

Project 515-23-600 Create Market Capital Assets Master Plan – Michigan

Attachment C – VAHCS-Specific Survey(s)

1. VA ANN ARBOR HCS:

- a. No VAHCS-specific survey.

2. VA BATTLE CREEK HCS:

- a. Biomass System Economic and Life Cycle Cost Analysis – Evaluation of the viability of overhauling and placing back into service then existing Combined Heating and Power (CHP) plant. The CHP includes a Nexterra gasification system comprised of all equipment including fuel receiving, gasification, oxidizer, electrostatic precipitator, and a B&W boiler. The plant's boiler is fueled by either gasification generated syngas or separately on natural gas. The boiler produces 24,000 pounds/hour of super-heated steam, at 600 psi, to drive a turbine/generator while utilizing excess steam to offset heating demands at the VAMC. The generator is designed to produce 2,191 kW of electricity at maximum load, which is approximately 80% of the Battle Creek VAMC's peak demand. The plant has been non-operational since 2016 while technical data was approved by the office of HEFP. The current cost for biomass (wood chips), natural gas, as well as additional staffing, are significant changes to the original assumptions that formed the basis of the project and determination of cost-effective operation.

The analysis shall evaluate the operational costs of placing the CHP plant into long term storage, operating the CHP fueling on biomass, and operating the CHP while fueling on natural gas. Long term storage would entail operating the three existing boilers; one 20 klb/hr, 85 Operating PSIG and two 40 klb/hr, 85 Operating PSIG which are fueled on natural gas. Future decisions on the CHP system will be based on overhauling, operator staffing, fuel, and maintenance costs. Considerations for impacts of each scenario on greenhouse gas emissions will be included in the analysis. The report shall additionally include:

- (1) Load curves for steam and electric loads based on analysis of site utility data

- (2) Annual energy profiles, costs, and greenhouse gas emissions for scenarios considering:

- i. Place the CHP Plant into long term storage and operate the current boiler plant only

- ii. Operate the CHP Plant on natural gas and supplement steam demand with the existing conventional natural gas boiler plant
- iii. Operate the CHP Plant on biomass (wood chips) and supplement steam demand with the existing conventional boiler plant

(3) Description of operating cost differences between the three options to include maintenance and staff

(4) Comparison of 20-year lifecycle costs for these scenarios using NIST energy cost escalators considering:

- i. Place the CHP Plant into long term storage and operate the current boiler plant only
- ii. Operate the CHP Plant on natural gas and supplement steam demand with the existing conventional natural gas boiler plant
- iii. Operate the CHP Plant on biomass (wood chips) and supplement steam demand with the existing conventional boiler plant

(5) Summary of life cycle cost analysis

(6) Impacts on the station's air emissions permit, and costs associated with changes to the permit (both short term and ongoing).

The analysis shall generally be formatted like the attached example report ("FW: Chillicothe Biomass Boiler Update.msg") prepared by the VHA Office of Healthcare Engineering for another VAHCS.

The HCS shall provide all relevant historical utility and maintenance data required to complete the analysis, the original economic analysis documents from when the biomass boiler system was designed and constructed, completed design documents produced under project 515-11-128, and a 2022 analysis completed for the CHP plant by Battle Creek VAMC, Facilities Management Service.

b. Electrical Redundancy Study and Analysis of Options – For the Battle Creek VAMC site, conduct a study to develop and analyze options to construct a secondary site electrical feed, on-site electrical generation, or a combination of the two equivalent to at least 100 percent of the site's present day power requirements. The purpose of the secondary feed and/or on-site generation is redundancy (i.e., backup) of the electrical service for the site in accordance with VA requirements stated in *VA Physical Security and Resiliency Design Manual (PSRDM)*, specifically Paragraph 8.2.2 *Electrical* and

9.3.1 *Standby Electrical System*. The study shall (at the minimum) consist of three stages:

Stage One shall verify calculations of existing and future electrical capacity needs for the site based on the facility master plan, current and upcoming capital projects, electrical utility bills and other electrical consumption records to be provided by VAHCS. The A/E via on-site investigation and document review shall develop a model to account for a growth/reduction in capacity over a ten year period.

Stage Two shall determine and verify capacity of the local electric utility provider to provide a secondary feed to the site, documenting any deviations from the PSRDM requirements for circuit/substation connections and physical separation of entrance to the site. The A/E shall also evaluate the viability of on-site electrical generation to meet PSRDM requirements including building/structure siting, routing of electrical feeds and upgrades of existing electrical switchgear.

