



REPLY TO
ATTENTION OF

CENAD-RBT

DEPARTMENT OF THE ARMY
NORTH ATLANTIC DIVISION, US ARMY CORPS OF ENGINEERS
FORT HAMILTON MILITARY COMMUNITY
BROOKLYN, NEW YORK 11252-6700

DEC 14 2012
DEC 14 2012

MEMORANDUM FOR Commander, New England District, ATTN: CENAE-EP (Mr. Mackos),
696 Virginia Road, Concord, MA 01742-2751

SUBJECT: Review Plan Approval for Issue Evaluation Study Phase 1, Edward MacDowell Lake
Dam, NH (NID #NH00005)

1. References:

- a. E-Mail, CENAE-EP-WG (Ms. Papadopoulos), subject: CENAE District IESs Review Plans
- b. Memorandum, CEIWR-RMC, 30 Nov 12, subject: Risk Management Center Endorsement-Edward MacDowell Lake Dam, NH – IES Review Plan
- c. EC 1165-2-209, Change 1, Water Resources Policies and Authorities – Civil Works Review Policy, 31 Jan 12
- d. ER 1110-2-1156, Safety of Dams – Policy and Procedures, 28 Oct 11

2. The enclosed Review Plan for the Issue Evaluation Study Phase 1, Edward MacDowell Lake Dam, NH has been prepared in accordance with Reference 1.c. Issue Evaluation Studies (IES) for dams rated as Dam Safety Action Classification (DSAC) II, III and, IV are required by Reference 1.d, and are studies to determine the nature of a safety issue or concern, and the degree of urgency for action within the context of the entire USACE inventory of dams. The purpose of an IES is to focus on significant potential failure modes when evaluating risk, verify the current DSAC rating, guide the selection and gauge the effectiveness of interim risk reduction measures, and justify the need to pursue or not pursue Dam Safety Modification studies. Issue Evaluation Study results are used to assist dam safety officials with making risk informed decisions, and prioritize dam safety studies and investigations within the context of the entire USACE inventory of dams.

3. The Risk Management Center (RMC) is the Review Management Organization (RMO) for the Agency Technical Review (ATR). The RMC has reviewed the Review Plan and recommends MSC approval. An Independent External Peer Review (IEPR) is not required for IES reports.

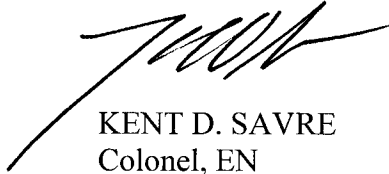
4. The enclosed Review Plan for Issue Evaluation Study Phase 1, Edward MacDowell Lake Dam, NH is approved. The Review Plan is subject to change as circumstances require, consistent with study development under the Project Management Business Process. Subsequent revisions to this Review Plan or its execution will require new written approval from this office.

SUBJECT: Review Plan Approval for Issue Evaluation Study Phase 1, Edward MacDowell Lake Dam, NH (NID #NH00005)

5. In accordance with Reference 1.b, Appendix B, Paragraph 5, this approved Review Plan shall be posted on your district website for public review and comment. The plan will also be posted on NAD's website for review and comment.

6. The Point of Contact for this action is Mr. Daniel Rodriguez, 347-370-4395 or Daniel.J.Rodriguez@usace.army.mil.

Encl
as

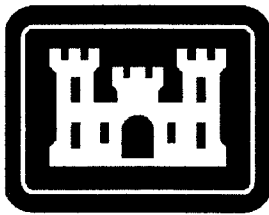


KENT D. SAVRE
Colonel, EN
Commanding

CF (w/ encl):
CEIWR-RMC (T. Bishop)
CENAE-EP-WG (A. Papadopoulos)
CENAE-WP-W (S. Michalak)
CENAD-PD-X (L. Cocchieri)

**Review Plan
U.S. Army Corps of Engineers
North Atlantic District
New England Division**

**Edward MacDowell Lake Dam
Issue Evaluation Study
Phase 1**



**US Army Corps
of Engineers®**

27 November 2012

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ATTACHMENT 1 – Completion of Agency Technical Review

