | Construction or Maintenance of Bulkhead, Retaining Wall, or Other Shoreline Structures | | |
| • Engineering plans & specs | <input type="checkbox"/> | <input type="checkbox"/> | • Plan view | <input type="checkbox"/> | <input type="checkbox"/> |
| • Color photos | <input type="checkbox"/> | <input type="checkbox"/> | • Cross-section | <input type="checkbox"/> | <input type="checkbox"/> |
| Dam or Spillway Modification | | | • Details | <input type="checkbox"/> | <input type="checkbox"/> |
| • Conceptual plan & scope of work | <input type="checkbox"/> | <input type="checkbox"/> | Beach Renovation | | |
| • Color Photos | <input type="checkbox"/> | <input type="checkbox"/> | • Plan view | <input type="checkbox"/> | <input type="checkbox"/> |
| Dredging/Disposal of Accumulated Sediment | | | • Cross-section | <input type="checkbox"/> | <input type="checkbox"/> |
| • Color photos | <input type="checkbox"/> | <input type="checkbox"/> | Dock Construction or Maintenance | | |
| • Dredging plan | <input type="checkbox"/> | <input type="checkbox"/> | • Dock plan & design | <input type="checkbox"/> | <input type="checkbox"/> |
| • Disposal plan | <input type="checkbox"/> | <input type="checkbox"/> | • Cross-section | <input type="checkbox"/> | <input type="checkbox"/> |
| Pond Elimination and Backfill | | | | | |
| • Site plan & dimensions of dam & pond | <input checked="" type="checkbox"/> | <input type="checkbox"/> | | | |
| • Drainage area | <input type="checkbox"/> | <input type="checkbox"/> | | | |

Subject: Hydrologic and Hydraulic Review and Update
Milltown Dam

To: File
DEP Division of Dam Safety

From: Ronald Mease, P.E.
Hydrology and Hydraulics Consultant
DEP Division of Dam Safety

By letter dated June 17, 2014, this office requested an incremental analysis to determine the design flood for Milltown Dam. Following this letter, I received a phone call from Rick Smith of East Goshen Township. The request for the analysis was based on the PMF determined during the Phase I inspection in 1981. Therefore, prior to the Township engaging an engineer, this review was conducted to determine whether an incremental analysis was warranted. During this review, an "in-house" incremental analysis was conducted along with a review of the history of the existing structure. The following comments are applicable:

1. The 1981 Phase I study assigned the $\frac{1}{2}$ PMF as the design flood. The peak flow from this design flood was 6500 cfs, and it was determined that the 69-foot long ogee spillway had a capacity of 2063 cfs. This was approximately 26% of the SDF. The spillway capacity was limited by a low point on the top of dam.
2. In 1985, a rehabilitation project was completed based on the 1981 Phase I hydrology. The project include leveling the top of dam and providing riprap overtopping protection. The leveling of the top of dam at EL 350.3 increased the spillway capacity to 3083 cfs. A depth of overtopping for the design flood was estimated at 2.7 feet, with the maximum WSEL at EL 353.
3. Since the 1985 project approval and construction, there have been pertinent changes in dam safety regulations, policy, and engineering methodology. Also, it appears that there is additional development (apartments buildings or townhouses) located downstream of the dam which could be impacted due to a failure of the dam. The following changes are relevant in a reassessment of the dam:
 - Under the 2011 changes in the dam safety regulations for Pennsylvania, the spillway design flood for a high hazard dam is determined by an incremental dam breach analysis. The 1981 assignment of the $\frac{1}{2}$ PMF design flood is no longer applicable.
 - The precipitation data and methodology for determining the Probable Maximum Flood have been revised since 1981.
 - The use of riprap for providing overtopping protection on a high hazard dam is no longer an acceptable practice.
4. An existing HEC-1 model of the dam and watershed were utilized to assess the incremental impacts of a dam failure. NOAA precipitation data for West Chester was utilized to model the 100-year and 500-year floods. The watershed model's computation of the 100-year flood was of the same magnitude as the 100-year flood as determined by USGS regression equations in Streamstats. HMR-51 precipitation was then used to compute an updated $\frac{1}{2}$ PMF.

