



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, SOUTHWESTERN DIVISION
1100 COMMERCE STREET
DALLAS, TEXAS 75242-0216

14 JUN 2010


CESWD-RBT

MEMORANDUM FOR Commander, Tulsa District (CESWT-EC), 1645 South 101st East Avenue, Tulsa OK 74128-4609

SUBJECT: Review Plan Approval for Canton Lake Dam Safety Assurance Project, North Canadian River, Oklahoma

1. Reference memorandum, CESWT-EC, 9 April 2010, subject: Dam Safety Assurance Project Review Plan, Canton Lake, North Canadian River, Oklahoma.
2. The enclosed Review Plan was prepared in accordance with EC 1165-2-209, Civil Works Review Policy, dated 31 January 2010. It was coordinated with the Risk Management Center, Institute of Water Resources, which is the lead office to execute this plan. (For further information, contact Mr. Nathan Snorteland of the RMC at 571-232-9189.)
3. I approve this review plan. It is subject to change as circumstances require, consistent with study and construction development under the Program Management Business Process. Subsequent revisions to this Review Plan or its execution will require a new written approval from this office.
4. POC for this memorandum is Mr. Tommy Schmidt (CESWD-RBT) at 469-487-7091.

Encl


ANTHONY C. FUNKHOUSER
Colonel, EN
Commander

CF:
CESWD-RBT
CESWD-RIT (Sandy Gore, CEMP-SWD)
CECW-CE (Tutka)
CECO-C-RAO (Pearre)
CESWD-PDC (Russo)



DEPARTMENT OF ARMY
CORPS OF ENGINEERS, TULSA DISTRICT
1645 SOUTH 101ST EAST AVENUE
TULSA, OKLAHOMA 74128-4609

CESWT-EC

9 APR 2010

MEMORANDUM FOR Commander, Southwestern Division (CESWD-RBT)

SUBJECT: Dam Safety Assurance Project Review Plan, Canton Lake, North Canadian River, Oklahoma

1. The Canton Lake Dam Safety Assurance Project Review Plan and draft approval memorandum are enclosed for review and approval. The Review Plan includes three levels of review, District Quality Control, Agency Technical Review, and Type II Independent External Peer Review.
2. The technical POC for the Review Plan is Ms. Michelle Lay (CESWT-EC-DS) at 918-669-4380.

2 Encl


ANTHONY C. FUNKHOUSER, P.E.
Colonel, U.S. Army
District Commander

CF:
CECW-CE (Dalton) (with enclosures)
CEIWR-RMC (Snorteland) (with enclosures)
CESWD-RBT (Nolen) (with enclosures)

REVIEW PLAN



**US Army Corps
of Engineers®**

Canton Dam Safety Assurance Project

Canton Lake
North Canadian River, Oklahoma

18 March 2010

Encl I

REVIEW PLAN

Canton Dam Safety Assurance Project

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1. PURPOSE AND REQUIREMENTS

a. **Purpose.** This Review Plan (RP) defines the scope and level of peer review for the Canton Dam Safety Assurance Project.

b. References

- (1) Engineer Regulation (ER) 1110-2-12, Quality Management, 30 Sep 2006
- (2) Canton Dam Safety Assurance Project, Oklahoma, Project Management Plan, 10 Jul 2006
- (3) Canton Dam Safety Assurance Project, Oklahoma, Quality Management Plan, 11 Jan 2010
- (4) Engineer Circular (EC) 1165-2-209, Civil Works Review Policy, 31 January 2010

c. **Requirements.** This review plan was developed in accordance with EC 1165-2-209, which establishes the procedures for ensuring the quality and credibility of U.S. Army Corps of Engineers (USACE) decision, implementation, and operations and maintenance documents and work products. The EC outlines three levels of review: District Quality Control, Agency Technical Review, and Independent External Peer Review. In addition to these three levels of review, documents are subject to policy and legal compliance review and, if applicable, safety assurance review and model certification/approval.