ATTACHMENT 2 – Team Rosters

1. Introduction

a. Purpose

This Review Plan is intended to ensure a quality-engineering Dam Safety Issue Evaluation Study developed by the Corps of Engineers. ER 1110-2-1156, "Dam Safety Policy and Procedures" dated 28 Oct 2011, Chapter 8 describes the Issue Evaluation Study (IES) Plan development, review, and approval process. This Review Plan has been developed for Edward MacDowell Lake Dam. This Review Plan was prepared in accordance with EC 1165-2-209, "Civil Works Review Policy", and covers the review process for the Edward MacDowell Lake Dam Phase 1 IES Report. The IES is a study that may lead to additional studies, modeling, or NEPA consultation. NEPA compliance would occur during the Dam Safety Modification Study Phase. Because the Phase 1 IES is used to justify a Phase 2 Issue Evaluation Studies and potentially Dam Safety Modification (DSM) studies, it is imperative that the vertical teaming efforts are proactive and well coordinated to assure collaboration of the report findings, conclusions, and recommendations, and that there is consensus at all levels of the organization with the recommended path forward.

b. Project Description and Information

Edward MacDowell Lake Dam (originally named as the West Peterborough Dam) was approved by the Chief of Engineers on 30 April 1940 as part of the comprehensive flood control plan for the Merrimack River Basin authorized by the Flood Control Acts approved 22 June 1936 (Public No. 738, 743th Congress) and 28 June 1938 (Public No. 761, 75th Congress). Construction of the project started in 1948, and it became operational in 1950. Total construction cost was \$2,034,300. As of September 2011, it has prevented an estimated \$20,819,000 in flood damages.

Edward McDowell Lake Dam is one of a system of five (5) dams and reservoirs which have been constructed in the Merrimack River Basin for flood damage mitigation purposes and is located in the southwestern portion of New Hampshire on the Nubanusit Brook, which is a tributary of the Contoocook River and then to the Merrimack River. The dam is located a half mile upstream from the village of West Peterborough, New Hampshire. The reservoir has a drainage area of 44 square miles (see Figures on pages 4 and 5 below).

Edward McDowell Dam is a rolled-earth embankment approximately 1,100 feet long with a maximum height of 67 feet. There is a central impervious core flanked with a pervious fill section upstream and a random and pervious fill sections downstream. There is an impervious cut-off trench which extends to grouted bedrock from the right

abutment to about the midpoint of the dam (station 7+40) and then into the glacial till from station 7+40 to the left abutment. The upstream slope is protected with a 3-foot layer of rip rap and the downstream slope is covered with a 6-inch layer of cobbles. The outlet works are located near the right abutment in a cut rock section. The spillway and discharge channel are located in the upper reaches of the reservoir approximately four miles from the dam. Discharges over the spillway will flow into Ferguson Brook and then into the Contoocook River.

A preliminary screening-level risk analysis was performed as part of the FY 2009 Screening Portfolio Risk Assessment (SPRA). The primary concerns identified by SPRA included: 1) Seepage and piping along the exterior of the culvert; 2) Failure from abutment and/or foundation seepage and piping; and 3) Foundation and/or abutment stability and/or liquefaction during the maximum design earthquake (MDE). The SPRA classified Edward MacDowell Lake Dam as a DSAC II.

A PFMA was conducted during the week of 9-13 August 2010. It was facilitated by the USACE Huntington District (LRH) Cadre and was conducted to identify the potential failure modes that were considered to be credible and significant. Of the 28 potential failure modes (PFM), six potential failure modes were identified as credible and significant. The overtopping failure mode was initially ruled out by the cadre, but was put back on the list at the request of NAE because of the highly erodible nature of the downstream slope materials.

The New England District, along with the Huntington District Cadre, performed an Expert Opinion Elicitation (EOE) in November 2010 and prepared a draft Issue Evaluation Study (IES) report. The IES is not a decision document. It is a document that is used to present information that confirms the dam safety issues and supports the need for a dam safety modification study (DSMS), or states the case to revise the current Dam Safety Action Classification (DSAC) rating. There were six potential failure modes that were identified during the PFMA that were evaluated under the IES. Those failure modes included:

1. **PFM # 1 Internal Erosion Through a Cohesionless Foundation Layer** – There is a possibility that a shallow layer of cohesionless soil exists beneath the dam in the vicinity of the old river channel at about Station 7+40 bypassing the impervious core trench. Upstream pool loading causes gradients in the downstream toe region to exceed critical gradients of these near surface materials to a point where backward erosion piping initiates.
2. **PFM #3 Seepage above the conduit through loose or poorly compacted zone of backfill** – The top of the conduit average elevation is 912 feet-NGVD.

