

Appendix 9

OPERATIONS & MONITORING REPORT

Executive Summary

Four Lakes Task Force (FLTF), on behalf of Gladwin and Midland counties, has been designated as the delegated authority for the management of the dams and structures that form the Four Lakes system (system) located along the Tittabawassee River from Secord Dam, downstream to Sanford Dam. This report describes current and future anticipated operations and monitoring activities that FLTF needs to undertake to successfully create a quality operating company, one that strives for excellence in an environment of efficiency and constant improvement.

There are three key principles associated with excellent operations: 1) Safe operations for both the public and FLTF employees; 2) Regulatory compliant operations to meet public performance standards; and 3) Environmental excellence as stewards of the natural resources at hand. These principles form the path forward for FLTF in its operations of all four of the lakes within the system (Secord Lake, Smallwood Lake, Wixom Lake (Edenville Dam's impounded waters) and Sanford Lake).

The Operations & Monitoring Report details the transition from the time of facility purchase through the development of programs and initiatives that will form FLTF's future processes. It also includes information about its organizational structure and costs.

Table of Contents

Introduction

1. Transition to Present Operations
 - a) Boyce Hydro Staffing
 - b) Hydroelectric Facility Assessments
 - c) Establishment of a New Organization

2. Operations Development
 - a) Site Security
 - b) Spillway Operations
 - c) Winterization of Facilities
 - d) Public Safety Plan Development
 - e) Emergency Action Plan Development
 - f) Boat Barrier and Warning Signage
 - g) Emergency Generators
 - h) Regulatory Requirements
 - i) Environmental Health and Safety Program
 - j) Operations Support Services
 - k) Contractor Access and Safety
 - l) Strategic Use of Contractors
 - m) Monitoring Systems
 - n) Stream and Rainfall Gaging

3. Interim Operations & Monitoring Plan

- a) Operations Staffing
- b) 2021-2026 Budgets
- c) Environmental, Health and Safety
- d) Dam Safety Program
- e) Public Safety
- f) Compliance Management
- g) Operations and Maintenance
- h) Financial Responsibility
- i) Operations Support Services
- j) Public Interface
- k) Agency Relations
- l) Continuous Improvement

4. Future Operations

- a) Operations Staffing
- b) 2027-2037 Budgets
- c) General
- d) Land Management
- e) Monitoring

1. **Transition to Present Operations**

a. Boyce Hydro Staffing

The Boyce Hydro Operations Department consisted of one lead operator, one mechanic, and eight operators. The Operations Department's normal duties were to conduct the hydroelectric plant, spillway, dam, recreation and property management for all four federally licensed facilities. The Operations Department was supported by Boyce Operations office staff that included a corporate manager, a licensing/administrative person, a part-time engineer and a land surveyor who managed deeds for Boyce Hydro and other properties for the parent company.

b. Hydroelectric Facility Assessments

Boyce Hydro granted FLTF's project team (project team) access to the Four Lakes facilities during the week of October 13, 2020 to conduct facility asset condition assessments that included the powerhouses and their equipment, switchyards and interconnections to the power grid, concrete and earthen dams, spillways and spillway equipment and the Boyce Hydro office and grounds that are located just downstream of the Edenville Dam. Additional organizations participated in these operations-related assessments, including the Essex Partnership which was hired to provide strategic planning and operations expertise and Consumers Power operations representatives who shared their operating expertise with the project team. The project teams developed implementation schedules that identified priority work activities that needed to be completed to assure safe operations and facilities for the 2020-2021 winter and the 2021 spring season. Regular meetings regarding implementation plan progress have been held since the end of October 2020 resulting in significant task accomplishment.

c. Establishment of a New Organization

Brad Fedorchak, with 30 years of operations engineering and management experience, was hired into the Operations Manager position by FLTF to lead and develop the Operations Department. Brad and members of FLTF, conducted interviews that resulted in the hiring of Greg Uhl as the Operations Supervisor, and two operators to care for the dam-related facilities at the Four Lakes Projects. The number of needed positions was based on the determination that hydroelectric operations are not financially feasible due to poor future forecasted pricing for the electricity market. After the May 2020 flood (flood), the Secord and Smallwood project lake levels were significantly lowered per order of Federal Energy Regulatory Commission (FERC) until the dams are repaired and meet dam safety standards. The Edenville and Sanford dams have been breached, thereby eliminating the possibility of refilling the lakes in the short term, therefore, the current complement of operations staff will suffice until after the lakes have been refilled.