- (1) District Quality Control (DQC). DQC is the review of basic science and engineering work products focused on fulfilling the project quality requirements defined in the Project Management Plan (PMP). It is managed in the home district and may be conducted by staff in the home district as long as they are not doing the work involved in the study, including contracted work, that is being reviewed. Basic quality control tools include a Quality Management Plan (QMP) providing for seamless quality checks and reviews (including quality control performed by contractors), supervisory reviews, Project Delivery Team (PDT) reviews, etc. Additionally, the PDT is responsible for a complete review of plans, specifications, and design documentation to assure overall integrity. The Major Subordinate Command (MSC)/District quality management plans address the conduct and documentation of this fundamental level of review.
- (2) 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 assures that all the parts fit together in a coherent whole. ATR teams will be comprised of senior USACE personnel (Regional Technical Specialists (RTS), 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 MSC.
- (3) Independent External Peer Review (IEPR), Safety Assurance Review (SAR). A Type II IEPR (SAR) shall be conducted on design and construction activities for flood risk management projects. This applies to major repair, rehabilitation, replacement, or modification of existing facilities. The requirement is based upon Section 2035 of WRDA 2007, the OMB Peer Review Bulletin and other USACE policy considerations. External panels will conduct reviews of the design and construction activities prior to the initiation of physical construction and, until construction activities are completed, periodically thereafter on a regular schedule. The Federal Advisory Committee Act (FACA) imposes requirements

on groups established by statute, or established or utilized by an agency that provide advice or recommendations to the agency pertaining to policy. Section 2035 of WRDA 2007 does not specifically exempt panels for Type II IEPR from FACA.

2. PROJECT INFORMATION

- a. **Project Description.** Canton Dam has for several years been included on the HQUSACE (HQ) list of deficient projects under the Dam Safety Assurance (DSA) Program due to its hydrologic deficiencies. In addition, the static stability of the spillway structure has been the subject of discussion and investigation for over a quarter century. In the late 90's Tulsa District (SWT) concluded that the structure was deficient with respect to stability for high pools and with concurrence from SWD, HQs enforced pool restrictions on the project. Canton Lake was included on the Dam Safety High Priority List and subsequently SWT was given authority to proceed directly to a DSA Program Evaluation Report addressing the hydrologic deficiencies. A Dam Safety Assurance Program Evaluation Report was completed in March 2001 and approved by HQ in March of 2002.

The purpose of the Dam Safety Assurance Program Evaluation Report was to present safety modifications relating to hydraulic deficiencies at the project due to new criteria associated with passing the Probable Maximum Flood (PMF) and changes in the state-of-the-art design criteria. Two serious and interrelated hydrologic deficiencies were identified at Canton Lake: 1) inadequate factors of safety against spillway sliding and 2) uncontrolled embankment overtopping by the Probable Maximum Flood (PMF). Concerns about design shear strengths of the rock foundation used in the original spillway calculations led to new sampling and testing activities. It was determined that the existing spillway was not stable against sliding with the spillway gates closed for pool elevations within the flood pool. As a result, Canton Lake was placed under restrictions limiting the pool to an elevation 12 feet below the top of the authorized flood control elevation. The second noted deficiency of embankment overtopping results from inadequate discharge capability when the PMF is routed through the project.

As a result of the Dam Safety Assurance Program Evaluation Report, planning and design were pursued to provide anchoring of the existing spillway to improve sliding stability and to provide a fuse gated auxiliary spillway in the left embankment to increase the projects discharge capacity. In 2003, SWT began further analysis of the left bank spillway and after detailed geotechnical analysis it was determined that the right bank was more suitable for the auxiliary spillway. Funding was significantly constrained in 2005. In FY 2006 funding resumed and a Spillway Stabilization contract was awarded to Nicholson Construction on 17 November 2005 for \$4,525,000. This contract was for the installation of 64 rock anchors as well as instrumentation to monitor the spillway during the anchor installation process. The contract was completed 25 October 2006.

In 2005, HQ decided to implement a new risk assessment process for dam safety where a Screening Portfolio Risk Assessment (SPRA) was accomplished on the 10% highest risk dams in the COE. The SPRA is based on a probabilistic, risk-based method of determining relative risk. Out of this assessment came the recommendation to include a long standing issue of seepage and seismic concerns for the project.

The embankment portion of Canton Dam is founded on 20 to 50 feet of alluvial and eolian soil consisting primarily of sands and silty sands with some silt and clay seams. A horizontal drain and sand filled toe was the only seepage control feature constructed when the dam was built. High piezometer pressures were observed at a pool elevation four feet below the current conservation pool shortly after the reservoir started filling. Emergency funding was requested and relief wells were

installed to reduce this pressure. The relief wells have controlled the pressures adequately at or near conservation pools but as the relief wells deteriorate the pressures begin to rise again. Additionally the relief wells have not been tested at pool elevations greater than five feet above conservation pool in almost 50 years. In 2003, SWT began a study to determine whether the relief wells would provide adequate seepage control at the top of flood pool. The results of the seepage study indicated the factor of safety against seepage failure was less than one. A screening level risk analysis of Canton Dam was performed by the Corps of Engineers SPRA team in July 2005. The SPRA team reviewed all documentation available for the dam and concluded the embankment foundation and seepage control system was inadequate to prevent seepage failure of the dam.