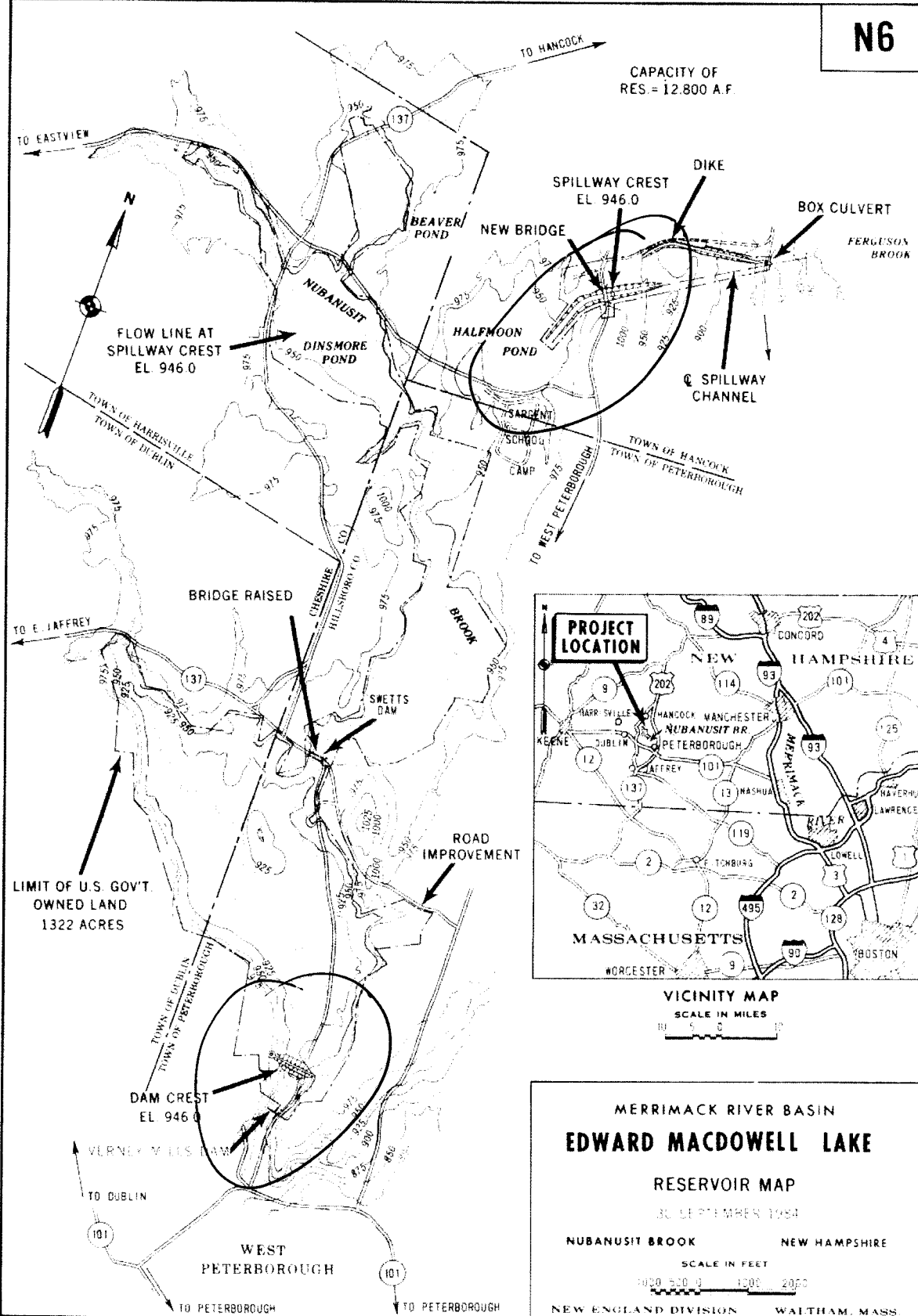
An upstream high pool loading sufficiently develops gradients through a poorly compacted zone of impervious above the conduit to initiate erosion.

3. **PFM #4 Scour embankment core along rock defects of the conduit cut –** There is a possibility there is an open continuous network of fractures (upstream to downstream) in the cut of the bedrock for the conduit, which may have been caused by blasting during construction of the dam. Additionally, impervious fill was placed against the rock cut along the conduit. The pool rises and flow occurs along the open continuous network of fractures in bedrock from the upstream pool to the downstream toe. High velocities of flow through the bedrock fractures cause impervious material to scour along this fracture network.
4. **PFM #4A Seepage of embankment core (erosion) into rock defects – right side of dam –** There is a possibility a continuous joint network exists within the bedrock foundation on the right side of the dam from station 1+00 to 7+40 that contacts the impervious core and extends to an open or unfiltered exit. High pool loading and embankment seepage through the impervious core, flowing out through the joints of the foundation bedrock fills the joints and initiates erosion of the impervious core into the bedrock. Erosion continues because it is unfiltered and creates a void in the core.
5. **PFM #8 Downstream Slope Failure from steady state seepage under all loads –** There is a possibility that a pool loading of a significant duration could cause saturation of the embankment, increase pore pressure, and reduce shear strengths of the downstream embankment and foundation materials.
6. **PFM #13 Overtopping -** There is a possibility that the pool could rise above the spillway crest; debris and/or ice gets carried into the spillway channel by spillway flows. Build-up of debris and/or ice begins to restrict spillway flows and inflows continue to exceed spillway and outlet discharges, increasing reservoir elevation until it approaches or exceeds the top of the dam. Overwash and/or overtopping flows of the main embankment begin to erode the downstream face and progress until downcutting occurs leading to breach of the embankment.

