



Bureau of Reclamation

Tiber Marina Master Plan



May 2026

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3.0 Executive Summary

As a crucial step for future growth of the U.S. Bureau of Reclamation – Tiber Marina, the Bureau hired SEH-Slate JV, LLC to conduct a master plan review of the facility and develop a master plan. This planning effort establishes a long-term vision to modernize marina infrastructure, address shoreline and operational challenges, and enhance recreational access at one of Lake Elwell’s primary boating and camping destinations.

The master plan identifies critical improvements to aging and vulnerable facilities, particularly those impacted by ongoing bank erosion. The existing residence and concessionaire building, located near the eroding shoreline, are slated for demolition and replacement. A new approximately 3,000-square-foot concessionaire building is proposed at a safer, more resilient location within the site, designed to better serve marina users while supporting long-term operational needs.

Infrastructure upgrades are a core component of the plan and include a new water and sewer system to replace outdated utilities and support increased use. Electrical service upgrades within Liberty Loop will improve reliability and safety, while new and upgraded full-hookup campsites will enhance visitor comfort and expand camping opportunities. The plan also reimagines and enlarges the boater staging area to improve traffic flow, reduce congestion, and provide a safer and more efficient experience for both launching and retrieving vessels.

The cornerstone of the master plan is the addition of an additional lane to the existing boat ramp. This improvement directly addresses capacity limitations during peak-use periods, reduces wait times, and enhances overall safety by improving circulation and operational efficiency at the launch area. Together, these enhancements position Tiber Marina to accommodate growing recreational demand while improving resilience, user experience, and long-term sustainability for Lake Elwell and the surrounding region.

This document is a record of the team’s analysis, design, reviews, and final selection of the preferred masterplan. The teams’ efforts included the following tasks and reports:

1. The Existing Facility Condition Review at the Bureau of Reclamation's Tiber Marina was conducted on July 14 and 15, 2025, in coordination with the current concessionaire, Ru's Tiber Marina, to document and assess existing site conditions. The review included a comprehensive evaluation of buildings and structures such as sheds, vault toilets, pavilions, the residence, and concessionaire building, with consideration given to overall condition, functionality, and maintenance needs. Existing utilities were also reviewed, including electrical service, the water cistern, and septic systems, to evaluate capacity, operational status, and observable deficiencies. This effort established a baseline understanding of facility conditions to support continued operations, maintenance planning, and future improvements at the marina.
2. Facility Requirement Programming was conducted in which the current and future building space needs were assessed. This was a critical aspect of the project as it informed the team of the necessary requirements for the masterplan for optimal operation of the Tiber Marina.
3. Design Workshops were conducted with the Bureau of Reclamation, Tiber Marina Concessionaire and Tiber Marina users. In these meetings, the current and future needs of the marina property were discussed. It was also asked what was working, what could work better, and what wish list items that the staff and administration had. The following were some of the final goals and takeaways:
 - a. An additional lane at the boat ramp is needed to accommodate boat traffic getting on and off the lake.
 - b. The current potable water system is not sized adequately and requires its own treatment or larger cistern. Currently, potable water is required to be hauled to the site.
 - c. The sanitary septic system needs to be replaced.
 - d. The concessionaire building is from the 1950's and is at the end of its useful life.
 - e. The residence building is from the 1950's and is at the end of its useful life. It is also within thirteen feet of the eroding bank and is anticipated to fall into the lake with more erosion.

- f. The electrical system should be consolidated.
 - g. The existing fuel pump system and fuel storage needs to be replaced.
 - h. The boat and trailer parking lot are not organized and causes disruption and inefficiencies.
- 4. Program of Space Needs was developed. In this analysis, we determined that approximately 3,000 square feet of total building is needed to meet the future needs of the marina. Currently the marina has 2,400 square feet of space. This includes 1,007 square feet for the concessionaire building and 1,007 square feet for the provided residence. However, as was determined in the Facility Condition review, a number of these buildings need major work or need to be demolished.
- 5. Four (4) Preliminary Plans and cost estimates were developed to see how the space needs might be achieved:
 - a. Option 1: 1,500 Sq. Ft. Concessionaire Building & Utility Updates
 - b. Option 2: 3,000 Sq. Ft. Concessionaire Building w/ Bathhouse and Laundry
 - c. Option 3: 3,000 Sq. Ft. Concessionaire Building w/ Bathhouse and Laundry and 20% Campsite Increase
 - d. Option 4: Concessionaire & Residence Buildings w/ Bathhouse and Laundry & 50% Campsite Increase
- 6. We met with the Bureau of Reclamation and selected a Preferred Design Option to further develop. The Preferred Option was derived from Option #3 and included minor refinement based on review comments by the bureau and public.
 - a. The final option was updated with some of the comments that we received from the bureau including:
 - i. Consider orientation of campsites in Liberty Loop.
 - ii. Move the pad for the concessionaire residence behind the proposed concessionaire building for additional privacy.
- 7. A final Option of Probable Cost for the preferred options was then developed. A cost range was given, and it is anticipated that the full build out would range from \$7.8 Million to \$12.7 Million. While this cost is large it is important to note that the preferred option will allow for the work to be completed in Phases over time and would not require an all-in investment.

The SEH-Slate JV, LLC team is proud of the work that was developed and know this document will help the U.S. Bureau of Reclamation to put the communities tax money toward enduring facility developments.

4.0 Scoping Meeting

The following is a summary of the scoping meeting held on December 10, 2024 at Tiber Marina. Actual meeting minutes can be found in Appendix B.

The scoping meeting for the Bureau of Reclamation Tiber Marina Master Plan was held on December 10, 2024, at the Tiber Marina with representatives from SEH–Slate JV, the marina concessionaire, and the U.S. Bureau of Reclamation in attendance. The purpose of the meeting was to conduct required project scoping to support SEH–Slate JV’s proposal for preparation of a marina master plan and to establish a shared understanding of existing conditions, constraints, and long-term goals. The Bureau of Reclamation emphasized a desire for the project to ultimately be shovel-ready, while SEH–Slate JV clarified that the current scope of work is limited to master planning and that future design and construction efforts would follow the plan’s completion.

Discussion of existing conditions identified significant challenges, including active bank erosion threatening the store and residence, seasonal operations with winterization needs, shoreline mud at docks, ramps, and the swim beach, frequent wind and wave impacts, limited and constrained utilities (potable water, septic, and electrical), delivery access challenges due to gravel roads, inadequate truck, trailer, and boat storage, and high demand for camping and full hook-up RV sites. The group outlined a broad vision for the Master Plan that includes stabilizing erosion, improving internal circulation and parking, expanding utilities and electrical capacity, replacing outdated store, office, and residential structures, upgrading docks, ramps, and wave protection, improving day-use beach facilities, expanding camping, lodging, and cabin opportunities, enhancing boat and trailer storage and security, and evaluating additional recreational amenities to improve overall functionality, safety, and long-term viability of the marina.

5.0 Existing Conditions

The following is the existing conditions review of the existing buildings systems, and site.

5.1 Civil and Site

5.1.1 Overview



5.1.1.1 Total Site Area

5,750,000 SF | 132 acres

The Tiber Marina Campground site consists of approximately 132 acres of property in the immediate area of the campground. This does not include any water surface or other Bureau of Reclamation property around Lake Elwell. 64 acres of property is undeveloped and typically unused. According to the US Bureau of Reclamation website (<https://www.usbr.gov/gp/recreation/lerrec.html>), 68 acres are developed for public use. This aligns with the main campground area that was determined by the design team.

5.1.1.2 Utilized Area

2,962,000 SF | 68 acres

In general, most of the site is utilized for daily operations, infrastructure, and equipment and material storage. Negligible areas of the site are undeveloped and completely unutilized. However, due to the size of the area available for utilization, many areas are under-utilized or could be developed more efficiently with a smaller footprint.

Approximately 7 acres (305,100 SF) of the site are designated camping spots for camper trailers and RVs. 5.5 acres (246,307 SF) is public circulation space that includes the parking lot, secure boat/trailer storage, fish cleaning station and pavilion. The remaining 55.5 acres consist of access roads and open camping. These camping spots are not specifically designated and do not have utility hookups.

5.1.1.3 Unutilized Area

2,788,000 SF | 64 acres

There are 64 acres of the site that is significantly under-utilized. The under-utilized land is generally to the northern part of the property away from the water. This area is native grassland and would require significant site work to develop with the existing topography.

5.1.2 General Civil Analysis

5.1.2.1 Existing Conditions

The civil engineering assessment of Tiber Marina reveals a range of infrastructure and operational deficiencies related to site access, utility systems, drainage, and facility siting. The primary access routes consist of moderately maintained gravel roads, while internal circulation is characterized by a mix of formal gravel roads and informal two-track paths resulting from seasonal vehicle use. Inadequate and inconsistent signage, along with poorly defined boundaries, impedes effective wayfinding and traffic management. Additionally, drainage improvements are necessary to address erosion and washout risks, particularly in areas adjacent to building foundations and other sensitive locations. Site security is currently limited, relying primarily on manual swing barrier gates at key entry points, with recommendations to expand controlled access to seasonal or high-risk zones.

Several key facilities—including the residence, concession building, utility building, and RV dump station—are at or beyond the end of their service life, with some structures threatened by proximity to actively eroding banks. ADA accessibility across the site is inconsistent, with only partial compliance in parking and access routes, necessitating upgrades to meet current standards. The wastewater management system is limited to a single holding tank, lacking a permanent septic or drain field solution and insufficiently sized for future expansion. The assessment recommends a comprehensive modernization strategy, including integrated utility upgrades, relocation of at-risk structures, and implementation of a centralized, scalable wastewater treatment system. These improvements are essential to enhance infrastructure resilience, accessibility, drainage, and operational efficiency, thereby supporting both current operations and anticipated future growth.

5.1.2.2 Recommendations

The recommendations outlined for Tiber Marina's civil infrastructure advocate for a comprehensive modernization program to address facility obsolescence, enhance operational efficiency, and accommodate future expansion. Priority actions include

upgrading site access through the installation of improved wayfinding signage, delineators, and enhanced drainage systems to mitigate erosion and ensure reliable vehicular and pedestrian circulation. Security measures should be reinforced by expanding the deployment of manual barrier gates at seasonal or sensitive access points. Furthermore, all new and renovated facilities are to be strategically relocated away from actively eroding banks and designed to achieve full ADA accessibility, including compliant parking and accessible routes.

Utility systems are recommended for consolidation and significant upgrade, with a particular focus on transitioning from a single holding tank to a centralized, scalable septic system capable of integrating wastewater flows from all principal buildings and the RV dump station. Campsite infrastructure should be standardized with clearly defined boundaries, improved surfacing, and expanded utility provisions to serve a broader spectrum of users. Additional recommendations include upgrading electrical systems, replacing outdated equipment, and implementing a tiered service model for campsites. Collectively, these measures will improve safety, accessibility, and user experience, while establishing a resilient foundation for phased development and long-term sustainability of the marina.

5.1.3 Site Utility Infrastructure

5.1.3.1 Existing Water System

The current potable water system supplies both the residence and the concessionaire building through three (3) polyethylene cisterns located adjacent to the fish cleaning station. The combined storage capacity is estimated to range between 4,500 and 5,100 gallons. This variation is attributed to discrepancies between existing design plans and information provided by the concessionaire.

Potable water is delivered by water trucks approximately once per week during the operating season, with deliveries increasing to twice weekly during peak demand periods such as holidays. During the recent field inspection, algal growth was observed within the cisterns. The likely contributing factor is the translucent nature

of the cistern material, which allows sunlight penetration and promotes algae development.

Potable water is distributed to the residence and concessionaire building via a hydropneumatic pumping system to maintain adequate pressure.

Non-Potable Water Supply

Non-potable water is sourced directly from the lake and utilized exclusively for irrigation purposes.

5.1.3.2 Recommendations

Increase Potable Water Storage Capacity. Install additional cisterns or replace existing units with larger-capacity tanks with a targeted storage volume of 8,000 – 10,000 gallons to reduce trucking frequency. Consideration should be made for modular tank systems for scalability and management of water age.

Improve Water Quality. Replace translucent cisterns with opaque or UV-resistant tanks. Installation of tank covers or shading structures where replacement is not feasible.