2. Initial Operations Development

a. Site Security

Project facilities are inherently dangerous to those who are untrained and unfamiliar with their features, operations and status. There are fall, inundation, electrical, confined spaces and other hazards that have been magnified by the current flood-damaged conditions at the facilities. New hazards exist due to the impoundments being dewatered, exposing bottomland sediments and creating river flows in areas that were recently lakes, as well as breached and scoured dam structures with unknown hazards. FLTF's goal has been to review such exposures and take steps to assess these hazards, minimize threats and warn others of the hazards. Warning signs, cameras, boat barriers and other items have been installed or upgraded for the benefit of the public and FLTF personnel.

b. Spillway Operations

In October 2020 engineers developed facility assessments that include a review of the structural stability of the water-retaining and conveyance structures at all four of the projects. The goal of the facility assessments was to ensure safe operations for the winter and spring, for the period of reconstruction, and beyond. For Secord and Sanford projects, lake levels have been lowered to the top of the spillway structure crests to minimize loading on the dams. All spillway gates at all four of the projects have been opened to their fullest extent and secured to ensure flood flows pass unabated through the spillway gate structures.

c. Winterization of Facilities

Wintertime presents many situations that could damage project facilities with service water piping freezing; penstocks icing; inability to move intake, spillway, or other gates due to icing; trash rack blockages and failures; controls equipment condensation; walking surfaces near fall potentials; etc. FLTF Operations worked with engineers to identify facility and personnel exposures and addressed them in several ways:

- Bracket mounted water movers were purchased and located near the intakes at Secord and Smallwood projects. Water movers are not needed at Edenville and Sanford dams.
- Contractors were hired to perform de-icing services along the Secord spillway to keep ice from forming on the concrete horizontal struts and water flowing unabated through the spillway gates and down to the downstream river segments. They also performed

deicing of the spillway operations deck for Operator walking safety. The contractors have been deployed at Secord and Smallwood projects, only.

- Station service power was reestablished at Secord through working with Consumers Power by reconnecting the station to the switchyard.
- The service power at Smallwood remained intact during and after the flood and therefore no work was needed to provide power for winter operations.
- The Edenville powerhouse is severely damaged, therefore, station service is not needed within the building at this time. Waterlines have been blocked.
- The Sanford switchyard was totally underwater during the flood and remains compromised. Station service power was re-established in cooperation with Consumers Power; a circuit from a street pole was added to power the electrical within the powerhouse so that it stays in good condition. There is some salvage value remaining with the hydraulic system, high voltage switchgear and control equipment.

d. Public Safety Plan Development

With the Four Lakes in various stages of dewatering, it was determined that Public Safety Plans needed to be developed to properly establish a system of warning signs, alert horns, facility lighting, boat barriers, etc. These plans have been created for all facilities and actions have been taken to improve public protections at the projects.

e. Emergency Action Plan Development

FLTF worked with Gladwin and Midland County Emergency Directors to create new Emergency Action Plans (EAP) for notifying the public of emergency conditions from abnormally high river flows, impending dam failures, or actual dam failures. The new EAPs are organized to give FLTF Operations personnel clear instructions for responding to emergency conditions at the site and provides additional needed information that they can refer to during emergency situations and for training purposes. The EAPs have been constructed to consider the current physical state of each of the four dams. EAP implementation drills will be conducted on an annual basis with agencies and other entities that would be key participants during actual emergencies. The EAPs will be updated on an annual basis. A more in-depth functional test of the EAPs will be done on a frequency as determined by FLTF, the two counties and Michigan Environment, Great Lakes and Energy (EGLE).

f. Boat Barrier and Warning Signage

Boat barriers have been designed and ordered for the Secord, Smallwood and Edenville projects. These buoy strings will be located upstream of intakes and spillways and are designed to alert power boaters and canoe/kayak users that dangerous conditions exist beyond their location and at the dam. Installation is expected to occur before July 2021. Additionally, FLTF has reviewed the "Dam Ahead" warning signs for proper letter sizing and readability as well as their associated lighting systems to provide for a higher degree of safety on the lakes. A review of other signage was conducted as part of the Public Safety Plan assessment. FLTF also notified the public in a news release of hazardous conditions that may exist in and around the bottomlands; the newly dewatered shoreline between the previous normal highwater mark and the edge of the lakes at the Secord and Smallwood projects and the river edges at the Edenville and Sanford projects. New project entrance signs that identify FLTF as managers of the county-owned facilities and

display an emergency contact number for the public to call should they have safety or environmental concerns will be implemented.