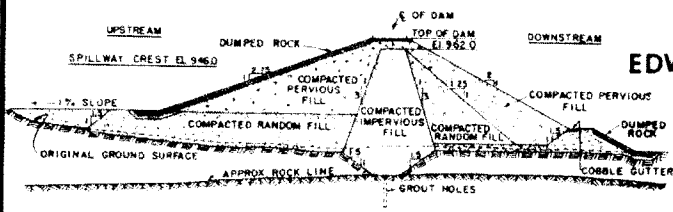
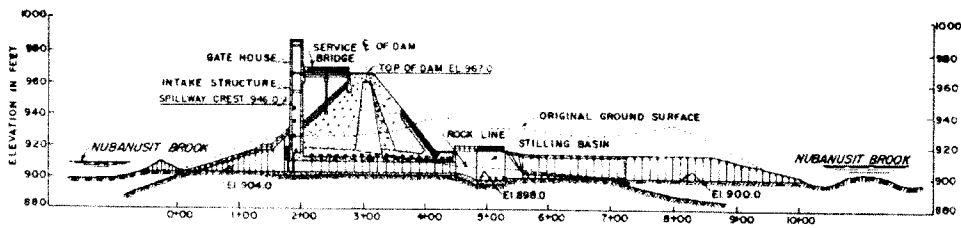
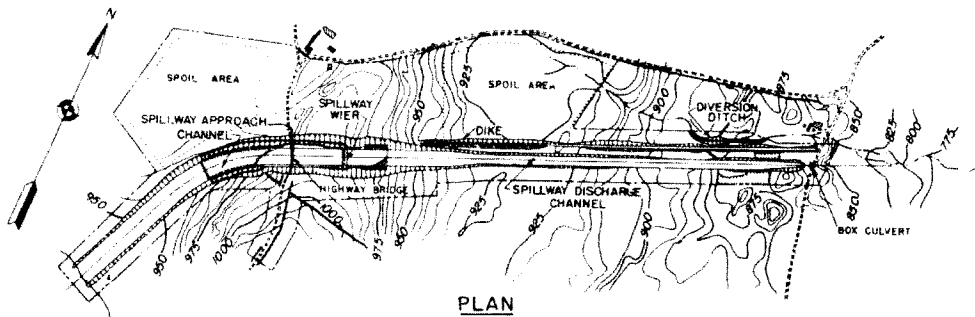
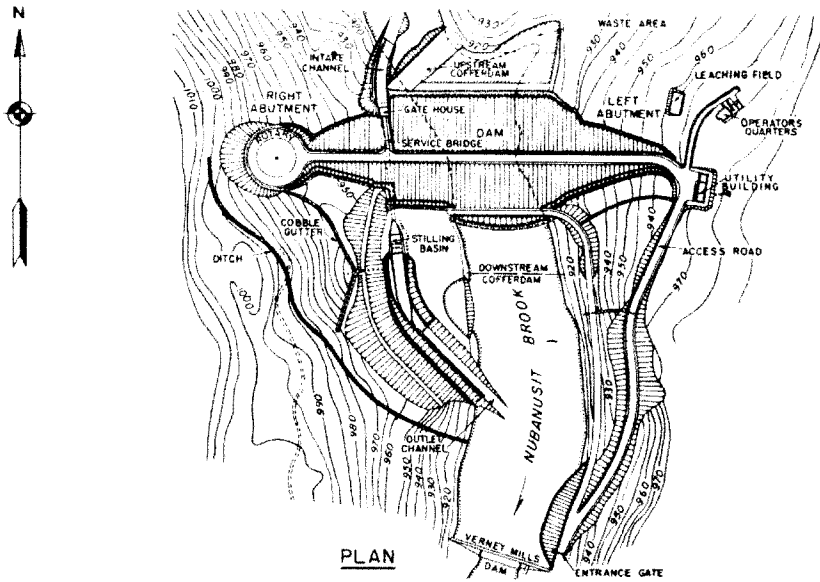
The project was placed into suspended status and no further work was to be completed until direction from the RMC in September 2011.