- Implement chlorination or UV disinfection systems for microbiological control.
- Schedule routine cleaning and inspection before and after the operating season.

Optimize System Reliability. Verify hydropneumatic pump sizing for increased storage capacity. The system would benefit from the addition of redundant pumping units or backup power supply for operational continuity.

Optional Recommendation: Potable Water Well. The objective is to provide a sustainable water source and eliminate reliance on trucking.

Actions:

- Conduct hydrogeologic study to confirm groundwater availability and quality.
- Install well with proper casing and sanitary seal to prevent contamination.
- Integrate treatment systems to address potential water quality issues:
 - Iron, manganese, hardness: Filtration or softening.
 - Microbiological contaminants: Chlorination or UV disinfection.
 - Nitrates or chemical contaminants: Reverse osmosis or specialized treatment.
- Implement regular water quality testing per regulatory requirements.

5.1.4 Site Access – Entrances

5.1.4.1 Existing Conditions

Access to the Tiber Marina is from Tiber Marina Road, which is a moderately to well-maintained gravel road that intersects with Tiber Road approximately 3 miles northeast. A secondary access to the marina is located approximately 0.25-miles to the west of the main entrance, along a similarly moderately-maintained gravel road.

Interior roadway systems within the marina area vary from well-maintained gravel to informal two-track roads from seasonal vehicle use.

5.1.4.2 Recommendations

Access to site would mostly benefit from upgraded wayfinding signage that defines clear and consistent direction throughout the marina. Additionally, use of delineators such as timbers, boulders, or delineator posts to discourage or restrict access to sensitive areas during wet seasons or low-use periods.

Provisions for drainage enhancements should be considered such as installation or improvements of roadside ditches and culverts to prevent erosion and washouts during seasonal runoff.

5.1.5 Site Security

5.1.5.1 Existing Conditions

Site security for the marina is limited. The only restricted areas known for the study area are at the main entrance area into the camping area known as Hilltop Loop.

The three entry points to this area have manual swing barrier gates typically used at public land entry points to control vehicular access, especially in seasonal or restricted areas.

5.1.5.2 Recommendations

Since Tiber Marina is public land, full restriction to the area is not feasible.

Recommendations would be to provide additional manual swing barrier gates at defined access to areas that are primarily seasonal and pose the greatest risk of uncontrolled use.

All facilities should be fitted with secured entry.

5.1.6 Residence Building

5.1.6.1 Existing Conditions

Parking is provided adjacent to residence. ADA compliant grades are provided without compliant surface parking material that leads to accessible routes.

Accessible route is not ADA compliant and leads to non-compliant access into residence.

Landscaping is provided around and up to the foundation of residence. Generally, the grades adjacent to residence are shallow. Visually, it cannot be determined if adequate positive drainage from the foundation is provided. The rear of the residence is precariously close to the top bank that is eroding rapidly.

5.1.6.2 Recommendations

The residence building, while at the end of its useful life, is also within thirteen feet of the eroding bank of the lake. The building is in imminent danger of collapsing into the lake and should be demolished.

Relocation Justification: Due to the proximity of the existing structure to an actively eroding bank, the new facility should be sited further inland on more stable ground. This relocation will mitigate long-term geotechnical risks and reduce the potential for structural undermining due to continued shoreline erosion.

Parking and Access Routes: The new site design should include:

- A fully compliant accessible route with appropriate slope, cross-slope, surface material, and width.
- Accessible parking stalls with compliant signage, striping, and access aisles at the new building location.

Site Grading and Drainage

- Foundation Drainage: Confirm continuous positive drainage from the foundation. The new building site should be:
 - Graded to ensure minimum 5% slope away from the foundation for at least 10 feet, or as required by local code.
 - Designed with foundation drains or swales to manage surface runoff and prevent water intrusion.
- Landscaping Considerations: Landscaping should be set back from the foundation to allow for proper drainage and maintenance access. Use of native, drought-tolerant vegetation is recommended to reduce irrigation needs and erosion potential.

5.1.7 Concession Building

5.1.7.1 Existing Conditions

ADA-compliant parking is provided adjacent to the concession building. An accessible route between residence and concession is provided. However, it is not considered fully ADA compliant.

Landscaping is provided around and up to the foundation of the concessionaire building. Generally, the grades adjacent to residence are shallow. Visually, it cannot be determined if adequate positive drainage from the foundation is provided entirely

around the perimeter of the building. The rear of the building is situated further from the top of the bank of the lake than the residence but may also be at risk if the erosion of the bank is not addressed.

5.1.7.2 Recommendations

The existing concessionaire building, while currently functional due to recent interior finish and HVAC upgrades, has reached the end of its effective service life. Based on structural aging, site constraints, and evolving operational needs, it is recommended that the building be decommissioned and replaced with a new facility designed to meet current and future programmatic requirements.

Relocation Justification: Due to the proximity of the existing structure to an actively eroding bank, the new facility should be sited further inland on more stable ground. This relocation will mitigate long-term geotechnical risks and reduce the potential for structural undermining due to continued shoreline erosion.

Parking and Access Routes: The new site design should include:

- A fully compliant accessible route with appropriate slope, cross-slope, surface material, and width.
- Accessible parking stalls with compliant signage, striping, and access aisles at the new building location.

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- Foundation Drainage: Confirm continuous positive drainage from the foundation. The new building site should be:
 - Graded to ensure minimum 5% slope away from the foundation for at least 10 feet, or as required by local code.
 - Designed with foundation drains or swales to manage surface runoff and prevent water intrusion.
- Landscaping Considerations: Landscaping should be set back from the foundation to allow for proper drainage and maintenance access. Use of native,

drought-tolerant vegetation is recommended to reduce irrigation needs and erosion potential.

5.1.8 Utility Building

5.1.8.1 Existing Conditions

ADA-compliant accessibility is generally provided to the building via a concrete ramp to access doors. The site surrounding the building is gravel with shallow slopes away from the structure.

The building serves as the water system booster pumphouse and maintenance equipment storage. The building is situated near the residence and concessionaire building providing a centralized and efficient location for staff and operators.

5.1.8.2 Recommendations

It is recommended that utility building be relocated to a centralized point once all utility systems, such as water booster pumps, storage, treatment and onsite wastewater treatment systems have been integrated to serve a single point for controls and management of system.

5.1.9 Fuel Storage Tank

5.1.9.1 Existing Conditions

The existing fuel storage at the marina has been found to be out of compliance, and as such a new 3,000-gallon steel storage tank has been purchased and is sitting on-site.

5.1.9.2 Recommendations

Identify the preferred location of the new fueling station location based on operational needs and environmental guidelines. Install in accordance with local, state and federal regulations

5.1.10 Pre-Cast Concrete Vault Toilets

5.1.10.1 Existing Conditions

The pre-cast vault toilets provided at the marina area are considered to have adequate ADA accessibility via accessible routes from the ADA compliant parking areas. The one exception being the two located near the concessionaire building provide an ADA accessible landing at the entrance to the facility, but users must park adjacent to facility and traverse gravel parking area.

Orientation of vault toilets with standpipes has the standpipes situated on the southern side of the facility which allows for most efficient ventilation of gases.

5.1.10.2 Recommendations

Recommendations related to pre-cast vault toilets is to provide ADA compliant parking and accessible routes between facilities and congregated areas of additional facilities are planned. Install in accordance with manufacturer's recommendations.

5.1.11 RV Dump Station

5.1.11.1 Existing Conditions

A single-point discharge location for recreational vehicle (RV) waste is situated at the apparent low elevation of the full hook-up RV sites, adjacent to the southwest corner of the boat storage area. The positioning of this facility does not support queuing for multiple RVs or camper trailers, which may lead to suboptimal traffic flow and operational inefficiencies during peak usage periods.

Construction documentation detailing the plumbing configuration and operational design of the dump station is not available. It is presumed that the RV discharge point is integrated with the full hook-up sanitary sewer system and ultimately conveys waste to the holding tank located near the marina residence. The discharge inlet is protected by a threaded sanitary sewer clean-out plug. However, no spill containment is recognizable. Additionally, a yard hydrant equipped with a garden hose is provided to facilitate rinse-down procedures.

5.1.11.2 Recommendations

Site Placement Improvements

- **Relocate or Expand the Dump Station Area:** Consider relocating the dump station to a more centralized or accessible location within the RV park that allows for better traffic circulation and queuing.
- **Dedicated Access Lane:** Introduce a one-way access lane with clear signage and delineations to streamline traffic flow and reduce congestion during peak hours.

Capacity Enhancements

- **Install Multiple Dump Points:** Add one or more additional discharge inlets to accommodate simultaneous use by multiple RVs, reducing wait times and improving throughput.
- **Separate Holding Tank or Combined Septic Leach Field:** Evaluate the required capacity of existing dump system and future capacity needs. Consider the benefits of a dedicated holding tank versus integrating with a larger system-wide sanitary system based on RV Dump siting.

Operational Improvements

- **Standardize Plumbing Infrastructure:** Conduct a site survey to document existing plumbing and ensure compliance with sanitary codes. Replace the clean-out plug with a purpose-built RV dump inlet featuring a secure, gasketed cap and backflow prevention.
- **Enhanced Rinse Facilities:** Upgrade the rinse station with a dedicated non-potable water supply, hose reel, and signage to prevent cross-contamination.
- **User Guidance and Signage:** Install clear instructional signage for proper use, including rinse procedures, waste disposal etiquette, and emergency contact information.
- **Environmental Safeguards:** Include spill containment measures such as a concrete pad with perimeter curbing and a drain connected to a containment sump.

5.1.12 Septic Tank and Drain Field

5.1.12.1 Existing Conditions

No documentation is available confirming the presence of a septic tank or subsurface drain field serving the residence, concessionaire building, or RV dump station. A site assessment revealed no visible indicators of an on-site wastewater treatment system. Based on staff interviews, it is understood that a single holding tank—of undetermined capacity—is located west of the residence within an area designated for vehicle parking. Provided information indicates that the tank is pumped at least once annually, with primary usage concentrated during the four-month operational period of the marina concession facilities.

5.1.12.2 Recommendations

Infrastructure and Operational Enhancements

- **Replace Holding Tank:** Transition from single holding tank to permanent septic system with appropriate treatment and dispersal components.
- **Consolidated Wastewater Management Strategy:** Integrate all wastewater sources (residence, concession building, RV dump station) into a centralized OWTS designed for combined peak flows.
- **Install Monitoring Systems:** Use smart sensors for tank level monitoring, predictive maintenance, and remote alerts to prevent overflows.

Future Expansion Considerations

- **Design for Scalability:** Plan infrastructure to accommodate additional RV sites, public restrooms, showers, and laundry facilities.
- **Modular System Design:** Use parallel tank configurations and segmented drain fields to allow for phased expansion.
- **Regulatory Context:** Consider Montana DEQ Circular DEQ-4 sets the minimum design standards for subsurface wastewater treatment systems. These standards apply to individual, shared, and public systems, including those serving RV parks, concession buildings, and residences. Wastewater systems serving 25 or more

people per day, or 15 or more connections are considered public systems and must be designed by a Montana-licensed professional engineer. Local health boards (e.g., Liberty County) must adopt regulations no less stringent than DEQ standards and are responsible for permitting and inspections

5.1.13 Recreation Shelter (Pavilion)

5.1.13.1 Existing Conditions

The recreational shelter (pavilion) is situated in the centralized point of the ramp loop. The recreational shelter can be accessed from two ADA compliant parking areas with concrete accessible routes and is considered to meet ADA accessibility requirements.

No formal parking is provided for the facility, and accessibility by other users may be accomplished by traversing shallow grades of native vegetation.

The recreational shelter is characterized by a concrete slab with structural covering with picnic tables, a fire pit on the exterior, and electrical service.

5.1.13.2 Recommendations

It is recommended that formal parking and wayfinding signage that defines clear and consistent direction of access and use of facility be provided. The use of delineators such as timbers, boulders, or delineator posts to discourage or restrict access to sensitive areas during wet seasons or low-use periods.

Additionally, defined accessible routes, such as gravel or concrete trails, should be provided from other facilities at marina to provide connectivity to this community gathering area.