SWT conducted a Seismic Safety Review (SSR) in 2005 in accordance with Southwest Division's comments on the Dam Safety Assurance Report. The results of the SSR indicate the foundation could liquefy during the Maximum Credible Earthquake (MCE) resulting in unacceptable factors of safety for upstream and downstream slope stability. Also, failure of the embankment could result during the MCE due to the high loading caused by the earthquake even if the foundation does not liquefy. Embankment failures due to an MCE could result in permanent deformations of the embankment ranging from 1 to 10 feet. These deformations would not cause immediate loss of the pool, however, the current seepage control system would be severely damaged or destroyed resulting in the loss of the pool. Potential failure of the embankment due to a MCE could be prevented if an adequate seepage control measure was constructed that would not fail during an earthquake.

In March 2006 Headquarters Dam Safety requested that a Summary Update Evaluation Report be prepared due to all of the changes that occurred since the initial Dam Safety Evaluation Report was approved. The Summary Update Evaluation Report addressed the major design changes, inclusion of both seepage and seismic conditions, and a cost estimate update. The Summary Update Evaluation Report was prepared in July 2006. The report looked at seven right-abutment alternatives with varying sill elevations; three with tainter gates and four with fuse gates, in addition three separate spoil area were also evaluated. The selected plan was the optimum economic solution consisting of 9 fuse gates founded on a broad-crested weir with a sill elevation of 1604. Total estimated excavation quantity is 3,200,000 cubic yards spoiled at the toe of the existing dam to eliminate the seepage and seismic issues. The current cost estimate of the selected plan which resolves the hydrologic, seepage and seismic deficiencies is \$148.4M.

- b. **Project Phasing.** Design and construction of the auxiliary spillway will occur in phases. Fiscal year milestones are outlined in the Project Management Plan. Only those project phases remaining are addressed in this RP.
- c. **In-Kind Contributions.** Not Applicable. Currently there is a water supply agreement in place whereby Oklahoma City pays 15% of 25.5% of the cost of this project.

3. DISTRICT QUALITY CONTROL (DQC) REVIEWS

- a. **General.** DQC is addressed in the Quality Management Plan for the Canton Dam Safety Project. Reviews under this heading include peer reviews performed within the District/Division boundaries; over the shoulder reviews; and Bid-ability, Constructability, Operability, and Environmental (BCOE) Reviews.
- b. **Products for Review.** Key products for review include plans, specifications, and design documentation reports for the remaining project phases. Remaining project phases include the new

highway bridge, weir and outlet works, and phase II excavation. A milestone schedule report is included as ATTACHMENT 1.

4. AGENCY TECHNICAL REVIEW (ATR)

- a. **General.** ATR for implementation documents covered by EC 1165-2-209 paragraph 9 and Appendix C is managed and performed outside of the home district. The ATR shall ensure that the product is consistent with established criteria, guidance, procedures, and policy. The ATR will assess whether the analyses presented are technically correct and comply with published USACE guidance, and that the document explains the analyses and the results in a reasonably clear manner for the public and decision makers. Members of the ATR team will be from outside the home district. The ATR lead will be from outside the home MSC. The Review Management Office (RMO) for ATR is the USACE Risk Management Center.
- b. **Products for Review.** Key products for review include plans, specifications, and design documentation reports for the remaining project phases. In addition, the ATR team will examine relevant DQC records and provide written comment in the ATR report as to the adequacy of the DQC effort. Remaining project phases include the new highway bridge, weir and outlet works, and phase II excavation. A milestone schedule report is included as ATTACHMENT 1.
- c. **Required ATR Team Expertise.** ATR teams will comprise senior USACE personnel (Regional Technical Specialists (RTS), etc.), and may be supplemented by outside experts as appropriate. The disciplines represented on the ATR team will reflect the significant disciplines involved in the engineering and design effort. These disciplines include geotechnical, dam safety risk assessment, structural, civil, cost engineering, and hydraulic. A list of the ATR members and disciplines is provided in ATTACHMENT 2. The chief criterion for being a member of the ATR team is knowledge of the technical discipline and relevant experience.
- d. **Documentation of ATR.** DrChecks review software will be used to document all ATR comments, responses and associated resolutions accomplished throughout the review process. Comments should be limited to those that are required to ensure adequacy of the product. The four key parts of a quality 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 design components, efficiency (cost), effectiveness (function/outputs), implementation responsibilities, safety, Federal interest, or public acceptability; and
 - (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:

- Disclose the names of the reviewers, their organizational affiliations, and include a short paragraph on both the credentials and relevant experiences of each reviewer;
- Include the charge to the reviewers;
- Describe the nature of their review and their findings and conclusions; and
- 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. A sample certification based on the one included in ER 1110-2-12 can be found in ATTACHMENT 3. Once finalized, the Review Report will be included in the appropriate Design Documentation Report.