The IES work that has been performed to date is now scheduled to be reviewed by the USACE Southwest Division (SWD) cadre in March 2013. The new cadre will review all the available data pertinent to the dam. The current draft IES will then be updated and finalized for review as described herein.

N6



N6a



MERRIMACK RIVER BASIN
EDWARD MAC DOWELL DAM
PLAN & SECTIONS

NUBANUSIT BROOK NEW HAMPSHIRE
 30 SEPTEMBER 1976
 NOT TO SCALE

New England Division Waltham, Mass.

c. Levels of Review

IES Reviews shall include:

- District Quality Control (DQC)
- Agency Technical Review (ATR)

RMC Reviews shall include:

- Quality Control and Consistency Review (RMC staff and/or external experts)

Independent External Peer Review (IEPR) is applied in cases that meet certain criteria. This IES is not a decision document and does not cover work requiring a Type I or Type II IEPR. Issue Evaluation Studies are used to justify Dam Safety Modification Studies. If this project requires a Dam Safety Modification Study, both Type I and Type II IEPR will be conducted, as appropriate.

d. Review Team

Review Management Office: The USACE Risk Management Center (RMC) is the Review Management Organization (RMO) for dam safety related work, including this IES. Contents of this review plan have been coordinated with the RMC and the North Atlantic Division (NAD), the Major Subordinate Command (MSC). Informal coordination with NAD will occur throughout the IES development, including briefings to the NAD Dam Safety Committee and Program Review Board updates. In-Progress Review (IPR) team meetings with the RMC, NAD, and HQ will be scheduled on an “as needed” basis to discuss programmatic, policy, and technical matters. The NAD Dam Safety Program Manager will be the POC for vertical team coordination. This review plan will be updated for each new project phase.

Agency Technical Review Team:

Required ATR Team Expertise: The ATR team will be chosen based on each individual's qualifications and experience with similar projects.

ATR Lead: The ATR team is a senior professional with extensive experience in preparing Civil Works documents and conducting ATRs (or ITRs). The lead has the necessary skills and experience to lead a virtual team through the ATR process. The ATR lead for Edward MacDowell Lake Dam should be a geotechnical engineer and may also serve as a reviewer for his or her specific discipline.

Geotechnical Engineer - shall have experience in the field of geotechnical engineering, analysis, design, and construction of earth embankment dams. The geotechnical engineer shall have experience in subsurface investigations, rock and soil

mechanics, internal erosion (seepage and piping), slope stability evaluations, erosion protection design, and earthwork construction. The geotechnical engineer shall have knowledge and experience in the forensic investigation of seepage, settlement, stability, and deformation problems associated with high head dams and appurtenances constructed on rock and soil foundations.

Engineering Geologist - shall have experience in assessing internal erosion (seepage and piping) beneath earth embankment dams constructed on bedrock and overburden formations. The engineering geologist shall be familiar with identification of geological hazards, exploration techniques, field and laboratory testing, and instrumentation. The engineering geologist shall be experienced in the design of grout curtains and must be knowledgeable in grout theology, concrete mix designs, and other materials used in foundation seepage barriers.

Hydraulic Engineer – shall have experience in the analysis and design of hydraulic structures related to dams including the design of hydraulic structures (e.g., spillways, outlet works, and stilling basins). The hydraulic engineer shall be knowledgeable and experienced with the routing of inflow hydrographs through multipurpose flood control reservoirs utilizing multiple discharge devices, Corps application of risk and uncertainty analyses in flood damage reduction studies, and standard Corps hydrologic and hydraulic computer models used in drawdown studies, dam break inundation studies, hydrologic modeling and analysis for dam safety investigations.

Mechanical Engineer –shall have experience in machine design, machine rehabilitation and familiarity with design of mechanical gates and controls for flood control structures.

Structural Engineer – shall have experience and be proficient in performing stability analysis, finite element analysis, seismic time history studies, and external stability analysis including foundations on high head mass concrete dams. The structural engineer shall have specialized experience in the design, construction and analysis of concrete dams.

Economist (or Consequence Specialist) – shall be knowledgeable of policies and guidelines of ER 1110-2-1156 as well as experienced in analyzing flood risk management projects in accordance with ER 1105-2-100, the Planning Guidance Notebook. The economist shall be knowledgeable and experienced with standard Corps computer models and techniques used to estimate population at risk, life loss, and economic damages.