g. Emergency Generators

The need for backup power during this winter was important in that the harsh weather and planned power grid outages can cause freezing issues and damage equipment and operations of the facilities. FLTF Operations staff assessed the existing back-up generators and determined that they are approaching the end of their useful lives and need to be replaced in the near future. Pricing and availability of rental or new generators have been determined by operations staff.

h. Regulatory Requirements

Boyce Hydro was regulated by the FERC through its operating licenses that contained required compliance responsibilities, such as dam safety; environmental; recreation; cultural/historic; land management; operations; public stewardship; and other important resource areas. Many of these requirements that could be considered as best practices will be carried forward. The State of Michigan has its own set of requirements that stem from their regulations and their permitting of specific work activities. FLTF Operations staff is identifying all requirements so that it can remain in compliance.

i. Environmental, Health, and Safety Program

An Environmental, Health and Safety (EHS) professional was contracted to develop safety and environmental procedures for FLTF. A hazard assessment of the exposures that employees or contractors would encounter was done, leading to a list of priority procedures to be created and approved by Operations management. The effort focused on the hazards that are most prevalent and dangerous to the employees as well as administrative requirements that are needed to run a successful safety program. Key business behaviors related to personnel safety have been initiated, such as, periodic safety committee meetings; pre-job briefing standards; confined space entry procedures; lock-out tag-out protection procedures; fall protection procedures; and others.

j. Operations Support Services

As part of creating FLTF's Operating company, FLTF management has developed office management processes that include typical business elements like human resources, purchasing, accounts payable, accounts receivable, financing (including the Special Assessment District Program (SAD)); etc. These services are important to the "standing up" of FLTF Operation and to future operations.

k. Contractor Access & Safety

Operations staff have been and continue to be involved in assisting engineers and contractors in the performance of their winter/spring period design and construction work. Even though the project sites are not fully functional, the Operations staff provides needed safety boundary protection and monitors contractor activities to ensure the contractors are meeting their obligations. Staff also advises on or controls access to the construction sites and coordinates incident action plan aspects of their work.

I. Strategic use of Contractors

The use of contractors allows FLTF to meet peak work activity demands at a lower cost than it would have if FLTF had hired additional staff to complete the workload at hand (i.e., the use of contractors to provide services to free the Secord spillway of ice to protect structures to facilitate the passage of river flows through the spillway structure). FLTF did not add Operations staff to handle this peak assignment. Electrical and civil work has been contracted out instead of hiring electricians and construction personnel as regular FLTF employees.

m. Monitoring Systems

The use of technology to monitor river and lake conditions helps speed operator responses to changing river conditions and reduces the number of operators required to staff the Four Lakes facilities during the year. A Supervisory Control and Data Acquisition system (SCADA) has been designed with the intent to provide real-time and historical data to the dam operators, to provide site security, as well as important information pertaining to the maintenance of lake levels and to assist FLTF in its compliance with monitoring and reporting requirements as set by regulatory agencies (MI Department of Natural Resources, EGLE, etc.). The base design of the SCADA system provides for the following at each of the FLTF dams in real-time as well as a historical recording of data:

- Sanford Dam, Edenville Dam, Tobacco Dam (no impoundment) have:
 - A single pan/tilt/zoom camera and a staff gauge with the ability for the system to be expanded when water is impounded in the future.
 - A level instrument will be added at Tobacco to determine level and flow through the new spillway.
 - Each location has a power failure alarm.
- Secord Dam, Smallwood Dam (with an impoundment) have:
 - Four cameras
 - Upstream and downstream staff gages
 - Upstream dissolved oxygen and downstream dissolved oxygen
 - Upstream water temperature
 - Impoundment water level
 - Tailrace water level
 - Calculated flow through spillway gate openings based on water level
 - Power failure
 - Door entry alarm to powerhouse
 - Fire alarm powerhouse

SCADA project and electrical costs by project have been summarized below: (These costs do not include utilities and software licenses. The costs are included as part of the *recovery project* budget and not the Operations expense budget.)