5. INDEPENDENT EXTERNAL PEER REVIEW (IEPR)

- a. **General.** The reviews shall consider the adequacy, appropriateness, and acceptability of the design and construction activities for the purpose of assuring that good science, sound engineering, and public health, safety, and welfare are the most important factors that determine a project's fate. The Review Management Office for Type II IEPR reviews is the USACE Risk Management Center. Panel members will be selected using the National Academies of Science (NAS) policy for selecting reviewers.
- b. **Products for Review.** A listing of key products for review can be found in ATTACHMENT 4.
- c. **Required IEPR Panel Expertise.** In the future, the USACE Risk Management Center acting as the RMO will use IDIQ contracts with A/E firms. The A/E firms will be responsible for assembling a panel that meets the requirements set forth by the National Academy of Sciences. The RMO will require that each member of the IEPR panel shall have a professional engineer license and/or a professional geologist license, and a minimum of 20 years of experience in their field of expertise. Initially, the RMO responsibility will rest with the MSC. The Tulsa District will use an existing IDIQ contract with an A/E firm to establish the IEPR panel. The IEPR will consist of a five person panel to include members that have expertise in the following areas: a) Dam Safety & Embankment Dam Design; b) Seepage and Piping Analysis; c) Geotechnical, Structural, Hydraulic design. The information on proposed panel disciplines is in ATTACHMENT 2.
- e. **Documentation of IEPR.** Dr Checks review software will be used to document IEPR comments and aid in the preparation of the Review Report. Comments should address the adequacy and acceptability of the economic, engineering and environmental methods, models, and analyses used. IEPR comments should generally include the same four key parts as described for ATR comments in Section 4. The IEPR team will prepare a Review Report that will accompany the publication of the final report for the project and shall:
 - Disclose the names of the reviewers, their organizational affiliations, and include a short paragraph on both the credentials and relevant experiences of each reviewer;
 - Include the charge to the reviewers;
 - Describe the nature of their review and their findings and conclusions; and
 - Include a verbatim copy of each reviewer's comments (either with or without specific attributions), or represent the views of the group as a whole, including any disparate and dissenting views.

The MSC Chief of Business Technical Division will approve the final report. After receiving the report from the panel, the District Chief of Engineering shall consider all comments contained in the

report and prepare a written response for all comments and note concurrence and subsequent action or non-concurrence with an explanation. The District Chief of Engineering shall submit the panel's report and the District's responses shall be submitted to the MSC for final MSC Commander approval and then make the report and responses available to the public on the District's website.

6. REVIEW SCHEDULES AND COSTS

- a. ATR Schedule and Cost.** The estimated cost per ATR is \$25,000. The next scheduled milestone for ATR is the 65% Weir Design Documentation which is scheduled to begin 13 September 2010 and be complete by 30 September 2010 including resolution of all comments. An ATR is scheduled for the 65% Phase II Excavation Design Documentation in January of 2011.
- b. IEPR Schedule and Cost.** Milestones to consider for a Type II IEPR (SAR) are at the record of final design in the Design Documentation Report; at the completion of the plans, specifications, and cost estimate; at the midpoint of construction for a particular contract, prior to final inspection, or at any critical design or construction decision milestones. The District recommends conducting IEPR reviews at the same time as the ATR reviews listed above. Therefore, the first IEPR would take place in September 2010. The District has estimated \$350,000 for all IEPR efforts. More detailed information on key products can be found in ATTACHMENT 4 and more detailed information on schedule can be found in ATTACHMENT 1.
- c. Model Certification/Approval Schedule and Cost.** Hydraulic modeling of the Canton Dam Safety Project was completed in 2009 via contract with Hydroplus, Inc and Alden Laboratories.

7. PUBLIC PARTICIPATION

As required by EC 1165-2-209, the approved Review Plan will be posted on the District public website for public comment. While there is not a formal comment period, the public will have an opportunity to comment on the types of reviews to be carried out. If and when comments are received, the PDT shall consider them and decide if revisions to the review plan are necessary. Periodically, meetings are held with personnel from Oklahoma City, the cost share partner, and with other stakeholders, congressional leaders, and the public.

8. RMC COORDINATION

The lead center of expertise for this Review Plan and the IEPR reviews listed is the Headquarters Risk Management Center. Per EC 1165-2-209, the Project Manager is responsible for coordination with the RMC.