2. Requirements

a. Reviews

The review of all work products will be in accordance with the requirements of EC 1165-2-209 by following the guidelines established within this review plan. All engineering and design products will undergo District Quality Control Reviews.

i. *District Quality Control (DQC)*

DQC is the review of basic science and engineering work products focused on fulfilling the project quality requirements. DQC will be performed for all district engineering products by staff not involved in the work and/or study. Basic quality control tools include a plan providing for seamless review, quality checks and reviews, supervisory reviews, Project Delivery Team (PDT) reviews, etc.

ii. *Agency Technical Review (ATR)*

ATR is an in-depth review, managed within USACE, and conducted by a qualified team outside of the home district that is not involved in the day-to-day production of the project/product. The purpose of this review is to ensure the proper application of clearly established criteria, regulations, laws, codes, principles and professional practices. The ATR team reviews the various work products and assure that all the parts fit together as a coherent whole. ATR teams will be comprised of senior USACE personnel (Regional Technical Specialists, etc.), and may be supplemented by outside experts as appropriate. To assure independence, the leader of the ATR team shall be from outside the home Major Subordinate Command (MSC).

iii. *Independent External Peer Review (IEPR)*

IEPR is the most independent level of review, and is applied in cases that meet certain criteria. This IES is not a decision document and does not cover work requiring a Type I or Type II IEPR. Issue Evaluation Studies are used to justify Dam Safety Modification Studies. If this project requires a Dam Safety Modification Study, both Type I and Type II IEPR will be conducted.

iv. *Policy and Legal Compliance Review*

Policy and Legal Compliance Review is required for decision documents. Since this IES is not a decision document it does not require a Policy and Legal Compliance Review. If this project requires a Dam Safety Modification Study, a Policy and Legal Compliance Review will be conducted.

v. *Peer Review of Sponsor In-Kind Contributions*

There will be no in-kind contributions for this IES.

b. Approvals

i. Review Plan Approval and Updates

The MSC for this IES is the North Atlantic Division. The MSC Commander is responsible for approving this Review Plan. The Commander's approval reflects vertical team input (involving the New England District, MSC, RMC and HQUSACE members) as to the appropriate scope and level of review for the study and endorsement by the RMC. Like the PMP, the Review Plan is a living document and may change as the study progresses. The District is responsible for keeping the Review Plan up to date. Minor changes to the review plan since the last MSC Commander approval will be documented in an Attachment to this plan. Significant changes to the Review Plan (such as changes to the scope and/or level of review) should be re-endorsed by the RMC and re-approved by the MSC Commander following the process used for initially approving the plan. The latest version of the Review Plan, along with the Commanders' approval memorandum, will be posted on the District's webpage and linked to the HQUSACE webpage.

ii. IES Report

The IES Report shall undergo a DQC and formal ATR. After the ATR, the PDT will present the IES to the Quality Control and Consistency (QCC) Panel for review. The district and the risk assessment cadre present the IES risk assessment, IES findings, conclusions, and recommendations for review. After the QCC meeting, the Risk Cadre and RMC will certify that the risk estimate was completed in accordance with the Corps' current guidelines and risk management best practices. The IES will then be presented to the Senior Oversight Group (SOG). The SOG generally consists of the following members: Special Assistant for Dam Safety (Chair); CoP & Regional Representatives to include Geotechnical and Materials CoP Leader, Structural CoP Leader, and Hydraulics and Hydrologic CoP Leader; Regional representatives determined by Special Assistant for Dam Safety; Corps Business Line & Program Representatives to include DSPM, Flood Damage Reduction, Navigation, Programs, and Director, Risk Management Center; and any other Representatives determined by the Special Assistant for Dam Safety. The District Dam Safety Officer (DSO), the MSC DSO, and the SOG Chairman will jointly approve the final IES after all comments are resolved.

3. Guidance and Policy References

- ER 5-1-11, USACE Business Process
- EC 1165-2-209, Civil Works Review Policy, 31 Jan 2010
- ER 1110-2-1156, Safety of Dams – Policy and Procedure, 28 Oct 2011
- ER 1110-1-12, Quality Management, 31 Mar 2011

4. Summary of Required Levels of Review

The dam safety program follows the policy review process described in EC1165-2-209, Civil Works Review Policy. The RMC will be the review management office for the ATR, and the RMC must certify that the risk assessment was completed in accordance with the USACE current guidelines and best risk management practices. A QCC review will be conducted including the district, MSC, and RMC. The district and the risk assessment cadre will present the IES risk assessment, IES findings, conclusions, and recommendations for review. After resolution of QCC review comments, the MSC and HQUSACE will complete quality assurance and policy compliance review.