5.1.14 Fish Cleaning Station

5.1.14.1 Existing Conditions

The fish cleaning station is situated on a reinforced concrete pad and sheltered by a four-post metal roof structure. An ADA-compliant concrete parking area is provided adjacent to the station, with a fully accessible concrete sidewalk connecting the

parking area to the fish cleaning facility. The station is located near a gravel access road and associated parking lot, facilitating vehicular and pedestrian access.

While the fish cleaning station remains structurally functional, several mechanical components are currently inoperative. According to input from Bureau of Reclamation personnel and marina staff, the grinder pumps and secondary dosing tank pumps are non-functional. As a result, the wet wells and associated tanks require frequent manual pumping to maintain operational capacity. Additionally, the absorption fields serving the station are reported to be dry due to no effluent being currently pumped to the field.

5.1.14.2 Recommendations

System Rehabilitation and Component Replacement

- **Replace Non-Operational Pumps:** Install new grinder pumps and secondary dosing tank pumps with sufficient capacity to handle peak seasonal loads. Select models with corrosion-resistant materials and integrated alarms for failure detection.
- **Inspect and Restore Wet Wells and Tanks:** Clean and inspect all wet wells and tanks for structural integrity. Apply protective coatings if necessary and ensure watertight seals to prevent infiltration or exfiltration.
- **Upgrade Electrical and Control Systems:** Integrate automated controls with telemetry for remote monitoring, pump cycling, and fault alerts to reduce manual intervention.
- **ADA Accessibility:** Maintain ADA-compliant access to the fish cleaning station and associated infrastructure, including parking, pathways, and operational controls.

5.1.15 Concrete Boat Launch Ramp

5.1.15.1 Existing Conditions

The existing concrete boat ramp is a single-lane structure measuring approximately 16 feet in width and extending a total length of 335 feet. At the lower terminus of the ramp, a 35-foot dog-leg extension facilitates access to deeper water, enhancing usability during varying water levels. The entire ramp surface is ribbed to improve traction for vehicles and trailers during launch and retrieval operations. The concrete ramp thickness has not been verified, and the material condition is assessed to be fair to moderate.

A bypass access route is located to the south of the main ramp, allowing mid-point entry approximately 150 feet from the ramp crest. This route enables boaters to launch without staging in the primary parking area and is situated just above the high-water elevation.

The ramp is equipped with a floating dock system intended primarily for boat launching, with access provided from both sides. The dock is less than 50 feet in length and features attachment components that do not meet current ADA accessibility standards. The dock system is manually repositioned in response to fluctuating water levels.

Adjacent to the primary dock is a portable courtesy dock outfitted with ADA-compliant ramp attachments. However, an accessible route connecting the courtesy dock to the main facility is not currently provided, limiting full ADA compliance.

5.1.15.2 Recommendations

Ramp Expansion and Reconfiguration

Widen the Ramp: Expand the existing ramp to a dual-lane configuration (minimum 32 ft wide) to accommodate simultaneous launching and retrieval of multiple boats or watercrafts.

Extend the Ramp: Lengthen the ramp further into deeper water to reduce reliance on the dog-leg and improve usability during low water conditions.

Determine and Standardize Thickness: Conduct geotechnical and structural assessments to determine existing ramp thickness and ensure future extensions meet load-bearing requirements.

Dock System Enhancements

Install Modular Floating Docks: Replace or retrofit the existing dock system with modular, ADA-compliant floating docks that can be easily adjusted for water level fluctuations.

Increase Dock Length and Capacity: Extend dock length beyond 50 ft and consider adding parallel docks to support multiple users simultaneously.

Upgrade Anchoring and Access Points: Use adjustable anchoring systems and gangways with compliant slopes and handrails to maintain ADA access regardless of water level.

ADA Compliance and Accessibility

Construct Accessible Routes: Install paved, ADA-compliant pathways from parking and staging areas to all dock systems, including the courtesy dock.

Install ADA Launch Features: Consider adding specialized launch equipment such as transfer systems or boat slides for users with mobility impairments.

Provide Signage and Wayfinding: Include clear, visible signage indicating accessible routes, dock locations, and water level adjustments.

Circulation and Staging Improvements

Redesign Bypass Route: Formalize and pave the southern bypass route with clear signage and striping to improve mid-point access and reduce congestion at the main staging area.

Add Turnaround and Staging Zones: Incorporate designated turnaround areas and pre-launch staging zones to streamline traffic flow and reduce wait times.

5.1.16 Campsites

5.1.16.1 Existing Conditions

Varies campsite types and services exist at the marina. The are defined as such:

- Hilltop Loop: Approximately eleven (11) campsites with electrical hookups. Two of which are characterized as ADA compliant with a concrete pad and

accessibility to the ADA compliant vault toilet. Each site has a picnic table and fire pit. Access to sites is via a moderately maintained gravel roadway

Adjacent to the campsites in this area are two (2) prefabricated cabins that are not set on foundations but rather set on a concrete pad. Access to these cabins is considered to be ADA accessible.

- Liberty Loop: Approximately nine (9) campsites with no hook-ups. Each site has a picnic table and fire pit. Access to sites is via a moderately maintained gravel roadway.
- Full Hook-ups: Six (6) full hookups with water/sewer/electric are situated north of the concessionaire and residential building and adjacent to that the boat storage area. Access is via a moderately maintained gravel road and are back-in types.
- Dry Camping/Seasonal Areas:
 - Dry camping and tent camping have been observed in the area between the wind break tree line and Tiber Marina Road. Access is accomplished from Tiber Marina Road. A shallow roadside ditch must be traversed to access sites.
 - Seasonal and additional dry camping of indeterminate capacity occurs throughout the remainder of the subject study area of the marina. These are characterized by day camping and groups sites. Not defined areas are readily delineated or signed. Access to sites are via moderately maintained defined gravel roads and Interior roadway systems within the marina area and informal two-track roads from seasonal vehicle use.

5.1.16.2 Recommendations

The existing campground infrastructure at Tiber Marina offers a diverse range of site types and services, but lacks consistency in layout, access, and operational clarity. To improve overall functionality, user experience, and long-term sustainability, it is recommended that the marina implement a comprehensive campground modernization and management strategy. This strategy should focus on:

Site Standardization and Infrastructure Upgrades

- Formalize and clearly delineate all campsite types (e.g., dry camping, electric-only, full hook-up) with consistent surfacing, signage, and boundaries.
- Improve access to roads and internal circulation through grading, drainage enhancements, and surface stabilization.
- Expand utility services where it is feasible to increase the number of full hook-up and ADA-compliant sites.

Capacity Expansion and Tiered Service Offerings

- Introduce a tiered service model to accommodate a range of users—from tent campers to large RVs—with scalable amenities such as showers, laundry, and group sites.

Operational Management and User Experience

- Enhance wayfinding and traffic flow with standardized signage, site numbering, and directional markers.
- Develop a seasonal maintenance and monitoring plan to ensure consistent upkeep and safety.

Accessibility and Compliance

- Ensure all new and upgraded facilities meet ADA standards, including accessible routes, parking, and amenities.
- Expand ADA-compliant features across all loops and cabins to improve inclusivity.

Environmental and Site Protection

- Stabilize areas at risk of erosion and implement drainage controls to protect infrastructure.
- Use native landscaping and low-impact design principles to preserve the natural character of the site while improving functionality.

5.2 Residence Building

5.2.1 Overview

5.2.1.1 Year Built

1956 (estimated)

5.2.1.2 Building Area

1,007 SF

5.2.1.3 Staff/Personnel Capacity Current and Needs

Current Staff: n/a

Needs: n/a



Residence Building - Exterior



Residence Building - Exterior



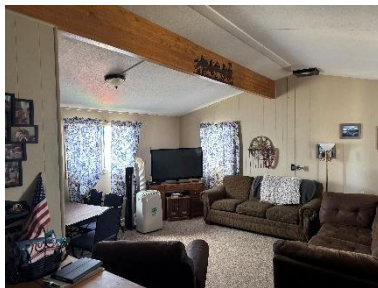
Residence Building - Exterior

5.2.2 Architectural

5.2.2.1 Existing Conditions

- Interior flooring type is a mix of sheet vinyl or linoleum and carpet. The flooring seemed to be in ok condition but should be replaced.
- Windows types vary between wood, vinyl and aluminum in poor condition. All of the windows need to be replaced.
- Construction type is wood stick framing with interior walls appearing to be 2 1/2" studs. The building is a modular structure that was placed on site.
- The insulation R-value of the exterior walls and roof could not be verified but it is assumed to be inadequate.
- Interior doors types are wood doors and are in good condition.
- The bathroom is linoleum sheet flooring with a shower. It does not meet ADA Accessibility requirements and should be updated.

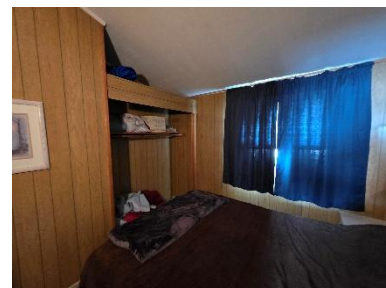
- There is no designated ADA parking spot for the residence.
- Exterior ingress/egress sidewalk to the residence does not meet ADA Accessibility requirements and should be replaced.
- Exterior siding is of cedar board and batten type at the end of its useful life and should be replaced
- Roofing type is exposed fastener delta rib metal panel. The roof and fascia are in poor condition and should be replaced.
- Overall, the residence building is at the end of its useful life and should be demolished.



Residence Building - Interior



Residence Building - Interior



Residence Building - Interior

5.2.2.2 Recommendations

The residence building, while at the end of its useful life, is also within thirteen feet (13'-0") of the eroding bank of the lake. The building is in imminent danger of collapsing into the lake and should be demolished. It is recommended that a new residence be constructed in a different location that meets ADA Accessibility requirements to accommodate any and all concessionaires. Although it is a private residence for the concessionaire, it is a government provided building and should allow for ADA Accessibility needs.

5.2.3 Structural

5.2.3.1 Existing Conditions

- Existing structures appears to be a prefabricated building supported on a cast-in-place concrete crawlspace foundation. The structure was reportedly constructed on site at the time of construction of the Tiber Dam.
- Crawlspace with cast-in-place perimeter concrete wall

- Floor joist spanning between concrete wall and interior wood beams supported on irregularly spaced steel and wood posts without footings
- 2x4 stud framed walls
- 2x6 roof joists

5.2.3.2 Recommendations

Structure is in fair condition but has been modified over time and is threatened by bluff erosion. Building could be maintained in its current condition with regular maintenance, but significant capital spending on structure is not advised.

5.2.4 Mechanical

5.2.4.1 Existing Conditions

- The residence building is assumed to have originally been equipped with an electric forced-air furnace, which is typical of manufactured homes of this era. While no furnace unit or active ductwork was clearly visible during the site visit, it is likely that a ducted trunk line exists beneath the floor, even if the system is no longer in service.
- The building does not have a central air conditioning system. A portable air conditioning unit was observed in the living room, providing localized cooling. The bedrooms rely on portable fans for air circulation, indicating that no cooling system is installed beyond occupant-supplied equipment.
- Overall, the home has functional central heat but no central cooling. Cooling capacity is minimal and dependent on portable devices, which likely results in reduced comfort during warmer months.

5.2.4.2 Recommendations

The existing central electric forced-air furnace should continue to be maintained to ensure safe and reliable operation. Given the age of the building, ductwork should be inspected to confirm it is intact, properly sealed, and free of leaks or blockages. If the residence is intended for year-round use, consideration could be given to adding a

central cooling solution, such as a heat pump or ductless mini-split system, to improve comfort and reduce reliance on portable appliances.

Portable air conditioning units and fans currently provide limited cooling, which may be insufficient during periods of high occupancy or hot weather. Long-term planning should include evaluation of efficient cooling strategies that can be integrated with the existing central heating system.

5.2.5 Plumbing

5.2.5.1 Existing Conditions

- The plumbing system consists of typical residential fixtures, including a kitchen sink, a bathroom lavatory, a toilet, and a tub/shower combination. Fixtures are dated but appear functional. The tub/shower surround shows staining and wear consistent with long-term use.
- Hot water is available, though a dedicated water heater was not observed during the site visit. The concessionaire did not report any issues with water supply or hot water availability within the residence.
- No water treatment, softening, or filtration equipment was observed. The plumbing system appears to be adequate for residential needs, with no reported deficiencies at the time of the visit.