Secord Dam	\$140,000
Smallwood Dam	\$140,000
Tobacco Dam	\$95,000
Edenville Dam	\$90,000
Sanford Dam	<u>\$90,000</u>
Total	\$555,000

n. Stream and Rainfall Gaging

FLTF has also worked with the Spicer Group Engineering, Inc., Essex Partnership, US Geographical Survey (USGS), National Weather Service and Gladwin and Midland County Emergency Management Directors to evaluate the need for additional river gaging to better inform those downstream of certain dam and waterway conditions, high flows and rising floodwaters. The first focus has been to arrange for streamflow gaging to service Midland, Michigan, however, FLTF Operations is seeking additional streamflow gaging to provide actual and predicted inflows to the Secord project. An assessment of potential additional rain gauges is being done to better identify the location and intensity of rainfall in the watershed. This effort is being coordinated with various entities, such as the counties, USGS and the National Weather Service's River Forecast Center. The goal is to provide FLTF Operators and emergency responders with sufficient advanced warning so the emergency responders can initiate evacuations, road closures and other needed actions.

The following locations are currently under contract with USGS by FLTF for gaging through 2024, at which time the value will be re-evaluated. The total cost of this three-year contract to FLTF is \$241,215 with USGS paying \$52,167.

- USGS streamflow gaging information in the northern regions of FLTF – best location was determined to be at Secord Dam Road
- USGS streamflow gaging information on Salt River
- USGS streamflow gaging information on the Chippewa River
- USGS streamflow gaging information on the Tittabawassee downstream of the Sanford Dam

3. Interim Operations & Monitoring

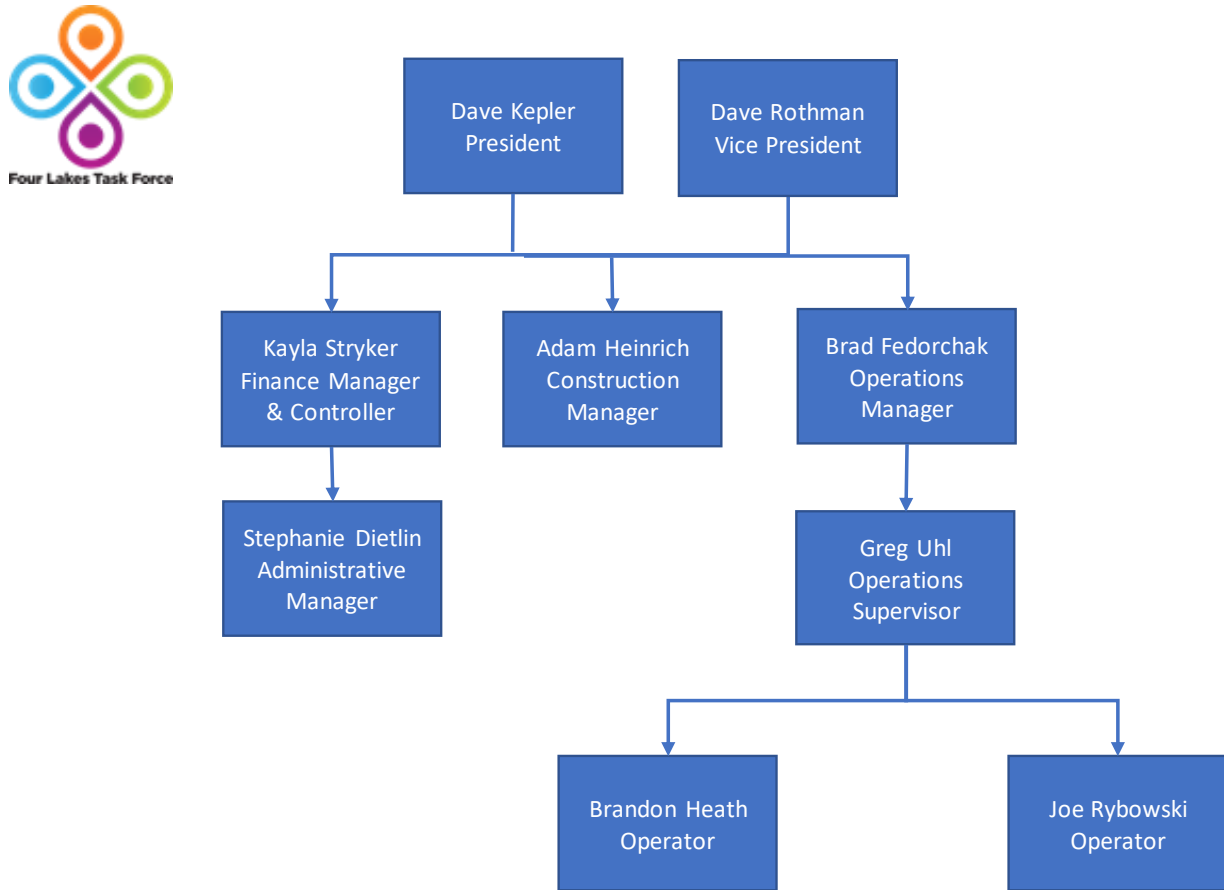
The interim operations period started with the purchase of the Four Lakes facilities by the Gladwin and Midland counties in December 2020 and ends with the refilling of each individual lake. Actions to be taken during this period have been included in the plans, schedules and costs delineated below. These work activities will be a part of the costs that would be spread across the SAD membership per the approved allocation process.