9. MSC APPROVAL

The MSC that oversees the home district is responsible for approving the review plan. Approval is provided by the MSC Commander. The commander's approval should reflect vertical team input (involving district, MSC, RMC, and HQUSACE members) as to the appropriate scope and level of review for the decision document. Like the PMP, the review plan is a living document and may change as the study progresses. Changes to the review plan should be approved by following the process used for initially approving the plan. In all cases the MSCs will review the decision on the level of review and any changes made in updates to the project.

10. REVIEW PLAN POINTS OF CONTACT

Questions and/or comments on this review plan can be directed to the following points of contact:

- Dan Bruggenjohann, Tulsa District Project Manager 918-669-7211
- Wade Anderson, Tulsa District Dam Safety Program Manager 918-669-7654
- Michelle Lay, Tulsa District Technical Manager 918-669-4380

ATTACHMENT 1: CURRENT SCHEDULE

This attachment outlines major milestones for the project.

Data as of: 19-Mar-10

Dan's - Milestone report Canton

Project	BL1 Finish	Project WBS	MBS Name	Milestone - Civil Works	Milestone - Constr	Activity Name	BL1 Start	Start	Variance - BL1 Start Date	BL1 FINISH	FINISH	Variance - BL1 Finish Date
116926 MS-CW Canton, OK, Dam Safety												
16-Mar-10												
116926	116926.300001.2.30050	Roadway Relocation - Construction				Roadway Fiscal Completion			0.0	16-Mar-10	16-Mar-10*	0.0
116926	116926.300001.7.300AD	Fuse Gates Plans & Specs				Hydro Modeling Report Milestone			0.0	16-Mar-10	16-Mar-10*	0.0
116926	116926.300001.8.300AD	Plug Removal Plans & Specs				Plug Removal Plans and Specs 35% Complete			0.0	16-Mar-10	16-Mar-10*	0.0
Subtotal							16-Mar-10	16-Mar-10	0.0	16-Mar-10	16-Mar-10	0.0
10-May-10												
116926	116926.300001.8.300AD	Plug Removal Plans & Specs				Ph11 Well Config			0.0	10-May-10	10-May-10*	0.0
Subtotal							10-May-10	10-May-10	0.0	10-May-10	10-May-10	0.0
11-May-10												
116926	116926.300001.5.30050	Construction - Bridge				Bridge RTA			0.0	11-May-10	11-May-10*	0.0
Subtotal							11-May-10	11-May-10	0.0	11-May-10	11-May-10	0.0
14-Jun-10												
116926	116926.300001.6.300AD	Wdr Plans & Specs				Control Tower and Conduit Design 35% Milestone			0.0	14-Jun-10	14-Jun-10*	0.0
Subtotal							14-Jun-10	14-Jun-10	0.0	14-Jun-10	14-Jun-10	0.0
30-Jul-10												
116926	116926.300001.6.300AD	Plug Removal Plans & Specs	CW300			Plug Removal Plans and Specs 95% Complete			0.0	30-Jul-10	30-Jul-10*	0.0
Subtotal							30-Jul-10	30-Jul-10	0.0	30-Jul-10	30-Jul-10	0.0
30-Jul-10												
116926	116926.300001.6.300AD	Plug Removal Plans & Specs				Ph11 Well Config 95% Design Documents			0.0	30-Jul-10	30-Jul-10*	0.0
Subtotal							30-Jul-10	30-Jul-10	0.0	30-Jul-10	30-Jul-10	0.0
12-Aug-10												
116926	116926.300001.5.30050	Construction - Bridge				Bridge Const Contract Award			0.0	12-Aug-10	12-Aug-10*	0.0
Subtotal							12-Aug-10	12-Aug-10	0.0	12-Aug-10	12-Aug-10	0.0
27-Sep-10												
116926	116926.300001.5.30050	Construction - Bridge		CC600		Bridge Const Contract Award - PPMD			0.0	27-Sep-10	27-Sep-10*	0.0
Subtotal							27-Sep-10	27-Sep-10	0.0	27-Sep-10	27-Sep-10	0.0
30-Sep-10												
116926	116926.300001.6.300AD	Plug Removal Plans & Specs	CW350			Plug Removal Plans & Specs Approval			0.0	30-Sep-10	30-Sep-10*	0.0
Subtotal							30-Sep-10	30-Sep-10	0.0	30-Sep-10	30-Sep-10	0.0
29-Oct-10												
116926	116926.300001.5.30050	Construction - Bridge				Bridge Const RFP Acknowledged	29-Oct-10	29-Oct-10*	0.0	29-Oct-10	29-Oct-10	0.0
Subtotal							29-Oct-10	29-Oct-10	0.0	29-Oct-10	29-Oct-10	0.0
29-Oct-10												
116926	116926.300001.4.30050	Construction - Excav & Seepage Dam				Excavation Physical Completion			0.0	29-Oct-10	29-Oct-10*	0.0
116926	116926.300001.4.30050	Construction - Heavy & Seepage Dam	CW150			Excavation Physical Completion - PPMD			0.0	29-Oct-10	29-Oct-10*	0.0
Subtotal							29-Oct-10	29-Oct-10	0.0	29-Oct-10	29-Oct-10	0.0
15-Dec-10												
116926	116926.300001.6.300AD	Wdr Plans & Specs		CW010		Control Tower & Conduit Start Design Plans & Specs - PPMD	15-Dec-10	15-Dec-10*	0.0			0.0
Subtotal							15-Dec-10	15-Dec-10	0.0	15-Dec-10	15-Dec-10	0.0
28-Feb-11												
116926	116926.300001.10.30050	Construction - Renovate Project Office				Project Office Fiscal Completion			0.0	28-Feb-11	28-Feb-11*	0.0
Subtotal							28-Feb-11	28-Feb-11	0.0	28-Feb-11	28-Feb-11	0.0
01-Mar-11												
116926	116926.300001.10.30050	Construction - Renovate Project Office		CW170		Project Office Fiscal Completion - PPMD			0.0	01-Mar-11	01-Mar-11*	0.0
Subtotal							01-Mar-11	01-Mar-11	0.0	01-Mar-11	01-Mar-11	0.0