5.2.5.2 Recommendations

Although hot water is available in the residence, no water heater was observed during the site visit. The type, age, and capacity of the existing hot water system should be confirmed to ensure it is adequately sized for residential use.

While no issues with water supply were reported by the concessionaire, the plumbing fixtures are dated and should be evaluated for potential replacement with modern, water-efficient units to improve performance and reduce long-term maintenance needs.

5.2.6 Electrical

5.2.6.1 Existing Conditions

- The existing electrical service to the Residence is provided by an exterior-mounted panelboard on the northeast side of the building. The electric utility meter is mounted adjacent to the service panelboard. Service conductors appear to be routed underground from the utility transformer located between the Utility Building and the Residence. The Residence electrical distribution system is 120/240V single-phase, with the panelboard protected by a 200A main circuit breaker that also serves as the service disconnect.
- The panelboard is in poor condition. The front cover is unsecured due to broken hinges, and no visible voltage or amperage ratings are provided. Most of the existing circuit breakers do not comply with current electrical code requirements, as the AIC ratings are not identified.
- Lighting within the Residence varies in fixture style and type. The fixtures are assumed to utilize compact fluorescent lamps. The concessionaire did not report any lighting issues. No automatic lighting controls were observed during the site visit.
- Overall, the electrical distribution system for the Residence is in poor condition. The service panelboard should be replaced, and circuit breakers upgraded to meet current code requirements. Given the age of the Residence, additional code deficiencies within the electrical system are also likely.



5.2.6.2 Recommendations

The electrical panelboard should be replaced, and new circuit breakers installed if the building is expected to remain in use for the foreseeable future. Circuit breakers with AFCI, GFCI, or dual-function protection will be required in accordance with

current residential electrical code requirements. At the time of replacement, the service conductors between the utility transformer and the panelboard should also be inspected to determine whether they are in good condition for reuse or should be replaced.

5.2.7 Low Voltage/Security

5.2.7.1 Existing Conditions

- The Residence contains limited low voltage systems consistent with manufactured housing construction. Existing systems generally include telephone/data cabling, television coaxial cabling, and doorbell wiring. Low voltage cabling is typically surface-mounted or routed within the trailer's accessible cavities (underside chaseways, attic space, or wall cavities).
- Telecommunication and television service enter the Residence at a single point on the exterior, then distribute to wall outlets via non-plenum-rated coaxial or Category 3/5 cabling. System pathways are informal and may not follow structured cabling standards.
- No centralized low voltage panel or structured cabling enclosure was observed.
- No security systems, intercoms, or advanced home automation systems were observed.

5.2.7.2 Recommendations

The existing low voltage systems should be evaluated for replacement or upgrade to meet current performance and safety standards. Any outdated telephone or data cabling (e.g., Category 3) should be replaced with Category 6 or better structured cabling to support modern communication and network needs. Coaxial cabling should be replaced where damaged or where routing is noncompliant with current standards.

5.3 Concession Building

5.3.1 Overview

5.3.1.1 Year Built

1956 (estimated)

5.3.1.2 Building Area

1,007 SF

5.3.1.3 Staff/Personnel Capacity Current and Needs

Current Staff: 2

Needs: 1-2



Concession Building - Exterior



Concession Building - Exterior



Concession Building - Exterior

5.3.2 Architectural

5.3.2.1 Existing Conditions

- Interior flooring type is Laminate throughout the building and is in good condition.
- Windows types vary between wood, vinyl and aluminum in poor condition. All of the windows need to be replaced.
- Construction type is wood stick framing with interior walls appearing to be 2 1/2" studs. The building is a modular structure that was placed on site.
- Interior doors types are wood or fiberglass doors and are in good condition.
- There are two separate bathrooms designated as 'Men's' and 'Women's', both with one toilet, sink and shower. The floor area is adequate to meet ADA requirements, but several components are out of compliance.
 - An 18" vertical grab bar needs to be added to both bathrooms at the toilet locations.

- The showers need ADA compliant seats
- The men's sink is set too low and does not meet wheelchair knee clearance.
- The food prep kitchen includes a triple sink but does not have an open floor sink for drainage.
- There is a designated ADA parking spot that allows for an accessible entrance to the building via a ramp.
- Exterior ingress/egress ramp to the concessionaire's building does meet ADA Accessibility requirements.
- Exterior siding is of cedar board and batten type at the end of its useful life and should be replaced
- Roofing type is exposed fastener delta rib metal panel. The roof and fascia are in poor condition and should be replaced.
- Overall, the concessionaire building is at the end of its useful life and should be demolished.



Concession Building - Interior



Concession Building - Interior



Concession Building - Interior

5.3.2.2 Recommendations

The concessionaire building is at the end of its useful life but is still functional with recent interior renovations to the finishes and HVAC system. It is still recommended that the building be demolished, and a new concessionaire building be constructed that meets the programmatic needs of day-to-day operations. It is also recommended that the building be relocated to a different site on the property due to the proximity of the continuously eroding bank.

5.3.3 Structural

5.3.3.1 Existing Conditions

- Existing structures appears to be a prefabricated building supported on a cast-in-place concrete crawlspace foundation. The structure was reportedly constructed on site at the time of construction of the Tiber Dam. Several modifications have been made including an ADA accessible front entrance on the west side, a covered porch and open deck on the east side.
- Crawlspace with cast-in-place perimeter concrete wall
- Floor joist spanning between concrete wall and interior wood beams supported on irregularly spaced steel and wood posts without footings
- 2x4 stud framed walls
- 2x6 roof joists
- Covered porch and deck appear to have been constructed and modified over time and are not in compliance with current structural building code requirements.

5.3.3.2 Recommendations

The primary structure and front porch are both in fair condition and no significant deterioration affecting the original structural capacity. However, it has been modified over time and is threatened by bluff erosion. The covered porch and deck are both in poor condition with some areas of deteriorated wood, prior modifications that appear to have removed structural supports and floor and roof members have spans in excess of allowable capacity per current building code. Building could be maintained in its current condition with regular maintenance, but significant capital spending on structure is not advised.

5.3.4 Mechanical

5.3.4.1 Existing Conditions

- The Concession Building is served by a relatively new split HVAC system, reportedly installed in 2022. The system consists of a packaged outdoor condensing unit located on the north side of the building and a RUUD indoor air handling unit (model RH1T3617STANJA) mounted above the restroom corridor. Conditioned air is

distributed through sheet metal ductwork routed through the retail and seating areas.

- Additional comfort heating is supplemented by electric baseboard heaters, which are installed in the restrooms.
- The dining porch area is not conditioned or heated. The space relies solely on natural ventilation through operable windows and doors.
- Overall, the HVAC system appears to be in good condition and provides effective heating and cooling to the main concession and retail areas, with the exception of the porch dining space which remains unconditioned.

5.3.4.2 Recommendations

The split HVAC system, installed in 2022, appears to be in good condition and should continue to be maintained on a routine service schedule. Filter changes, seasonal inspections, and manufacturer-recommended maintenance should be implemented to maximize efficiency and equipment life.

The dining porch area remains unconditioned. If year-round use is desired, the addition of heating or cooling solutions—such as infrared heaters, mini-split systems, or other supplemental conditioning equipment—should be evaluated.

Restroom baseboard heaters should also be inspected to confirm safe operation and adequate freeze protection.

5.3.5 Plumbing

5.3.5.1 Existing Conditions

- The Concession Building is served by a cistern domestic water distribution system supplying plumbing fixtures throughout the building, including the kitchen, restrooms, and janitorial areas. A Bradford White electric storage water heater (model RE350S6), rated for 50 gallons and 240V single-phase service, provides hot water. The water heater appears to be in fair condition but is undersized for current demand. The concessionaire noted that hot water runs out when customers use the showers, indicating that a larger-capacity water heater is likely needed to meet usage requirements.

- Kitchen plumbing fixtures include a double-basin stainless steel sink with a gooseneck faucet, as well as a large triple-compartment stainless steel sink with a pre-rinse spray assembly located in the food preparation and dishwashing area. Additional plumbing is provided for equipment such as the ice machine and beverage service.
- Restroom facilities include wall-mounted sinks, tank-type toilets, and shower stalls. Fixtures appear to be modern and in good working order. Janitorial service is supported by a mop sink located in a dedicated closet.
- The water supply and drainage systems appear functional overall, with no major deficiencies noted during the site visit. Fixture types and layouts are typical for concession, restroom, and light food preparation use.

5.3.5.2 Recommendations

The existing 50-gallon electric water heater should be replaced with a larger-capacity unit or a commercial-grade water heating system to address hot water shortages reported during peak use, particularly when showers are in service. Options may include installing a higher-capacity storage tank, a multiple-unit system, or a hybrid tank/tankless arrangement sized to meet simultaneous kitchen, restroom, and shower demand.

All kitchen, restroom, and janitorial fixtures should be reviewed for compliance with current code and commercial standards. While most fixtures appear serviceable, the tank-type toilets and residential-style shower stalls may not provide the durability expected for high-traffic public facilities. Consideration should be given to upgrading to commercial-grade fixtures and adding floor drains where practical to support sanitation.

5.3.6 Electrical

5.3.6.1 Existing Conditions

- The existing electrical service to the Concession Building is provided by exterior-mounted service entrance equipment. This equipment consists of two electrical cabinets, a current transformer (CT) cabinet, and a utility meter located on the

northeast side of the building between the Residence and the Concession Building. Service conductors appear to be routed from the utility transformer situated between the Utility Building and the Residence. The Concession Building electrical distribution system could not be fully verified during the site visit but is assumed to be 120/240V single-phase. The main service disconnect ampacity was not determined; however, due to the presence of the CT cabinet, the service ampacity is assumed to be 400A.

- It is believed there are at least two panelboards associated with the Concession Building's electrical service. The first is likely one of the two exterior electrical cabinets, although the specific circuits it serves are unknown. The second panelboard is located inside the Concession Building and is a Square D QO load center with no visible voltage or amperage ratings. Approximately half of the existing circuit breakers do not comply with current electrical code requirements, as the AIC ratings are not identified. The interior panel is at both ampacity and space capacity, based on discussions with the concessionaire, and multiple tandem breakers were observed.
- Lighting within the Concession Building primarily consists of surface-mounted fluorescent tube fixtures. No automatic lighting controls were observed during the site visit.
- Overall, the electrical distribution system for the Concession Building is in poor condition. The service entrance equipment should be inspected to confirm the exact electrical connections and circuitry. The interior panelboard should be upgraded to provide additional ampacity and space capacity. Non-compliant breakers should be replaced with breakers meeting current code requirements. Given the age of the Concession Building, additional electrical code deficiencies are also likely present.



5.3.6.2 Recommendations

It is recommended that the Concession Building electrical system be upgraded to address capacity limitations, non-code compliant equipment, and overall system condition. The service entrance equipment should be evaluated by a licensed electrician to verify service capacity and confirm proper connections between the CT cabinet, exterior cabinets, and distribution equipment. The interior Square D QO load center should be replaced with a new panelboard sized to accommodate both current and future electrical loads, with adequate circuit space to eliminate the need for tandem breakers. All circuit breakers should be replaced with units that meet current AIC rating requirements and applicable electrical codes. In addition, the lighting system should be modernized with energy-efficient fixtures and automatic controls to meet current energy code standards.

5.3.7 Low Voltage/Security

5.3.7.1 Existing Conditions

- The Concession Building is not equipped with a dedicated low voltage distribution system. Based on the site visit, there is no structured cabling infrastructure in place for data, voice, or security systems. Telecommunications cabling appears to be limited to ad hoc wiring, with no visible cable management, patch panels, or termination hardware. The building does not contain a designated telecommunications room or enclosure.
- No access control or intrusion detection systems were identified during the site visit. Similarly, no audiovisual infrastructure was observed, and there does not appear to be any conduit or cable tray pathways to support future low voltage system installations.