5. The downstream highway bridge was added to the HEC-1 model, and the HEC-1 model. Breach and non-breach hydrographs were computed for the 100-year flood, the 500-year flood and the ½ PMF. These hydrographs were entered into a HEC-RAS model of the downstream waterway.
6. The HEC-RAS model of downstream conditions was developed using LIDAR 2-foot contours, Arc-GIS and HEC-GeoRAS. Flood levels were compared for breach and non-breach conditions. The HEC-RAS results were exported into Arc-GIS to determine the inundation boundaries.
7. Based on the results of this “in-house” incremental analysis of breach and non-breach flood levels, the updated ½ PMF appears to be the appropriate spillway design flood as required by the Chapter 105 regulations (Section 105.98). This peak flow for this updated ½ PMF is significantly greater than the 1981 design flood. The peak inflow to Milltown Dam for the ½ PMF is 12,704 cfs, whereas spillway capacity is approximately 3000 cfs. The overtopping depth during the ½ PMF is 4.12 feet. Spillway adequacy (prior to overtopping) was determined to be 0.14 PMF.

Attachments:

- *Inundation mapping, HEC-RAS results, and the HEC-1 models for breach and non-breach conditions during the 100-year flood, the 500-year flood, and the ½ PMF.*
- *HEC-1 Model showing existing spillway adequacy of 0.14 PMF.*
- *Other items used in modeling update including NOAA rainfall, Streamstats output, curve number computation, stage-area, etc.*



March 30, 2015

EGOS 0611

Rick Smith, Township Manager
East Goshen Township
1580 Paoli Pike
West Chester, PA 19380

**RE: Milltown Reservoir Dam (DEP Permit No. D15-146)
DEP Meeting**

Dear Rick:

This letter serves to summarize the March 11, 2015 site meeting with the following DEP representatives:

1. Ron Mease, PE, Hydrology and Hydraulics, Division of Dam Safety, Bureau of Waterways Engineering and Wetlands, South-Central Regional Office
2. John Hohenstein, PE, Chief, Dams and Waterways Section, Bureau of Waterways Engineering and Wetlands, Southeast Regional Office
3. Abdel Nassani, PE, Bureau of Waterways Engineering and Wetlands, Southeast Regional Office

At the meeting, DEP made it clear that no funding was currently available for dam maintenance or repairs. Further, a reclassification of the dam to "High Hazard" could bring new requirements, and again, no funding was currently available in this program.

It was agreed with Mr. Nassani that the annual dam inspection would be coordinated for a different date.

Extensive discussions were had regarding a possible breach of the dam. The following preliminary plan was determined:

1. *Spring 2015* – Township obtains a drawdown permit from the Pennsylvania Fish & Boat Commission and proceeds to draw down the water level to that of the intakes.
2. *Summer/Fall 2015* – Observe existing conditions, allow vegetation to naturally re-establish and stabilize newly exposed areas.
3. *Spring 2016* – Coordinating with DEP, proceed to remove a portion of existing spillway, to perhaps half the height of the spillway (specific height to be determined).
4. *Summer/Fall 2016* – Observe existing conditions, allow vegetation to naturally re-establish and stabilize newly exposed areas.
5. *Fall 2016* – Coordinating with DEP, proceed to remove the remaining spillway, the western gate house and mechanical components and a portion of the western embankment, sufficient to pass the 100-year storm event.
6. *Spring/Summer 2017* – Observe existing conditions, allow vegetation to naturally re-establish and stabilize newly exposed areas.

The DEP suggested the Township take the following steps if they intend to pursue a course similar to the above:

1. Obtain draw down permit
2. Prepare correspondence to DEP outlining the overall plan
3. DEP would review and consult with their environmental staff regarding any other possible concerns, permits, etc.
4. DEP would recommend initiating the draw down

DEP also indicated they would be happy to assist in coordinating with the Chester County Conservation District, if needed.

While the environmental and other concerns of our December 9, 2014 memorandum were not completely eliminated, it is our opinion the DEP welcomes the opportunity to remove this dam and would be very accommodating throughout the process.

Should you have any further questions, please contact me.

Sincerely,

PENNONI ASSOCIATES INC.



Nathan M. Cline, PE
Township Engineer

cc: Mark Miller, Director of Public Works (via e-mail)