Dan's - Milestone report Canton

Project												
BL1 Finish	Project ID	WBS	WBS Name	Milestone - CWR	Milestone - WBS	Activity Name	BL1 Start	Start	Variance - BL1 Start Date	BL1 Finish	Finish	Variance - BL1 Finish Date
	116926	116926.300001.6.300A0	Weir Plans & Specs	CV330	Construc	Weir Plans & Specs Completed - PPMD			0.0	20-May-11	20-May-11*	0.0
Subtotal							26-May-11	26-May-11	0.0	26-May-11	26-May-11	0.0
27-May-11												
	116926	116926.300001.7.300S0	Construction - Fuse Gates			Fuzgate Pre-Solicitation (FB)	27-May-11	27-May-11*	0.0			0.0
	116926	116926.300001.7.300S0	Construction - Fuse Gates			Fuzgate Solicitation	27-May-11	27-May-11*	0.0			0.0
Subtotal							27-May-11	27-May-11	0.0	27-May-11	27-May-11	0.0
27-May-11												
	116926	116926.300001.8.300A0	Weir Plans & Specs			Weir & Control Tower & Control DOR Final			0.0	27-May-11	27-May-11*	0.0
	116926	116926.300001.8.300A0	Weir Plans & Specs			Weir & Control Tower & Control RFA - SUBM			0.0	27-May-11	27-May-11*	0.0
Subtotal							27-May-11	27-May-11	0.0	27-May-11	27-May-11	0.0
29-Jun-11												
	116926	116926.300001.4.300S0	Construction - E-way & Seepage Dam	CV470		Excavation Fiscal Completion - PPMD			0.0	29-Jun-11	29-Jun-11*	0.0
Subtotal							28-Jun-11	28-Jun-11	0.0	28-Jun-11	28-Jun-11	0.0
30-Jun-11												
	116926	116926.300001.5.300S0	Construction - Bridge			Bridge Physical Completion			0.0	30-Jun-11	30-Jun-11*	0.0
Subtotal							30-Jun-11	30-Jun-11	0.0	30-Jun-11	30-Jun-11	0.0
01-Jul-11												
	116926	116926.300001.5.300S0	Construction - Bridge	CV450		Bridge Physical Completion - PPMD			0.0	01-Jul-11	01-Jul-11*	0.0
Subtotal							01-Jul-11	01-Jul-11	0.0	01-Jul-11	01-Jul-11	0.0
29-Aug-11												
	116926	116926.300001.32.300S	Construction - Utility Reloc Phase 2 - Utilities Relocated on Bridge			Utilities on Bridge Reloc Plans & Specs Final			0.0	29-Aug-11	29-Aug-11	0.0
Subtotal							29-Aug-11	29-Aug-11	0.0	29-Aug-11	29-Aug-11	0.0
30-Sep-11												
	116926	116926.300001.7.300S0	Construction - Fuse Gates			Fuzgate Award of Contract	30-Sep-11	30-Sep-11*	0.0			0.0
Subtotal							30-Sep-11	30-Sep-11	0.0	30-Sep-11	30-Sep-11	0.0
12-Dec-11												
	116926	116926.300001.32.300S	Construction - Utility Reloc Phase 2 - Utilities Relocated on Bridge	CC300		Utility on Bridge Relocation Contract Award - PPMD			0.0	12-Dec-11	12-Dec-11*	0.0
Subtotal							12-Dec-11	12-Dec-11	0.0	12-Dec-11	12-Dec-11	0.0
23-Dec-11												
	116926	116926.300001.32.300S	Construction - Utility Reloc Phase 2 - Utilities Relocated on Bridge			Utility on Bridge Relocation Contract Award	23-Dec-11	23-Dec-11	0.0			0.0
Subtotal							23-Dec-11	23-Dec-11	0.0	23-Dec-11	23-Dec-11	0.0
09-Jan-12												
	116926	116926.300001.7.300S0	Construction - Fuse Gates			Fuzgate Procurement - Authority to Advise	09-Jan-12	09-Jan-12*	0.0			0.0
Subtotal							09-Jan-12	09-Jan-12	0.0	09-Jan-12	09-Jan-12	0.0
31-Jan-12												
	116926	116926.300001.5.300S0	Construction - Bridge			Bridge Fiscal Completion			0.0	31-Jan-12	31-Jan-12*	0.0
	116926	116926.300001.5.300S0	Construction - Bridge	CV470		Bridge Fiscal Completion - PPMD			0.0	31-Jan-12	31-Jan-12*	0.0
Subtotal							31-Jan-12	31-Jan-12	0.0	31-Jan-12	31-Jan-12	0.0
15-Mar-12												
	116926	116926.300001.32.300S	Construction - Utility Reloc Phase 2 - Utilities Relocated on Bridge	CV450		Utility on Bridge Relocation Physically Complete - PPMD			0.0	15-Mar-12	15-Mar-12*	0.0
Subtotal							15-Mar-12	15-Mar-12	0.0	15-Mar-12	15-Mar-12	0.0
09-May-12												
	116926	116926.300001.32.300S	Construction - Utility Reloc Phase 2 - Utilities Relocated on Bridge	CV470		Utility on Bridge Relocation Physically Complete - PPMD			0.0	09-May-12	09-May-12*	0.0