- Overall, the low voltage infrastructure for the Concession Building is minimal and does not meet modern standards for telecommunications, life safety, or security systems. The lack of structured cabling and support spaces will require significant upgrades to accommodate current technology and code requirements.

5.3.7.2 Recommendations

The existing low voltage systems should be evaluated for replacement or upgrade to meet current safety and performance standards. New Category 6 structured cabling should be installed to support data and communication needs, with proper terminations and pathways provided. A code-compliant fire alarm system, including control panel, notification devices, and detection equipment, should be added or upgraded as required. Exit signage and emergency lighting should be provided with LED fixtures that include battery backup to meet current code. Provisions for access control and security systems should also be included to improve building safety.

5.4 Utility Building

5.4.1 Overview

5.4.1.1 Year Built

N/A

5.4.1.2 Building Area

390 SF

5.4.1.3 Staff/Personnel Capacity Current and Needs

Current Staff: n/a

Needs: n/a



Utility Building - Exterior



Utility Building - Exterior



Utility Building - Exterior

5.4.2 Architectural

5.4.2.1 Existing Conditions

- Interior flooring is unsealed concrete
- Windows types are aluminum frame and are at the end of their useful life and should be replaced.
- The double door into the building is hollow metal with a knock-down hollow metal frame. Both are at the end of useful life and should be replaced.
- Construction type is standard wood framing.
- Access to the Utility Building is not ADA accessible and determined this is acceptable.
- Exterior siding is of cedar board and batten type and condition
- Roofing type is exposed fastener delta rib metal panel. It is at the end of its useful life and be replaced.

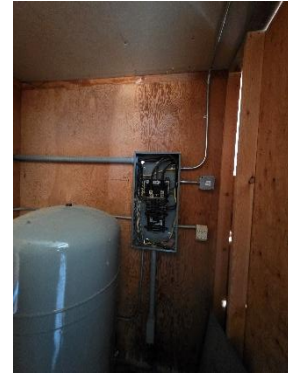
- Overall, the Utility Building is being used as a pump house and storage. There are concerns regarding the lean-to roof to the east and it's structural capacity. The building is at the end of its useful life and should be demolished.



Utility Building - Interior



Utility Building - Interior



Utility Building - Interior

5.4.2.2 Recommendations

It is recommended that the a new pump house/room be constructed in a centralized location if/when other utilities are upgraded for the site.

5.4.3 Structural

5.4.3.1 Existing Conditions

- Existing structure is a wood framed with 2x4 walls and rafters supported on a CIP concrete slab. A “lean-to” is constructed off the north side consisting of 2x4 joists that are nailed to the rafter tails of the primary building and supported on a 2x4 wall at the north. The joists are short segments that are spliced to extend the length.
- Cast-in-place slab on grade
- 2x4 wall framing
- 2x4 rafters

5.4.3.2 Recommendations

The original structure is in fair condition with no significant deterioration. The lean-to has primary structural members that are undersized, spliced inappropriately and/or lack proper connections to other structural elements. The lean-to does not

appear to have been built to building code requirements and should be demolished or reconstructed.

5.4.4 Mechanical

5.4.4.1 Existing Conditions

- Mechanical systems within the Utility Building are minimal. A baseboard-style electric heater is installed to provide freeze protection for the pressure tank and associated piping. No ventilation equipment or cooling systems were observed, and the building relies on natural infiltration for air exchange.

5.4.4.2 Recommendations

The electric baseboard heater should be inspected for safe operation and replaced if it no longer functions as intended. Additional freeze protection measures, such as heat tape or improved insulation around the pressure tank and piping, should be considered to reduce risk of system damage during winter conditions. If water system operations are critical year-round, the addition of a small mechanical ventilation system with thermostatic control may improve reliability and extend the life of equipment.

5.4.5 Plumbing

5.4.5.1 Existing Conditions

- The plumbing systems within the Utility Building appear to be limited to irrigation and water system support. A pressure tank and associated piping are present, consistent with a booster pumphouse configuration. The equipment suggests that the building plays a role in distributing water to various areas of the site, though detailed piping diagrams and system routing were not available. Some of the exposed piping shows signs of age, with evidence of corrosion and makeshift repairs. No domestic plumbing fixtures such as sinks, toilets, or lavatories were observed inside the building.

5.4.5.2 Recommendations

The plumbing system should be evaluated to confirm the condition and capacity of the pressure tank, distribution piping, and irrigation connections. Given the age and visible wear of the piping, replacement of corroded components and the addition of proper supports and protective insulation are recommended. A full survey of the water distribution network should be conducted to document system routing and ensure that it is meeting current and future demand. Backflow prevention should be verified at irrigation connections to comply with code requirements.

5.4.6 Electrical

5.4.6.1 Existing Conditions

- The existing electrical service to the Utility Building is provided by an exterior-mounted panelboard on the north side of the building, with the electric utility meter mounted adjacent to the service panel. Service conductors appear to be routed underground from the utility transformer located between the Utility Building and the Residence. The Utility Building electrical distribution system is 120/240V single-phase, with the panelboard protected by two (2) 200A main circuit breakers that serve as the service disconnects. It appears that one of the 200A breakers protects a panelboard located inside the Utility Building, while the other serves the full hook-up RV sites northwest of the Utility Building.
- The exterior panelboard is in good condition. The interior panelboard, however, is in poor condition. The front cover has been removed, leaving conductors, bussing, and terminals exposed and creating an electrical hazard. Approximately half of the existing circuit breakers do not comply with current electrical code requirements, as their AIC ratings are not identified.
- Lighting within the Utility Building is provided by bulb socket outlets, with fixtures that appear to utilize compact fluorescent lamps. No automatic lighting controls were observed during the site visit.
- Overall, the electrical distribution system for the Utility Building is in poor condition downstream of the exterior panelboard. The interior panelboard should be replaced, and all circuit breakers upgraded to meet current code

requirements. Given the age of the Utility Building, additional code deficiencies within the electrical system are also likely present.



5.4.6.2 Recommendations

The Utility Building electrical system should be upgraded to improve safety and compliance. The interior panelboard should be replaced with a new code-compliant unit, and all circuit breakers should be replaced with breakers that meet current AIC rating requirements. The exposed conductors and bussing should be properly enclosed to eliminate electrical hazards. The lighting should be upgraded with modern, energy-efficient fixtures and automatic controls to meet current code standards. A full evaluation of the electrical system is recommended to identify and address any additional code deficiencies.

5.4.7 Low Voltage/Security

5.4.7.1 Existing Conditions

- No low voltage systems were observed at the Utility Building.

5.4.7.2 Recommendations

None

5.5 Pre-Cast Concrete Vault Toilets

5.5.1 Overview

Multiple pre-cast concrete vault toilets are located on the campground property. Two vault toilets near the concessionaire building and parking lot are the oldest and are referenced below for this report. The other vault toilets are newer and are in good working condition.

5.5.1.1 Year Built

N/A

5.5.1.2 Building Area

42 SF/EA.

5.5.1.3 Staff/Personnel Capacity Current and Needs

Current Staff: N/A

Needs: N/A



Vault Toilet - Exterior



Vault Toilet - Exterior



Vault Toilet - Exterior

5.5.2 Architectural

5.5.2.1 Existing Conditions

- Painted concrete
- Precast concrete vault toilets with exposed aggregate exterior finish in fair condition.
- Doors are hollow metal in fair condition.
- Access to the toilets does not meet ADA.
- There is no ADA parking or access sidewalk near the vault toilets.

- Concrete pads at the entrance doors are separated from the vault structure and have a rise of more than one half inch at the threshold taking it out of ADA compliance.
- The roof is precast concrete
- The two vault toilets near the concessionaire building and parking lot are in working condition but lack ADA Accessibility. Due to their age and general wear and tear, they are at the end of their useful life.



Vault Toilet - Interior



Vault Toilet - Interior



Vault Toilet - Interior

5.5.2.2 Recommendations

It is recommended that the vault toilets be replaced and/or relocated pending the final master plan layout that is decided. The new location should provide ADA accessible access through a connected sidewalk and ADA parking.

5.5.3 Structural

5.5.3.1 Existing Conditions

- Precast vault toilets of (3) styles were observed around the site. Buildings are prefabricated structures that include a below grade tank and are placed on site.
- Pre-cast concrete vault
- Pre-cast concrete walls
- Pre-cast concrete slab roof

5.5.3.2 Recommendations

Typically, the structures are in good condition with minimal cracking and should continue regular maintenance. Sealing of existing fine cracks in concrete walls to reduce risk of future deterioration is recommended.

5.5.4 Mechanical

5.5.4.1 Existing Conditions

- The vault toilets do not include any mechanical systems. Ventilation is provided passively through vent stacks and does not rely on powered fans or other mechanical equipment. No pumps, HVAC equipment, or mechanical odor control systems are present.

5.5.4.2 Recommendations

None

5.5.5 Plumbing

5.5.5.1 Existing Conditions

- The vault toilets on site operate without conventional plumbing and rely on underground sealed vault tanks for sanitary waste storage. No potable water service is provided to these facilities. Waste is deposited directly into the vault tanks located beneath the toilet risers, and the tanks are periodically pumped out. The vault tanks are presumed to be precast concrete or fiberglass construction and are intended to remain watertight.

5.5.5.2 Recommendations

The vault toilets should be inspected to confirm the structural condition and watertight integrity of the underground vault tanks. Any tanks showing signs of deterioration, cracking, or leakage should be repaired or replaced to maintain sanitary operation. Vent stacks should be reviewed to ensure they are unobstructed, properly screened, and securely fastened to maintain adequate odor control and ventilation.

Hand sanitizer dispensers should be regularly maintained and replaced as needed. If future improvements are considered, the addition of a potable water source with handwashing fixtures could be evaluated to improve user hygiene.

Routine pumping and cleaning schedules should be continued, with records maintained to track service frequency and ensure compliance with health and environmental requirements.

5.5.6 Electrical

5.5.6.1 Existing Conditions

- The Vault Toilets do not have associated electrical services.
- Solar powered lighting is provided in the two Vault Toilets closest to the Concession Building.

5.5.6.2 Recommendations

None

5.5.7 Low Voltage/Security

5.5.7.1 Existing Conditions

- No low voltage systems were observed in the Vault Toilets.

5.5.7.2 Recommendations

None

5.6 Campsites

5.6.1 Overview

Twenty-four (24) existing campsites were identified in the campground with most campers set up as “dry camping” and not at a designated campsite. The campsites being reviewed in this report are established on the property and are either electrical hook up only (18) or full hook ups with electrical and water capabilities (6).

5.6.1.1 Year Built

N/A

5.6.1.2 Area

Individual Campsite: varies

Total Campsite (24): varies

5.6.1.3 Staff/Personnel Capacity Current and Needs

Current Staff: N/A

Needs: N/A



Campsites



Campsites



Campsites

5.6.2 Architectural

5.6.2.1 Existing Conditions

- Ten (10) campsites are in the designated “Hill Top” location with two spots designated as ADA. The ADA Accessible campsites have concrete pads and accessible sidewalks to a vault toilet. The remaining campsites are pull through with gravel pads. These are electrical hook-up only.

- Eight (8) campsites are in the designated “Liberty Loop” location with gravel pull out areas set up as pull through with gravel pads. These are electrical hook-up only.
- Six (6) campsites are located east of the current secure boat and trailer storage area near the concessionaire building. These are full hook-up sites. Campers/RVs are backed into these sites.
- Each established site is set up with a fire pit and picnic table. The campsites are well established and easily accessible with campers/RVs being pull-through type. Bollards are located to protect the electrical hook-up equipment. Overall, the campsites are in good shape but may lack proper power supply. See the electrical analysis below.

5.6.2.2 Recommendations

The Hill Top loop are recently established campsites compared to Liberty Loop and are in good condition. Liberty Loop are older established campsites and are spaced far apart. It is recommended that a higher density of campsites can be established in this area. With that, the electrical service would need to be upgraded. See the electrical analysis below.

5.6.3 Structural

5.6.3.1 Existing Conditions

Not applicable

5.6.3.2 Recommendations

Not applicable

5.6.4 Mechanical

5.6.4.1 Existing Conditions

- No mechanical systems are associated with the campsites.