5. Models

a. General

The use of certified or approved models for all planning activities is required by EC 1105-2-407. The EC defines planning models as any models and analytical tools that planners use to define water resources management problems and opportunities, to formulate potential alternatives to address the problems and take advantage of the opportunities, to evaluate potential effects of alternatives, and to support decision-making. The EC does not cover engineering models. Engineering software is being addressed under the Engineering and Construction (E&C) Science and Engineering Technology (SET) initiative. Until an appropriate process that documents the quality of commonly used engineering software is developed through the SET initiative, engineering type models will not be reviewed for certification and approval. The responsible use of well-known and proven USACE developed and commercial engineering software will continue and the professional practice of documenting the application of the software and modeling results will be followed.

b. List

Model	Status
N/A – Planning models not used	

6. Review Schedule

Project Phase / Submittal	Review Start*	Review Complete
DQC Review	28 May 2013	21 Jun 2013
ATR Review	24 Jun 2013	19 Jul 2013
Report Revisions and Back Check	22 Jul 2013	2 Aug 2013
Submit Report to QCC	5 Aug 2013	
QCC Review	5 Aug 2013	30 Aug 2013
Report Revisions	3 Sep 2013	20 Sep 2013
Submit Report to SOG	23 Sep 2013	
SOG Review	23 Sep 2013	18 Oct 2013
Report Revisions	21 Oct 2013	15 Nov 2013

*Note schedule is dependent upon the actual EOE and completion of the report by all parties

7. Public Participation

Public participation will not take place until the IES phase is completed. Public and stakeholder coordination has been performed to inform interested parties about the DSAC II rating and ongoing IES. Findings of the Final IES will also be shared with appropriate stakeholders. If this project results in a Dam Safety Modification Study (DSMS), future public coordination will occur for NEPA compliance.

8. Cost Estimate

Task Description	Review Start	Review Cost
DQC Review	28 May 2013	\$ 45,500
ATR Review	24 Jun 2013	\$ 50,500
QCC Review	5 Aug 2013	\$ 50,000
SOG Review	23 Sep 2013	\$ 60,000

9. Execution Plan

a. District Quality Control

i. General

DQC will be conducted after completion of the final draft IES Report. DQC requires both supervisory oversight and District technical experts. The district will conduct a robust DQC in accordance with EC 1165-2-209, Civil Works Review Policy, the District's Quality Management Plan, and ER 1110-2-12, Quality Management. Documentation of DQC activities is required and will be in accordance with the District and MSC Quality manuals. Comments and responses from DQC will be available for the ATR team to review through ProjNet DrChecks.

ii. DQC Review and Control

The District DSAC Project Manager will schedule DQC review meetings. The in progress review meetings should include PDT members from Geotechnical, Hydrology & Hydraulics, Structures, Mechanical, General Engineering, Cost Engineering, Project Management, Planning, and Operations as applicable. DQC Review will be conducted on the completed final draft IES including all Sections and Appendixes and will include comments, back check and IES revisions. ProjNet DrChecks review software will be used to document reviewer comments, responses and associated resolutions. Comments should be limited to those that are required to ensure the adequacy of the product.

b. Agency Technical Review

i. General

Draft ER 1110-2-1156, Chapter 8 describes the purpose, process, roles and responsibilities for an IES in addition to the submittal, review, and approval process. The Risk Management Center (RMC) is responsible for coordinating and managing agency technical review of the IES Report in accordance with EC 1165-2-209. The ATR Lead will be an RMC team member unless otherwise approved by the RMC Director. The ATR Lead in cooperation with the PDT, MSC, and vertical team will determine the final make-up of the ATR team.

ii. ATR Review and Control

Reviews will be conducted in a fashion which promotes dialogue regarding the quality and adequacy of the IES and baseline risk assessment necessary to achieve the purposes of the IES. The ATR team will review the IES report which includes supporting risk and stability analysis documentation. A QCC of the baseline risk estimate and supporting documentation will be performed under the leadership of the RMC. Therefore, the level of effort for each ATR reviewer is expected to be between 16 and 32 hours. DrChecks review software will be used to document reviewer comments, responses and associated resolutions. Comments should be limited to those that are required to ensure the adequacy of the product. The RMC in conjunction with the MSC, will prepare the charge to the reviewers, containing instructions regarding the objective of the review and the specific advice sought. A kick off meeting will be held with the ATR team to familiarize reviewers with the details of the project.

The four key parts of a review comment will normally include:

- (1) The review concern – identify the product's information deficiency or incorrect application of policy, guidance, or procedures.