FLTF intends to use modern communications and technology to enable more efficient operations. FLTF has reviewed past operations and has moved forward with the development of technology-based systems to better manage its facilities and to drive down operating costs including operating labor and contractor costs.

a. Operations Staffing

The FLTF Operations Department does not see a need to hire additional people beyond its current complement of four people throughout the interim period. If a need for additional staff arises during the interim period, the situation will be evaluated by the FLTF management. Contractors may be hired to meet peak work needs; however, FLTF will minimize the use of contractors and will weigh alternatives before doing so.

Figure 1. Four Lakes Task Force operations staff flowchart



b. 2021-2026 Operating Budgets

The following chart shows the breakdown of budgeted costs for both the Program Office and the Operations Departments. These costs were escalated at just under 5% per year to account for expected payroll and benefit increases, other annual cost inflation, and for unknown contingencies with the new organization, FLTF, establishing new professional processes and programs. A three-year operating expense budget has been prepared to show the Operations & Monitoring cost escalations by department and year:

Figure 2. Estimated operations costs for 2021 through 2023

Item	Estimated Costs		
	2021	2022	2023
FLTF Lake/Dam Operations	\$1,214,884	\$963,018	\$990,545
Program Office	\$296,633	\$311,462	\$327,035
Operations	\$592,869	\$587,556	\$599,510
USGS Gages and Maintenance	\$325,382	\$64,000	\$64,000

Figure 3. FLTF 2021 budget breakdown for the program office and operations

PROGRAM OFFICE			OPERATIONS		
Items	Cost (\$)	Portion	Items	Cost (\$)	Portion
Finance & Admin.	135,229	46%	Labor	203,574	34%
Legal Expense	68,400	23%	Contract Labor	73,095	12%
Supplies	50,000	17%	Telecom & Utilities	48,700	8%
Insurance	10,000	3%	Insurance	44,500	8%
Taxes	1,035	0%	Vehicles & Equipment	62,000	10%
Business Consultant	5,000	2%	Consultants	100,000	17%
Contingency	26,999	9%	Supplies	61,000	10%
Total	296,663		Total	592,869	

c. Environmental, Health and Safety Program

The creation of an effective Environmental, Health and Safety (EHS) Program is the top priority for FLTF as it would be for any well-functioning company. Caring for the environment, the health of our employees and their safety is humanely and practically essential. Our contracted EHS Consultant has been and will continue to work with FLTF Operations staff to complete the development of the EHS Program, policies and procedures that are needed to ensure the safety of FLTF employees who work in areas that can have hazardous exposures. They will also identify specific safety-challenged areas and address them through the design of engineering controls. The EHS Program will be codified in policies and programs as well as its performance being tracked via a new Commitments Management System. Task orders will drive in-the-field audits as well as reviews that will ensure management involvement and continuous improvement of the program. The FLTF Operations Manager and Operations Supervisor will be responsible to help develop, implement and review the EHS Programs on a set frequency. The EHS Consultant will serve as an EHS advisor for specific situations that need clarification and program improvement, as requested. A training program and implementation plan will be developed during the interim period.

d. Dam Safety Program

FLTF and its consultant companies, The Essex Partnership and GEI Consultants, Inc., are supporting EGLE’s efforts to develop new engineering and dam safety regulations for dams in the state that will drive further development of the dam safety program. Though the regulations may be evolving, FLTF will establish its Dam Safety Program now to fill the void that will be created when the FERC Division of Dam Safety no longer claims jurisdiction of the Four Lakes dams. FLTF understands and appreciates the stewardship responsibilities it has for its dams and for running its operations in an excellent manner. Public safety is critical to everyone’s purposes and success.