5.6.4.2 Recommendations

None

5.6.5 Plumbing

5.6.5.1 Existing Conditions

- Potable water service is available in the Full Hook-up Area; however, it is not provided through the same pedestals as the electrical service. The exact location of the water connection points was not immediately clear during the site visit, and the routing and material of the underground piping could not be confirmed. It is presumed that the system conveys wastewater from the Full Hook-up Area to the holding tank near the marina residence, but construction documentation was not available to verify this configuration.
- No potable water connections were observed at Hilltop Loop or Liberty Loop. RV pedestals at these sites are limited to electrical service only. No dump risers or sewer connections were identified within the two loops.
- Freeze protection methods, such as insulation or heat tape, were not evident at the Full Hook-up Area pedestals. It is presumed that seasonal shutoff and drain-down procedures are used to prevent freeze damage.

5.6.5.2 Recommendations

The Full Hook-up Area water service should be further evaluated to confirm routing, connection points, and system capacity. A detailed survey of the underground piping is recommended to verify material type, condition, and discharge routing to the holding tank near the marina residence. Backflow prevention devices should be installed at all water connection points to comply with current plumbing code requirements. Freeze protection measures, such as insulated risers or heat tape, should be considered if year-round operation is required.

Liberty Loop and Hilltop Loop currently provide no water or sewer service at the pedestals. If future improvements are planned, consideration should be given to extending potable water and sanitary connections to these sites to enhance user convenience and operational consistency across the campground.

5.6.6 Electrical

5.6.6.1 Existing Conditions

- The campsite locations on site are referred to as Liberty Loop, Hilltop Loop, and Full Hook-ups area by the concessionaire. Hilltop Loop is located nearest the marina entrance on the west side of the entrance road. Liberty Loop is located south of Hilltop Loop on the east side of the entrance road. Full Hook-up Area is located just northwest of the Utility Building.
- Hilltop Loop appears to have a dedicated utility transformer with service equipment installed directly adjacent and mounted on a Unistrut support. The service equipment consists of an electric utility meter, a CT cabinet, and three (3) 200A service disconnect switches. The exact routing of the electrical distribution downstream of the service disconnects is unknown, as existing surveys were conducted prior to the installation of this equipment.
 - The service entrance equipment at Hilltop Loop is in good overall condition. However, the concessionaire reported nuisance tripping at the RV pedestals. It is unclear at this time why the tripping is occurring or if it consistently affects the same circuits.
 - There are ten (10) RV connection pedestals located on Hilltop Loop, with one additional pedestal providing power to two (2) sleeping cabins. Each pedestal includes a 20A, a 30A, and a 50A circuit breaker protecting a single receptacle of each rating. The pedestals at Hilltop Loop appear to be in good overall condition.



- Liberty Loop also appears to have a dedicated utility transformer with service equipment installed nearby and mounted on a Unistrut support. The service

equipment consists of an electric utility meter, a CT cabinet, and two locked electrical enclosures. The service disconnect was not located during the site visit and may be inside one, or both, of the locked enclosures. The routing of the distribution system downstream of the service equipment is unknown, as existing surveys were conducted prior to the installation of this equipment.

- The service entrance equipment at Liberty Loop is in good overall condition. The concessionaire noted that there are no nuisance tripping issues known to occur on Liberty Loop.
- There are nine (9) RV connection pedestals located on Liberty Loop. Each pedestal includes a 20A, a 30A, and a 50A circuit breaker protecting a single receptacle of each rating. The pedestals at Liberty Loop are in fair overall condition and are older and in slightly worse condition than those located on Hilltop Loop.



The Full Hook-up Area is believed to be powered by the existing electrical service equipment mounted on the north side of the Utility Building.

Six (6) full hook-up sites exist on the site in this area. The RV pedestals in this area appear newer and in slightly better condition than the pedestals in either of the loops mentioned previously. Each pedestal contains a 20A, a 30A, and a 50A circuit breaker protecting a single receptacle of the same rating.



5.6.6.2 Recommendations

The electrical systems serving both Hilltop Loop and Liberty Loop should be further evaluated to confirm service capacity, equipment configuration, and distribution routing. At Hilltop Loop, the nuisance tripping at the RV pedestals should be investigated to determine whether the issue is related to faulty breakers, wiring, or load imbalances. Any defective equipment should be replaced with new, code-compliant components.

The RV pedestals at both loops should be replaced or upgraded as needed to ensure long-term reliability and compliance with current standards. Priority should be given to the older Liberty Loop pedestals, which are in worse condition than those at Hilltop Loop. All pedestal breakers should be verified for proper ratings, and receptacles should be upgraded where required.

Overall, improvements to the campsite electrical systems will enhance safety, reduce maintenance issues, and provide more reliable service to users.

5.6.7 Low Voltage/Security

5.6.7.1 Existing Conditions

- No low voltage systems were observed at the campsites.

5.6.7.2 Recommendations

None

5.7 RV Dump Station

5.7.1 Overview

5.7.1.1 Year Built

N/A

5.7.1.2 Area

N/A

5.7.1.3 Staff/Personnel Capacity Current and Needs

Current Staff: NA

Needs: NA



Dump Station

5.7.2 Architectural

5.7.2.1 Existing Conditions

- Boulders and concrete curbing surrounding the dump station to protect it from traffic.
- Wood fence in fair condition to provide screening.
- The RV dump station is in fair condition and usable. There isn't a concrete pad that the drain is set in so cleaning maintenance could be problematic.

5.7.2.2 Recommendations

Relocate the RV dump station to tie into the new sanitary septic system with the location determined by the new site layout. Provide a concrete pad that slopes to the dump station sanitary drain for easy maintenance.

5.7.3 Structural

5.7.3.1 Existing Conditions

Not applicable

5.7.3.2 Recommendations

Not applicable

5.7.4 Mechanical

5.7.4.1 Existing Conditions

- No mechanical systems were observed at the RV dump station. The system appears to rely on gravity conveyance to the holding tank near the marina residence. No pumps, control panels, or alarms were identified during the site visit.

5.7.4.2 Recommendations

If the dump station discharge continues to rely on gravity conveyance, the condition of the downstream holding tank and piping should be verified for structural integrity and adequate capacity. If effluent pumping is required, properly sized pumps, controls, and alarms should be installed or upgraded to ensure reliable operation.

5.7.5 Plumbing

5.7.5.1 Existing Conditions

- The RV dump station consists of a single sanitary sewer riser with a threaded clean-out plug, located near the southwest corner of the boat storage area at the low point of the full hook-up RV sites. Construction documentation was not available, but it is presumed that the discharge inlet connects to the full hook-up sanitary sewer

system and conveys waste to the holding tank near the marina residence. No secondary spill containment or curbing was observed around the inlet.

- A yard hydrant with a garden hose is installed adjacent to the dump inlet for rinse-down purposes. The hydrant is identified as non-potable water by posted signage, but no backflow prevention device was observed at the connection.

5.7.5.2 Recommendations

The RV dump station should be upgraded to improve safety, sanitation, and functionality. The discharge inlet should be reconstructed with proper spill containment and surface grading to reduce the risk of wastewater pooling. Installation of a secondary containment apron with durable, cleanable surfaces is recommended. The existing yard hydrant should be replaced or retrofitted with a clearly identified non-potable water fixture equipped with a backflow prevention device to comply with current health and plumbing code requirements. Consideration should also be given to providing a dedicated potable water fill point at a safe separation distance from the dump inlet.

5.7.6 Electrical

5.7.6.1 Existing Conditions

- No electrical systems were observed associated with the RV Dump Station.

5.7.6.2 Recommendations

None

5.7.7 Low Voltage/Security

5.7.7.1 Existing Conditions

- No low voltage systems were observed associated with the RV Dump Station.

5.7.7.2 Recommendations

None

5.8 Recreation Pavilion

5.8.1 Overview

5.8.1.1 Year Built

N/A

5.8.1.2 Building Area

1,248 SF

5.8.1.3 Staff/Personnel Capacity Current and Needs

Current Staff: NA

Needs: NA



Pavilion - Exterior



Pavilion - Exterior



Pavilion - Exterior

5.8.2 Architectural

5.8.2.1 Existing Conditions

- The pavilion is placed on a concrete slab on grade.
- Construction type is steel columns and beams with wood tongue and groove for the roof.
- Part of the pavilion is enclosed with 5/8" sheathing to provide shelter/screening. The sheathing is in poor condition and should be replaced.
- Exposed fastener metal roof panel is in poor condition and should be replaced.
- Fascia metal and flashing is missing.
- The pavilion is generally in good condition and serves its purpose for shelter and a gathering space for campers and lake users.



Pavilion - Interior



Pavilion - Interior



Pavilion - Fascia

5.8.2.2 Recommendations

It is recommended that the metal roof panels and fascia be replaced. During removal, any observed damage or wood rot should be repaired as necessary. The exterior sheathing should be replaced and protected with a weather-resistant barrier and metal panels to improve durability, extend service life, and reduce ongoing maintenance requirements. Prior to undertaking any major repairs or replacement work, the building should be evaluated by a licensed structural engineer. All work should be completed in accordance with the structural engineer's recommendations.

5.8.3 Structural

5.8.3.1 Existing Conditions

- The Pavilion structure has (7) steel frame consisting of 6x6 HSS steel columns supporting 10x6 HSS steel beams on a concrete slab. Frames are spaced at 8 ft. on center with 5/4 Tongue and Groove boards spanning between the frames. Frames have been modified to add plywood panels to function as a wind screen around (3) sides on the southern half of the structure.
- Cast-in-place slab on grade
- 6x6 HSS Steel Column
- 6x10 HSS Steel Beams
- 5/4 T&G Deck Board Roof
- Plywood panels have been added to span between side posts
- 2x2 HSS vertical posts have been added to span from slab to beam at south end and supporting plywood wind screen panels

5.8.3.2 Recommendations

The original structure appears to be in good condition, however the plywood windscreen and supporting 2x2 HSS posts appear to have been added without an engineered design. The structure should be evaluated for wind loads which may lead to a need to strengthen frames and/or remove wind screen panels.

5.8.4 Mechanical

5.8.4.1 Existing Conditions

- No mechanical systems were observed associated with the Recreation Pavilion.

5.8.4.2 Recommendations

None

5.8.5 Plumbing

5.8.5.1 Existing Conditions

- No plumbing systems were observed associated with the Recreation Pavilion.

5.8.5.2 Recommendations

None

5.8.6 Electrical

5.8.6.1 Existing Conditions

- The existing electrical service to the Recreation Pavilion is provided by a pedestal located at the northeast corner of the pavilion. It is believed this pedestal is powered from the service equipment at the Concession Building and does not have a separate utility meter.
- The pedestal does not contain a main circuit breaker and has no visible voltage or ampacity ratings. It contains three branch circuit breakers that appear to serve convenience receptacles, pavilion lighting, and one (1) 30A RV receptacle. One of the breakers is a tandem type.

- Recreation Pavilion lighting consists of surface mounted fixtures and festoon style string lighting. No automatic lighting controls were observed during the site visit.
- Overall, the electrical distribution system for the Recreation Pavilion appears to be in poor condition. However, the concessionaire did not mention any known electrical issues with regards to the pavilion.



5.8.6.2 Recommendations

The electrical system serving the Recreation Pavilion should be upgraded to improve safety and compliance. The existing pedestal should be replaced with a properly rated unit that includes a main circuit breaker and clearly marked voltage and ampacity ratings. Branch circuit breakers should be replaced with code-compliant breakers, and tandem breakers should be eliminated by providing a panel with adequate circuit capacity.

Lighting should be modernized with energy-efficient fixtures and automatic lighting controls to meet current code requirements. A full evaluation of the electrical system is recommended to confirm proper grounding, circuit protection, and capacity to serve the pavilion's receptacles and RV connection.

5.8.7 Low Voltage/Security

5.8.7.1 Existing Conditions

- No low voltage systems were observed associated with the Recreation Pavilion.