Dan's - Milestone report Canton

Project	BL1 Finish	Project WBS ID	WBS Name	Milestone - Civil Works	Milestone - Constr	Activity Name	BL1 Start	Start	Variance - BL1 Start Date	BL1 Finish	Finish	Variance - BL1 Finish Date
		116926	116926.0000017.300S0	Construction - Fuse Gates	CC830	Fuse Gates Construction Completion			0.0	30-Sep-13	30-Sep-13*	0.0
		116926	116926.0000017.300S0	Construction - Fuse Gates	CC830	Fuse Gate Contract Required Completion			0.0	30-Sep-13	30-Sep-13*	0.0
		Subtotal					30-Sep-13	30-Sep-13	0.0	30-Sep-13	30-Sep-13	0.0
		19-Jun-10										
		116926	116926.0000018.300S0	Construction - Plug Removal	CC840	Physical Completion Plug Removal			0.0	19-Jun-15	19-Jun-15*	0.0
		Subtotal					19-Jun-15	19-Jun-15	0.0	19-Jun-15	19-Jun-15	0.0
		30-Sep-15										
		116926	116926.0000018.300S0	Construction - Plug Removal	CC830	Plug Removal Contract Required Completion			0.0	30-Sep-15	30-Sep-15*	0.0
		Subtotal					30-Sep-15	30-Sep-15	0.0	30-Sep-15	30-Sep-15	0.0
		30-Sep-15										
		116926	116926.0000018.300S0	Construction - Plug Removal	CC830	Contract Final Completion Plug Removal			0.0	30-Sep-15	30-Sep-15*	0.0
		Subtotal					30-Sep-15	30-Sep-15	0.0	30-Sep-15	30-Sep-15	0.0
		01-Oct-15										
		116926	116926.0000018.300S0	Construction - Plug Removal	CC830	Plug Removal Construction Completion			0.0	01-Oct-15	01-Oct-15*	0.0
		Subtotal					01-Oct-15	01-Oct-15	0.0	01-Oct-15	01-Oct-15	0.0

ATTACHMENT 2: TEAM ROSTERS

TABLE 1: Agency Technical Review Team – 65% Weir Design Documentation		
NAME	DISCIPLINE	OFFICE SYMBOL
John Kedzierski	Structural/Team Leader	CENAE-EP-DG
Siamac Vaghar	Geotechnical	CENAE-EP-WG
Patrick Blumeris	Hydrology and Hydraulics	CENAE-EP-WM

