Susitna-Watana Hydroelectric Project
(FERC No. 14241)

Probable Maximum Flood (PMF) Study
Study Plan Section 16.5

Initial Study Report
Part C: Executive Summary and Section 7

Prepared for

Alaska Energy Authority

SUSITNA-WATANA HYDRO

Clean, reliable energy for the next 100 years.

Prepared by

MWH

June 2014

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EXECUTIVE SUMMARY

Probable Maximum Flood (PMF) Study 16.5	
Purpose	The purpose of the study is to develop the inflow design flood (the PMF) for Watana Dam. The PMF inflow hydrograph will be routed through the reservoir and be used to size the spillway and to subsequently determine the crest level of the dam to ensure flood safety of the dam. The PMF results from the Probable Maximum Precipitation (PMP), which is also developed as a part of this study, and other coincident conditions including snowmelt.
Status	A Final Draft of the PMF Study, including the site-specific PMP, has been completed and is attached as Attachment 1 to this ISR. Draft PMF and PMP reports were provided to the Independent Board of Consultants (BOC) prior to the April 2-4, 2014 BOC meeting. Written comments from the BOC have been addressed in the Final Draft PMF Study.
Study Components	The major study components include the following: (1) data acquisition of meteorological, hydrological, and snow data, (2) historical data analysis, (3) review of previous Susitna PMF studies, (4) a field visit, (5) study reviews by a Board of Consultants, (6) runoff model selection, (7) runoff model calibration and verification, (8) development of a site specific PMP, (9) development of snowpack and other conditions coincident with seasonal PMP storms, (10) reservoir routing of the PMF, (11) spillway sizing, (12) freeboard analysis, and (13) reporting.
2013 Variances	There were no variances from the RSP that would limit the accuracy, effectiveness or utility of the PMP and PMF results. The most significant variance from the RSP was to increase the number of calibration and verification floods from the standard three to six floods. As the PMF study progressed, it became clear that floods resulting from two different dominant sources (rainfall and snowmelt) must be considered. Choosing three floods of each type doubled the need for historic meteorological data development and flood calibration and verification, but ensured the accuracy of the ultimate controlling PMF hydrograph.
Steps to Complete the Study	The PMF Study is complete subject to inclusion of any additional responses to potential comments from the BOC and others, which would be addressed in the USR.
Highlighted Results and Achievements	All thirteen PMF Study Components identified above have been completed. Completion of the PMF Study enables finalization of the feasibility-level configuration of Watana Dam and allows the dam studies to proceed to more detailed design phases.

7. COMPLETING THE STUDY

7.1. Proposed Methodologies and Modifications

AEA has implemented the methods described in Section 4 of this Study Plan and has completed a Final Draft Probable Maximum Flood Study. The Independent Board of Consultants (BOC) was provided with a complete Draft PMF Study in April, 2014, including the site-specific PMP. Written comments received from the BOC following a April 2014 review meeting have been addressed in the Final Draft PMF Study. To the extent that additional comments on the Final Draft PMF Study are received from the BOC or others, they will be addressed in the USR

7.1.1. Decision Points from Study Plan

There were no decision points in the FERC-approved Study Plan to be evaluated for this study following the completion of 2013 work.

7.1.2. Modifications to Study Plan

No modifications to the Study Plan are needed to complete the study and meet Study Plan objectives.

7.2. Schedule

In general, the schedule for completing the FERC-approved Study Plan is dependent upon several factors, including Project funding levels authorized by the Alaska State Legislature and other events outside the reasonable control of AEA. For these reasons, the Study Plan implementation schedule is subject to change, although at this time AEA expects to complete the FERC-approved Study Plan through filing of the Updated Study Report by February 1, 2016, in accordance with the ILP schedule issued by FERC on January 28, 2014.

With regard to this specific study, all data collection and analyses are complete and a final PMF report will be reported in the USR.

7.3. Conclusion

A Final Draft of the Probable Maximum Flood (PMF) Study has been completed and is included as Attachment 1 to this ISR. The Final Draft PMF Study completes all components outlined in the FERC-approved Study Plan. PMF Study tasks completed during 2014 include the following:

- the site-specific PMP and report;
- runoff model historic flood calibration and verification;
- intermediate flood routing to determine the reservoir level at which the spillway gates begin to open;
- development of alternative coincident conditions for the PMF;

- PMF inflow hydrograph model runs for alternative PMP temporal distributions, various seasonal PMP and snowpack cases, and several PMF sensitivity runs;
- reservoir routing of the alternative PMF inflow hydrographs to determine the critical PMF case;
- spillway sizing;
- freeboard analysis;
- comparisons of the current PMF with previous Susitna PMF studies; and
- completion of a Final Draft PMF Report that is complete in all aspects subject only to receipt of review comments.

A meeting of the Independent Board of Consultants (BOC) was held in Bellevue, Washington during April 2-4, 2014. The BOC was provided with a complete Draft PMF Study, including the site-specific PMP, and presentations of the PMP and PMF were made to the BOC. Written comments received from the BOC following the April 2014 meeting have been addressed in the Final Draft PMF Study. To the extent that additional comments on the Final Draft PMF Study are received from the BOC or others, they will be addressed in the USR.

PART C – ATTACHMENT 1: FINAL DRAFT PROBABLE MAXIMUM FLOOD STUDY REPORT

[See separate file for Attachment.]