5.8.7.2 Recommendations

None

5.9 Fish Cleaning Station

5.9.1 Overview

5.9.1.1 Year Built

1998

5.9.1.2 Building Area

106 SF

5.9.1.3 Staff/Personnel Capacity Current and Needs

Current Staff: NA

Needs: NA



Fish Cleaning Station



Fish Cleaning Station



Fish Cleaning Station

5.9.2 Architectural

5.9.2.1 Existing Conditions

- Concrete slab on grade.
- Structure is steel column and beams
- Roof is tongue and groove with metal panel
- Equipment at the time was inoperative and required maintenance

5.9.2.2 Recommendations

It was noted that the Fish Station is provided and maintained by Fish, Wildlife & Parks in partnership with Walleyes Unlimited. The Bureau of Reclamation is not responsible for maintaining and operating the station. It is recommended that the controlling entities consider upgrading the current system to operate as intended.

5.9.3 Structural

5.9.3.1 Existing Conditions

- Fish cleaning station is similar to the pavilion structure with (2) steel frame consisting 5x5 HSS columns with 5x7 HSS beams spaced at 8 ft. on center, supported on a concrete slab. The roof is framed with 5/4 Tongue and Groove boards spanning between the frames. All structural elements are in good condition.
- Cast-in-place slab on grade
- 6x6 HSS Steel Column
- 6x10 HSS Steel Beams
- 5/4 T&G Deck Board Roof

5.9.3.2 Recommendations

Structure appears to be in good condition and performing as intended. Continue regular maintenance.

5.9.4 Mechanical

5.9.4.1 Existing Conditions

- The Fish Cleaning Station mechanical systems consist of a fish grinder and disposal system. The fish grinder and disposal system is operated by a push-button control panel. The control enclosure, manufactured by Fabwright Inc., includes forward/reverse motor controls. The grinder and associated pumping equipment are currently inoperative, leaving the system unable to process and discharge fish waste as intended. The control components also show wear and require evaluation for safe operation.
- The Fish Cleaning Station is an open-air pavilion, relying on natural ventilation for odor and humidity control.
- Overall, the Fish Cleaning Station remains functional in form but is in poor condition mechanically. The grinder, pumps, and effluent disposal systems are inoperable, creating a reliance on manual pumping to maintain operation. Control components also appear worn and require further evaluation.

5.9.4.2 Recommendations

The grinder and associated pumping equipment should be repaired or replaced to restore full functionality of the fish waste disposal system. The control panel should be evaluated for safety, and worn components such as push buttons and motor controls should be replaced with code-compliant devices. Consideration should be given to upgrading the grinder system with modern equipment that is easier to maintain and more energy efficient.

5.9.5 Plumbing

5.9.5.1 Existing Conditions

- The Fish Cleaning Station plumbing systems consists of a stainless-steel cleaning table equipped with two flexible, high-spray pre-rinse faucets. Water service appears to be cold water only, with no visible water heating equipment.
- Wastewater from the table drains into a central grinder unit before being conveyed to underground wet wells and dosing tanks. According to Bureau of Reclamation personnel and marina staff, the grinder pumps and secondary dosing tank pumps are currently non-functional. As a result, the wet wells and tanks require frequent manual pumping, and no effluent is being discharged to the absorption fields.

5.9.5.2 Recommendations

The plumbing system should be upgraded to improve reliability and code compliance. The existing fish cleaning table and faucets are functional but should be inspected for leaks, corrosion, and wear. Any damaged fixtures or piping should be replaced with durable, weather-resistant components. The wastewater system requires particular attention. The wet wells, tanks, and absorption field should be evaluated by a qualified contractor to determine whether they can be repaired or if replacement is necessary. Restoring the effluent discharge system is essential to eliminate reliance on manual pumping and to return the station to proper operation.

5.9.6 Electrical

5.9.6.1 Existing Conditions

- The existing electrical service to the Fish Cleaning Station appears to be provided by a dedicated utility transformer with service equipment installed directly adjacent and mounted on a wooden post support. The service equipment, located between the transformer and the Fish Cleaning Station, consists of an exterior-mounted panelboard with the utility meter mounted beside it. The Fish Cleaning Station electrical distribution system appears to be 120/240V single-phase, with the panelboard protected by a 200A main circuit breaker that also serves as the service disconnect.
- The panelboard is in fair condition; however, the existing circuit breakers do not comply with current electrical code requirements, as their AIC ratings are not identified. No visible voltage or ampacity ratings were observed on the panelboard.
- Lighting at the Fish Cleaning Station is minimal and provided by a surface-mounted floodlight. An occupancy sensor appears to control the fixture, though the functionality of this control was not verified during the site visit at night.
- Overall, the electrical distribution system for the Fish Cleaning Station is in fair condition. However, the service panelboard should be replaced, and all circuit breakers should be upgraded to meet current code requirements.

5.9.6.2 Recommendations

The electrical system at the Fish Cleaning Station should be upgraded to ensure safety and compliance with current code requirements. The existing service panelboard should be replaced with a new, properly rated unit that includes clearly identified voltage, ampacity, and AIC ratings. All circuit breakers should be replaced with code-compliant breakers.

The lighting system should be improved by verifying the operation of the occupancy sensor and replacing the existing floodlight with an energy-efficient fixture.

Additional lighting may also be considered to improve visibility and safety at the station during evening hours.

5.9.7 Low Voltage/Security

5.9.7.1 Existing Conditions

- No low voltage systems were observed associated with the Fish Cleaning Station.

5.9.7.2 Recommendations

None

6.0 Facility Requirements

6.1 Purpose and Need

The purpose of the Tiber Marina Master Plan is to evaluate existing deficiencies, address immediate safety concerns, and guide long-term improvements to ensure the continued, safe operation of marina facilities at Tiber Reservoir while meeting the needs of the Bureau of Reclamation, the concessionaire, and the recreating public. A primary and urgent need identified at the site is active bank erosion that is threatening the concessionaire residence, creating unsafe conditions and necessitating immediate vacancy of the structure. This erosion presents both a public safety concern and an operational disruption that must be addressed through relocation, stabilization, and facility planning.

Additional safety needs were identified by users of Tiber Reservoir, including the immediate need for a second lane at the boat ramp to improve launch and retrieval efficiency and to allow for rapid and safe exit from the lake during sudden inclement weather events, which are common at the site. The existing single-lane ramp creates congestion and delays that pose safety risks during high-wind or storm conditions.

To support informed planning decisions, the project team surveyed spaces currently used for daily operations, including the concessionaire building, residence, and utility shed, to assess existing functional requirements and future operational needs. This assessment focused on understanding the equipment and activities currently conducted by the Bureau of Reclamation and the concessionaire and evaluating anticipated growth. The equipment required for daily operations was determined to be minimal and primarily consists of landscape maintenance equipment and general maintenance tools. Based on this analysis and discussions during the scoping meeting, it was determined that consolidating concessionaire functions and operational storage into a single facility would improve efficiency and safety, with a minimum of approximately 3,000 square feet of enclosed space required to accommodate administrative functions, customer services, and necessary equipment and storage.

6.2 Amenities & Space Program

6.2.1 Required Amenities

- Two-lane Boat Ramp (add one additional lane to the existing)
- Fuel Tank (replace existing system)
- Water System/Cistern upgrade
- Sanitary Septic System
- Concessionaire Building (retail store, showers, laundry, food prep, storage)
- Residence Building/RV Pad (separate from concessionaire building)
- Boat/Trailer Parking (parking lot organization)
- Way Finding Signage
- Landscaping and Irrigation

6.2.2 Alternative Amenities

- Maintenance Shop and Equipment Storage
- Swim Beach Development
- Independent Shower/Bath House and Laundry facility
- Staff Housing
- Propane Fill Station
- Cabins
- Playground

6.2.3 Utility and Service Requirements

- Upgrade the water supply system to a larger cistern or install a water treatment system to avoid hauling water.
- Consolidate the electrical system.
- Additional permanent campsites with electrical hookups.
- Additional full hookup campsites

6.2.4 ADA Requirements

- ADA Accessibility code to be followed at the time of this report: ICC A117.1-2017
- All new structures and buildings that are constructed on the Tiber Marina property should be ADA Accessible.
- Sidewalks to primary structures should be established to increase accessibility.
- An ADA Accessible route should be established down to the dock.

6.3 SPACE PROGRAM

Tiber Marina Master Plan **Building Program Space Summary**



January 9, 2026

SPACE TYPE	SPACE TITLE	QUANTITY	SQUARE FEET	TOTAL NET SQUARE FEET
Concessionaire Building	Vestibule	1	60	60
	Check-out Counter	1	120	120
	Retail - Fishing	1	50	50
	Retail - Grocery (dry goods)	1	100	100
	Retail - Refrigeration	1	100	100
	Prep Kitchen (No hood)	1	150	150
	Storage - Kitchen	1	80	80
	Walk-in Cooler (kitchen)	1	8	8
	Walk-in Cooler (retail ice)	1	12	12
	Seating - Indoor	1	200	200
	Seating - Outdoor (covered patio)	0	200	0
	Office	1	120	120
	Bathroom	2	76	152
	Mechanical	1	100	100
	Storage - Misc. Supply	1	200	200
	Add 10% for walls			115
	Subtotal			1,567
Laundry Facility	Laundry (washer/dryer)	1	200	200
	Folding	1	80	80
	Waiting	1	100	100
	Mechanical	0	100	0
	Add 10% for walls			38
	Subtotal			418
Bathhouse	Shower rooms	4	60	240
	Restrooms (separate men's and women's)	2	180	360
	Mechanical	0	100	0
	Add 10% for walls			60
	Subtotal			660
TOTAL ASSIGNABLE BUILDING AREA				2,645
TOTAL GROSS BUILDING AREA with 85% EFFICIENCY				3,042

7.0 Environmental Review

7.1 Traffic

7.1.1 Proposed Project Effect:

Temporary, minor increases in traffic would occur during construction; long-term traffic changes would be consistent with existing recreational use and would not substantially alter local traffic patterns.

Construction-related traffic would be short-term and limited in duration, and operational traffic increases would be incremental.

7.1.2 Permit:

No traffic-related permits are anticipated, as the project does not involve new roadway connections or modifications to state or county highways.

7.1.3 Resources:

This determination is based on review of the proposed action, master plan documentation, and publicly available state and county transportation information (online review only).

7.2 Noise

7.2.1 Proposed Project Effect:

Short-term noise increases would occur during construction from typical equipment and vehicle activity and would be localized and temporary.

Long-term operational noise levels are expected to remain similar to existing recreational use and would not introduce new or unusual noise sources.

7.2.2 **Permit:**

No noise permits are anticipated, as construction would comply with applicable local and state noise standards and occur during normal daytime hours.

7.2.3 **Resources:**

This determination is based on review of the project description, applicable noise regulations available online, and existing site conditions documented in planning materials.

7.3 **Weeds**

7.3.1 **Proposed Project Effect:**

Ground-disturbing activities could create conditions for the introduction or spread of noxious weeds; however, impacts are expected to be minimal and manageable through standard best management practices. The project does not include actions that would intentionally introduce invasive species, and disturbed areas would be stabilized or revegetated as part of construction.

7.3.2 **Permit:**

No additional weed-related permits are anticipated beyond compliance with applicable federal and state noxious weed requirements.

7.3.3 **Resources:**

This determination is based on review of the Federal Noxious Weed Control Act, Executive Order 13112, state noxious weed lists, and project information available online.

7.4 **Water Availability**

7.4.1 **Proposed Project Effect:**

The proposed project would replace three (3) smaller cisterns with two (2) larger-capacity cisterns to improve water storage efficiency and reduce delivery frequency.

Potable water would continue to be supplied by truck using transported water sources, consistent with existing operations. The proposed change would not increase water demand, require new water withdrawals, or affect local or regional water availability.

7.4.2 Permit:

No water appropriation or additional water supply permits are anticipated, as the project does not introduce new water sources or increase withdrawal volumes.

7.4.3 Resources:

This determination is based on review of the proposed action, master plan utility recommendations, and publicly available Bureau of Reclamation water management information available online.

7.5 Water Quality

7.5.1 Proposed Project Effect:

Short-term construction activities could result in temporary disturbance of soils with the potential for sediment transport; however, impacts would be minimal and controlled through standard erosion and sediment control measures. Replacement of existing utilities with upgraded water and wastewater infrastructure would improve long-term protection of surface water and groundwater quality. The proposed project would not introduce new sources of contamination and is expected to result in a net improvement to water quality conditions.