TABLE 2: Agency Technical Review Team – 65% Phase II Excavation Design Documentation		
NAME	DISCIPLINE	OFFICE SYMBOL
TBD	Geotechnical/Team Leader	TBD
TBD	Civil	TBD
TBD	Structural	TBD
TBD	Hydrology and Hydraulics	TBD

TABLE 3: Recommended External Peer Review Panel		
NAME	DISCIPLINE	EDUCATION & EXPERIENCE
Keith Ferguson	Geotechnical, P.E.	MS in Geotechnical Engineering, 30+ years experience in design, construction, and risk assessment of dams
Francisco Silva	Geotechnical, P.E.	PhD in Geotechnical Engineering from MIT, 35+ years experience in design, construction, and risk assessment of dams
Steven Poulos	Geotechnical	PhD in Geotechnical Engineering from Harvard, 45+ years experience on embankment dam design and rehabilitation
Andrew Clevenger	Civil, P.E.	MS in Environmental Engineering, BS in Civil Engineering, 14 years experience in hydraulic analysis, floodplain mapping, dam break analysis.
TBD	Structural, P.E.	

Project Delivery Team

A complete listing of the project delivery team can be found in the Project Management Plan.

Vertical Team

The Vertical Team consists of members of the HQUSACE and CESWD Offices. The Vertical Team plays a key role in facilitating execution of the project in accordance with the PMP. The Vertical Team is responsible for providing the PDT with Issue Resolution support and guidance as required. The Vertical Team will remain engaged seamlessly throughout the project via monthly telecons as required and will attend In Progress Reviews and other key decision briefings. The CESWD District Liaison is the District PM's primary Point of Contact on the Vertical Team.

ATTACHMENT 3: ATR CERTIFICATION TEMPLATE

Statement of Completion of Agency Technical Review

The District has completed the _____ for the Canton Dam Safety Assurance Project, Oklahoma. Notice is hereby given that an agency technical review, that is appropriate to the level or first and complexity inherent to the project, has been conducted as defined in the Quality Control Plan. During the agency technical review, 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 result. The agency technical review was accomplished by a review panel from _____. All comments resulting from the ATR have been resolved.

Reviewers:

Name, Structural Review

Name, Geotechnical Review

Name, Hydraulic Review

Project Delivery Team Members:

Name, Discipline

Name, Discipline

Name, Technical Management

Certification of Agency Technical Review

Significant concerns and the explanation of the resolution are attached in the form of a DrChecks review. The attached documents that all concerns resulting from agency technical review of the _____ have been fully resolved.

Clif B. Warren, P.E.,
Chief, Engineering and Construction Division

ATTACHMENT 4: PRODUCTS FOR IEPR REVIEW

This attachment provides a listing of key products that should be considered for review by the IEPR panel. ATTACHMENT 4 contains key scheduled milestones for future products.

Bridge Design:

The Bridge plans and specifications were 95% complete in the fall of 2009. The Oklahoma Department of Transportation participated in the design process through review. The plans and specifications will be ready to advertise in May of 2010 and a contract award is expected by September 2010.

Fuse Gate Design:

The Fuse Gate plans and specifications will be 65% complete in March of 2010. Design completion is anticipated by May 2010. This design will then be packaged to advertise with the Weir, Wet Well, Control Tower, and Intake designs in May 2011.

Weir, Wet Well, Control Tower, and Intake Design:

The plans and specifications for the Weir were 35% complete in February 2010. The plans and specifications for the Wet Well, Control Tower, and Intake will be 35% complete in June 2010. The plans and specifications for all the above components will be 65% complete in August 2010 and 95% complete in March 2011. These components as well as the Fuse Gates will be advertised in May 2011 and contract award is anticipated by September 2011.

Excavation Phase II (Plug Removal) Design:

The design for this phase will kick off in March 2010. Plans and specifications are scheduled to be 35% complete in September 2010, 65% complete in February 2011, and 95% complete in July of 2011. This design will be advertised in January of 2013 and contract award is anticipated by July 2013.

Supplement to the Dam Safety Modification Report:

A second Supplement to the Dam Safety Modification Report was submitted to Southwestern Division in February 2010.

Suggested products for first IEPR in September 2010:

- 35% plans and specifications for Excavation Phase II
- 65% plans and specifications for Weir, Wet Well, Control Tower, and Intake
- 100% plans and specifications for Fuse Gates
- Supplement to the Dam Safety Modification Report
- In-progress construction
- Associated Design Documentation Reports

Suggested products for second IEPR in March 2011:

- 65% plans and specifications for Excavation Phase II
- 95% plans and specifications for Weir, Wet Well, Control Tower, and Intake
- In-progress construction
- Associated Design Documentation Reports