- (2) The basis for the concern – cite the appropriate law, policy, guidance, or procedure that has not been properly followed.
- (3) The significance of the concern – indicate the importance of the concern with regard to its potential impact on the plan selection, recommended plan components, efficiency (cost), effectiveness (function/outputs), implementation responsibilities, safety, Federal interest, or public acceptability.
- (4) The probable specific action needed to resolve the concern – identify the action(s) that the PDT must take to resolve the concern.

In some situations, especially addressing incomplete or unclear information, comments may seek clarification in order to then assess whether further specific concerns may exist. The ATR documentation in DrChecks will include the text of each ATR concern, the PDT response, a brief summary of the pertinent points in any discussion, including any vertical coordination, and lastly the agreed upon resolution. The ATR team will prepare a Review Report which includes a summary of each unresolved issue; each unresolved issue will be raised to the vertical team for resolution. Review Reports will be considered an integral part of the ATR documentation and shall also:

- (1) Disclose the names of the reviewers, their organizational affiliations, and include a short paragraph on both the credentials and relevant experiences of each reviewer.
- (2) Include the charge to the reviewers prepared by the RMC in accordance with EC 1165-2-209, 7c.
- (3) Describe the nature of their review and their findings and conclusions.
- (4) Include a verbatim copy of each reviewer's comments and the PDT's responses.

ATR may be certified when all ATR concerns are either resolved or referred to HQUSACE for resolution and the ATR documentation is complete. Certification of ATR should be completed, based on work reviewed to date, for the final report. A draft certification is included in Attachment 1.

10. Review Plan Points of Contact

Name/Title	Organization	Email/Phone
Daniel Rodriguez/ NAD Dam Safety Program Manager	CENAD-RB-T	daniel.j.rodriguez@usace.army.mil
Dave Carlson/ Program Manager Eastern Division	CEIWR-RMC	david.e.carlson@usace.army.mil
Tom Bishop / Review Manager	CEIWR-RMC	thomas.w.bishop@usace.army.mil

ATTACHMENT 1

COMPLETION OF AGENCY TECHNICAL REVIEW

The Agency Technical Review (ATR) has been completed for the *Issue Evaluation Study for Edward MacDowell Lake Dam, West Peterborough, NH*. The ATR was conducted as defined in the project's Review Plan to comply with the requirements of EC 1165-2-209. During the ATR, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of: assumptions, methods, procedures, and material used in analyses, alternatives evaluated, the appropriateness of data used and level obtained, and reasonableness of the results, including whether the product meets the customer's needs consistent with law and existing US Army Corps of Engineers policy. The ATR also assessed the District Quality Control (DQC) documentation and made the determination that the DQC activities employed appear to be appropriate and effective. All comments resulting from the ATR have been resolved and the comments have been closed in DrCheckssm.

TBD
ATR Team Leader
Office Symbol/Company

Date

TBD
Project Manager
CENAE

Date

NATHAN SNORTELAND, P.E.
Director, Risk Management Center
CEIWR-RMC

Date

CERTIFICATION OF AGENCY TECHNICAL REVIEW

Significant concerns and the explanation of the resolution are as follows: Describe the major technical concerns and their resolution. As noted above, all concerns resulting from the ATR of the project have been fully resolved.

ANTHONY T. MAKOS, P.E.
Chief, Engineering/Planning Division
CENAE-EP

Date

SCOTT C. MICHALAK, P.E.
Dam Safety Officer¹
CENAE-EP-W

Date

¹ Only needed if different from the Chief, Engineering Division.

ATTACHEMENT 2: TEAM ROSTERS
NAE PROJECT DELIVERY TEAM (PDT)

Name/Title	Section	Email/Phone
Laura Fraser / Geotechnical Engineer	Project Manager/Geotechnical Engineering	Laura.C.Fraser@usace.army.mil 978-318-8068
Tracy Dorgan /Geologist	Geology and Chemistry	Tracy.H.Dorgan@usace.army.mil 978-318-8499
Patrick Blumeris /Hydrologic Engineer	Water Management	Patrick.M.Blumeris@usace.army.mil 978-318-8737
Dave Descoteaux /Structural/Mechanical Engineer	Civil Engineering	David.R.Descoteaux@usace.army.mil 978-318-8083
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District Quality Control Team

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Agency Technical Review Team*

**To Be Determined*

Discipline	Phone	Years of Experience	Credentials
/ATR Lead/Geotechnical Engineer			
/Hydrology/Hydraulics Engineer			
/Engineering Geologist			
/ Economist/Consequences			

QCC Review Team to Be Determined at a later date