Stage Three shall consist of preparing at least two options for the VAHCS to evaluate for constructing the secondary feed, on-site generation, or a combination of the two. Options shall include cost estimates considering an appropriate life cycle of not less than 10 years, required modifications to site real property and infrastructure, projected impacts (including power outages and estimated durations) and a summary of any required changes to the electrical service contracts between the electric utility provider and VAHCS.

Due to the requirement to coordinate with the local electric utility provider and the inability at the time of writing this scope to determine utility's availability to provide input, this redundancy study does not need to be performed within the stated period of performance for Part One of the master plan study, but must be complete no later than the beginning of Part 3, Subpart 3B. Within these parameters, the local project manager/Alternate COR and the A/E shall determine the best schedule for providing the following submittals:

(1) Stage One Submittal – A narrative presentation of facts, sufficiently complete, to demonstrate that the redundancy study concepts are fully understood, and that subsequent details, and their ultimate presentation in the final recommendations, will be based on sound architectural and engineering decisions. Conceptual drawings, data sheets and calculations will be included to show:

- Verified calculations of existing and future electrical capacity needs for the site
- Coordinated with the electric utility provider to identify relevant records and specifications to determine capacity
- Conducted preliminary research to identify relevant factors for construction of on-site generation

(2) Stage Two Submittal – A narrative presentation of facts, sufficiently complete, to demonstrate that the State One results are being further developed. Refined drawings, data sheets and calculations will additionally be included to show:

- Completed the capacity evaluation of electric utility provider and clearly state its suitability to act as the redundant electrical service for the site
- If a second feed from the provider is suitable, identified all relevant record drawings, diagrams, specifications, and other associated records related to the site along the potential route(s) for the secondary feed
- If a second feed from the utility is suitable, determined if the current location and capacity of site's switchgear is appropriate, and identified alternatives if it is not
- Completed evaluation of construction of on-site generation and clearly state its suitability to act as the redundant electrical service for the site
- If on-site generation is suitable, identified all relevant record drawings, diagrams, specifications, and other associated records related to site for location of on-site generation and related infrastructure
- For any PSRDM waivers required, draft waivers shall be prepared for submission to the VHA Office of Healthcare Engineering by the VAHCS.

(3) Stage Three Submittal – A narrative presentation of facts, sufficiently complete, to demonstrate that the Stage Two results were developed to their final recommendations. Completed drawings, data sheets, calculations and cost estimates will additionally be included to show:

- Prepared at least two options for the construction of the redundant electrical service
- Provided life cycle cost comparison of the developed options over an appropriate time frame not less than ten years
- Provided copies of communications between the A/E and the electric utility provider regarding any required changes to the VAHCS electrical service contracts

The VAHCS will provide input on its preferred option and the project will be placed into one of the five-year generalized op plans (i.e., Years 6-10) for the system unless the system desires to complete the project sooner. If more than one electrical redundancy project recommended under this or an identical study is planned within a market, only one redundancy project shall be planned within any one fiscal year.

3. VA DETROIT HCS:

- a. No VAHCS-specific survey.

4. VA SAGINAW HCS:

b. Electrical Redundancy Study and Analysis of Options – For the Aleda E. Lutz VAMC site, conduct a study to develop and analyze options to construct a secondary site electrical feed, on-site electrical generation, or a combination of the two equivalent to at least 100 percent of the site's present day power requirements. The purpose of the secondary feed and/or on-site generation is redundancy (i.e., backup) of the electrical service for the site in accordance with VA requirements stated in *VA Physical Security and Resiliency Design Manual (PSRDM)*, specifically Paragraph 8.2.2 *Electrical* and 9.3.1 *Standby Electrical System*. The study shall (at the minimum) consist of three stages:

Stage One shall verify calculations of existing and future electrical capacity needs for the site based on the facility master plan, current and upcoming capital projects, electrical utility bills and other electrical consumption records to be provided by VAHCS. The A/E via on-site investigation and document review shall develop a model to account for a growth/reduction in capacity over a ten year period.

Stage Two shall determine and verify capacity of the local electric utility provider to provide a secondary feed to the site, documenting any deviations from the PSRDM requirements for circuit/substation connections and physical separation of entrance to the site. The A/E shall also evaluate the viability of on-site electrical generation to meet PSRDM requirements including building/structure siting, routing of electrical feeds and upgrades of existing electrical switchgear.

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- Verified calculations of existing and future electrical capacity needs for the site
- Coordinated with the electric utility provider to identify relevant records and specifications to determine capacity
- Conducted preliminary research to identify relevant factors for construction of on-site generation

(2) Stage Two Submittal – A narrative presentation of facts, sufficiently complete, to demonstrate that the Stage One results are being further developed. Refined drawings, data sheets and calculations will additionally be included to show:

- Completed the capacity evaluation of electric utility provider and clearly state its suitability to act as the redundant electrical service for the site
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