Typical Dam Safety Program elements include emergency action plans and a dam safety training program.

- Emergency Action Plans set requirements for monitoring weather and site conditions so that public alerts and warnings can be made for safety’s sake. These plans have been modified to reflect new FLTF contact personnel and other changes that have occurred since the plans were last updated by Boyce Hydro (2018).

- A Dam Safety Training Program will be developed and implemented keeping compliant with EGLE's Dam Safety Program requirements; standards that are expected to be modeled after Federal Emergency Management Agent Dam Safety Program guidelines. Though the Operations staff has experience with dam safety inspections, FLTF will have a GEI-supplied designated Dam Safety Engineer (DSE) with support staff to serve as FLTF's dam safety experts for all facility structures. The DSE will design a dam safety training module for operations, tailoring it to the Four Lakes specific dams. The DSE will conduct the training and be available as a resource should any member of FLTF need information or advice about the safety of dam structures or other elements of the Dam Safety Program.

e. Public Safety

Public Safety Plans have been developed by FLTF. The installation of seasonal protective devices and signs will be part of the Operations Department's work routines. Operators will conduct normal inspection rounds to look for deficiencies that need correction. Specific task orders will be developed to initiate specific Public Safety Plan-related inspections. The Public Safety Plan will be reviewed on an annual basis.

f. Compliance Management

Compliance with regulations is required to ensure that public standards are incorporated in the processes that make up FLTF's organization. FLTF considers regulatory compliance a keystone to running its operations properly and will only accept excellent performance in this regard. To this end, FLTF is researching the use of a new Commitments Management System (CMS) that is proven, reasonably priced and flexible to ensure its operations and processes remain in compliance with federal, state, county and local requirements. This system will house and manage work activities associated with engineering, operations, maintenance, financial, human resources, payroll, benefits and other processes, as necessary. This system will present current and future compliance views that will be visible to the FLTF leadership team and will create reports that will aid managers in their oversight responsibilities.

g. Operations & Maintenance

The Four Lakes structures and facilities require frequent inspection by Operations staff. The structures are normally unmanned but are monitored via cameras that show powerhouse areas, spillways bays and downstream flow gaging equipment, as well as the overall area along the dam and forebay of each dam. The inspection purpose is to check that all structures and systems are intact and operating properly. If abnormalities are found, the operators will correct the situation on their own or they will communicate the facts of the situation to the Operations Supervisor. It may be that other operators need to assist or contractors need to be called in to assist FLTF Operations personnel. The Operations Manager and Supervisor are developing new Operating procedures to codify normal practices and expectations. The orderly conduct of operations is essential to the proper working of the four facilities. Operators are responsible for the proper operation of the spillway gates so that the lake levels are maintained at the prescribed values as indicated in the State of Michigan Part 307 regulation for the Four Lakes.

An Annual Maintenance Plan is being developed and will be entered into the Commitments Management System (CMS) to ensure proper and timely maintenance is carried out. A good maintenance plan will help FLTF keep its spillway gate equipment, structures, vehicles and other equipment in a good state of readiness so that operational expectations can be achieved. The following is a list of operations activities during the interim period:

<u>Operations Activities</u>	<u>Frequency</u>
Snowplow access roads & drives	10 times/year x 4 sites
De-ice spillway & operating decks	30 times/year x 2 sites
Inspect facilities daily, weekly, and monthly	As specified
Take dam interior phreatic readings & monitor	Monthly X 2 sites
Conduct facilities safety inspections	Weekly
Make general rounds and record operating data	Daily
Assist w/environmental studies	Infrequent
Review construction designs	12 times/year
Assist w/permitting	6 times/year
Test Alert Sirens	12 times/year x 1 site
Monitor recreation sites	Daily but seasonal
Perform regulatory requirements per permits	Weekly, on average
Implement EH&S employee programs	Daily with each job
Complete required employee training	Weekly

h. OPEX Financial Controls

FLTF management will oversee the budgeting/actual/variance analysis process that will also involve the Operations Manager and Operations Supervisor. Financial training on the budget will be given to the operators so that they understand and adhere to fiscal expectations and related procedures. The Operations Department is responsible for living within the allotted budget and notifying FLTF management if the Operations Manager anticipates the need to vary from the budget. FLTF has set up financial protocols to control expenditures through prescribed approval processes. Operational Expenditures (OPEX), costs for normal operations and maintenance activities, and Capital Expenditures (CAPEX) costs for the purchase of new property or major life extension projects, will be in separate budgets and accounted for separately.

i. Operations Support

The Operations Department is supported by business staff personnel who are responsible for human resources, accounting, financial, budget/variance analysis, purchasing/contracts, payroll, community relations, agency interactions, legal and public communication functions.

j. Public Interface

Throughout FLTF's involvement in its efforts to obtain the Four Lakes facilities from Boyce Hydro and now for the repair, reconstruct, and refill the lakes, it has been resolute in its pursuits on behalf of the public. A key indicator of FLTF's efforts is the quality of its communications with the public that have been open and transparent. FLTF Office and Operations staff will be expected to continue these positive communication traits and to work openly with stakeholders during all interactions.

k. Agency Relations

Similar to that of FLTF's public interface, FLTF has demonstrated unwavering support to work with agencies in an open and earnest manner. FLTF supports the interests of the agencies while striving to fairly assess the many competing facets that face the Four Lakes system. The Operations Department goal is to be 100% compliant with agency regulations and commitments. It is essential for the Operations Manager and Operations Supervisor to develop relationships

with key agency contacts so that good communications exist to promote mutual understanding, clarity of requirements and efficient situational resolutions.

I. Continuous Improvement

There are many facets to operations that will be managed as programs. These programs will be reviewed on a repetitive basis to promote efficiency throughout the organization. A typical continuous improvement cycle relies on establishing a program, setting performance metrics, reviewing performance, identify areas for improvement, change the program for the next cycle, then repeat the process again.

4. Future Operations

a. Operations Staffing

As stated in “3. Interim Operations & Monitoring” above, future Operations Department staffing will be reviewed for approval by FLTF management. Once the lakes have been refilled, additional operators may be hired due to new operations demands from operating demands of the new spillway equipment. However, legal and consultant costs are expected to be lower than the current six-year budget thereby offsetting the cost of the new operators.

b. 2027-2037 Budgets

The future Operations Expense budget is expected to keep pace with cost-of-living indices. Exceptions could include major maintenance items associated with the facilities. The repair and reconstruction of the dams is expected to give FLTF and the county facilities that are free from major maintenance expenses except for major inspections and care for the spillway gate equipment (10-to-20-year cycle) or other unforeseen work.

c. General

FLTF will continue to improve its effectiveness by stressing the performance of annual continuous improvement reviews for its processes. In the future, it is expected that the core programs that have been set up during the interim period will drive future excellence in how FLTF protects the safety and health of its employees, conducts safe operations for the protection of the public, maintains full compliance with regulatory standards, executes proper financial management protocols to keep costs low and establishes itself as a great steward of the Four Lakes projects.

d. Future Spillway Operations

Spillway gate operations at all four dams will be vastly improved once the reconstruction projects have been completed. The existing tainter gates (chain operated, bottom opening gates) will be replaced by hydraulically operated crest gates. Fully automatic hydraulically operated spillway gates are envisioned for the future. These gates will have gate position and operation controls that will need to be maintained by operations personnel. Each dam will also be equipped with auxiliary spillways to pass additional water during high flow events. The auxiliary spillways will be “passive” overflow structures that are ungated, do not require power, or require operator intervention. The passive design will ensure reliable spillway capacity during high flow events.

e. Monitoring

New spillway gates are intended as part of the refill construction projects. As part of their installation, it is necessary to install new Instruments that indicate spillway gate position so that the operators would be knowledgeable of the flows through each gate opening at all of the Four Lakes spillways. It is anticipated that FLTF would add instrumentation and cameras at Tobacco, Edenville and Sanford projects to match the instrumentation and camera systems that are being outfitted at Secord and Smallwood during the interim period.

SCADA project and electrical costs by project have been summarized below: These costs do not include utilities and software licenses. The costs are included as part of the recovery project budget and not the Operations Expense budget.

Secord Dam	\$30,000
Smallwood Dam	\$30,000
Tobacco Dam	\$85,000
Edenville Dam	\$90,000
Sanford Dam	<u>\$90,000</u>
Total	\$325,000