7.5.2 Permit:

Construction activities disturbing soil would require coverage under the National Pollutant Discharge Elimination System (NPDES) stormwater program, including preparation and implementation of a Stormwater Pollution Prevention Plan (SWPPP), as applicable. Installation of on-site wastewater treatment systems would be subject to state and local permitting requirements.

7.5.3 Resources:

This determination is based on review of the proposed action, master plan utility improvements, Montana Department of Environmental Quality guidance, and publicly available water quality regulations reviewed online.

7.6 Relocation of Fuel Tank and Pumping Station

7.6.1 Proposed Project Effect:

The proposed project would decommission and remove the existing below-ground fuel tank and relocate the existing fuel pump to a different location within the site. A new 10,000-gallon aboveground steel fuel storage tank would be installed near the relocated pump to improve safety, accessibility, and regulatory compliance. These changes would reduce environmental risk and would not result in new or expanded fueling operations beyond existing use.

7.6.2 Permit:

Fuel tank removal and installation would require compliance with applicable federal, state, and local regulations, including Montana Department of Environmental Quality requirements and federal Spill Prevention, Control, and Countermeasure (SPCC) regulations, as applicable.

7.6.3 Resources:

This determination is based on review of the proposed action, master plan documentation, and publicly available fuel storage regulatory guidance available online.

7.7 Vegetation

7.7.1 Proposed Project Effect:

Limited vegetation clearing would be required to support construction of a new RV dump station, leach field, utilities, and additional campsite development. Existing trees, including the established shelterbelt, would be preserved to the greatest extent practicable, though minor clearing may be necessary for utility installation.

Disturbed native grasses and vegetation would be stabilized or restored following construction.

7.7.2 Permit:

No vegetation-specific permits are anticipated beyond standard construction and land management requirements.

7.7.3 Resources:

This determination is based on review of the proposed action, master plan site layouts, and publicly available vegetation and land management guidance reviewed online.

7.8 Demolition of Structures

7.8.1 Proposed Project Effect:

The proposed project would include demolition and removal of several existing structures that are at or beyond their useful life, including the residence, concession building, utility building, and other minor site features. Demolition activities would be localized and temporary. Due to the age of the structures, there is potential for regulated building materials to be present, which would be managed in accordance with applicable requirements.

7.8.2 Permit:

Demolition activities would require compliance with applicable state and federal regulations governing solid waste disposal and handling of hazardous building materials, if encountered.

7.8.3 Resources:

This determination is based on review of the proposed action, master plan documentation, and publicly available demolition and hazardous material regulatory guidance available online.

7.9 Bank Stabilization

7.9.1 Proposed Project Effect:

Bank stabilization would be required along the shoreline below the existing residence and concession building to address ongoing erosion. Additional disturbance within the lake shoreline and nearshore waters would occur to construct a second boat ramp and associated docks. Construction of boat ramp access improvements and staging areas may require additional localized bank stabilization but would result in long-term shoreline protection and reduced erosion risk.

7.9.2 Permit:

Bank stabilization and in-water work would require applicable federal and state permits, including authorization under Section 404 of the Clean Water Act and associated Montana approvals, such as a 310 Permit, water quality certification, and DNRC authorization if work occurs on navigable waters or state-owned submerged lands, as applicable.

7.9.3 Resources:

This determination is based on review of the proposed action, master plan documentation, and publicly available shoreline stabilization and permitting guidance reviewed online.

7.10 Cultural Resources

7.10.1 Proposed Project Effect:

This determination is based on review of the proposed action, master plan documentation, and publicly available shoreline stabilization and permitting guidance reviewed online.

7.10.2 Permit:

If project activities have the potential to affect cultural resources, coordination and review may be required with applicable agencies, including the Montana State Historic Preservation Office (SHPO), Tribal Historic Preservation Offices (THPOs),

the Montana State Archaeologist, the Montana Office of Indian Affairs, the Bureau of Indian Affairs, and other appropriate federal or tribal entities, as applicable.

7.10.3 Resources:

This determination is based on review of available cultural resource information, master plan documentation, and publicly available cultural resource records maintained by the Montana State Historic Preservation Office and related agencies.

7.11 Fish and Wildlife

7.11.1 Proposed Project Effect:

The project area supports generalist wildlife species and habitats typical of the surrounding landscape. Project activities could temporarily disturb wildlife during construction; however, impacts are expected to be localized and short-term. No long-term adverse effects to regional wildlife populations or habitat connectivity are anticipated.

7.11.2 Permit:

If project activities have the potential to affect fish or wildlife resources, coordination may be required with Montana Fish, Wildlife & Parks, the U.S. Fish and Wildlife Service, and other applicable state or federal resource agencies, as appropriate.

7.11.3 Resources:

This determination is based on review of publicly available wildlife and habitat information, including resources maintained by Montana Fish, Wildlife & Parks and other natural resource agencies.

8.0 Develop Alternatives

The alternatives presented in this section are based on input received during the first public meeting held on July 15th, 2025 at Ru's Marina as well as in conjunction with the Bureau of Reclamation to ensure the master plan stayed within the scope and budget anticipated by the bureau. Stakeholders identified priorities related to infrastructure modernization, accessibility, utility upgrades, and expanded amenities that are outlined in the section below.

8.1 Public Meeting #1 – July 14th/15th, 2025

The following is based on information and images shared during the public presentation. The full presentation can be found in Appendix E.

A public input meeting was held on July 15th at Ru's Marina on Tiber Reservoir as part of the Bureau of Reclamation's effort to develop a comprehensive Tiber Marina Master Plan. The purpose of the meeting was to present preliminary planning concepts, outline required and optional amenities, and solicit feedback from stakeholders including marina users, local residents, recreationists, and concession interests. Attendees were invited to comment on infrastructure needs, service improvements, accessibility, and long-term development priorities.

8.1.1.1 Public Feedback for Required Amenities

- Public input strongly supported the need to modernize and expand core marina infrastructure to improve safety, reliability, and visitor experience.
- Boat Ramp Improvements: Attendees emphasized congestion during peak season and generally supported expanding the existing ramp from one lane to a two-lane configuration to improve launch efficiency.
- Fuel System Replacement: Replacement of the existing fuel tank system was viewed as critical for safety, environmental protection, and continued marina operations.

- **Water System Upgrades:** Participants noted frequent limitations with the current system and supported cistern upgrades or other improvements to ensure consistent potable water availability.
- **Sanitary Septic System:** The need for a modern, compliant septic system was considered essential for expanded use and future development.
- **Concessionaire Building:** There was strong interest in a centralized facility providing retail services, restrooms, showers, laundry, food service, kitchen space, and operational storage.
- **Residence Building:** Public comments supported a separate residential structure for on-site management or concession staff to enhance security and improve responsiveness.
- **Boat and Trailer Parking:** Attendees frequently cited disorganized parking and safety concerns, expressing support for improved parking lot layout and circulation.
- **Wayfinding Signage:** Improved signage was encouraged to enhance navigation, safety, and first-time visitor experience.
- **Landscaping and Irrigation:** Input generally supported tasteful landscaping to improve aesthetics, reduce dust, and enhance visitor comfort while maintaining durability and low maintenance.

8.1.1.2 Public Feedback for Alternative Amenities

Alternative amenities were viewed as desirable enhancements that would increase recreational value and length of stay, subject to funding and environmental considerations.

- **Maintenance Shop and Equipment Storage:** Supported as a practical operational improvement to reduce downtime and improve marina upkeep.
- **Swim Beach Development:** Many attendees expressed interest in a designated swim area to expand non-boating recreation opportunities.
- **Independent Shower/Bath House and Laundry:** Viewed as beneficial, particularly for campers and transient boaters. If possible, many users showed interest in

having this included in the concessionaire building to centralize utilities as well as for security and operations purposes.

- Staff Housing: Supported as a potential benefit for staffing continuity and extended operating seasons.
 - Propane Fill Station: Seen as a convenience amenity for campers and RV users.
 - Cabins: Cited as a popular option to diversify lodging options and attract longer-term visitors, but was not high on the priority list.
 - Playground: Supported by families as a way to improve amenities for children.
 - Frisbee Golf Course: Received interest as a low-impact recreational enhancement that aligns with outdoor recreation trends.
-

8.1.1.3 Public Feedback for Utility and Service Requirements

Utilities and services were identified as a critical foundation for both current operations and future growth.

- Water Supply: Many participants supported upgrading to a larger cistern or installing a water treatment system to eliminate the need for hauled water.
 - Electrical System: Consolidation and modernization of electrical infrastructure was identified as necessary for safety, reliability, and expanded amenities.
 - Campsites with Electrical Hookups: There was strong public interest in increasing the number of electrical hookup campsites to meet demand. Upgrading those campsites to a high electrical supply was also mentioned as modern RVs and campers require more power that is currently unavailable.
 - Full Hookup Campsites: Attendees expressed support for additional full hookup sites as a way to attract longer stays and a broader visitor base.
-

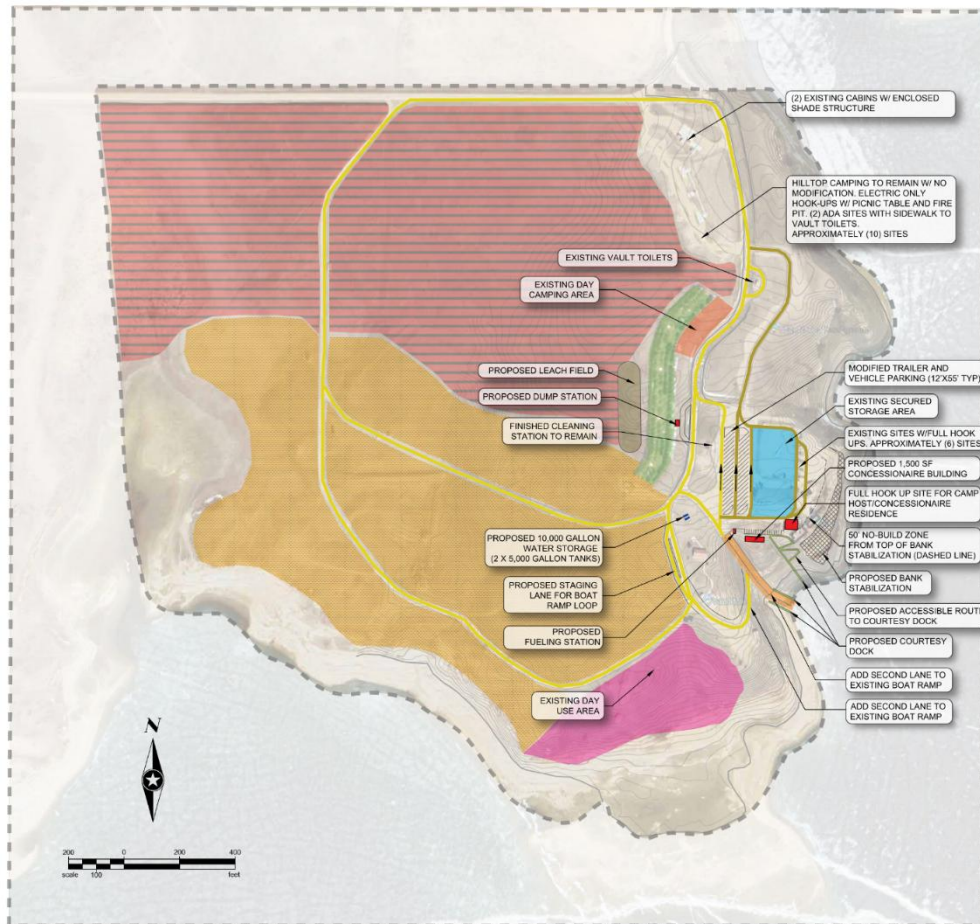
8.1.1.4 Public Feedback for ADA Requirements

Accessibility was consistently raised as an important consideration, with broad support for inclusive design.

- Participants emphasized the importance of sidewalks connecting primary structures to improve accessibility and safety.
- Establishing an ADA-accessible route to the dock was identified as a priority to ensure equitable access to marina facilities.

All four (4) options include primary amenities that were established as high priority during the design team's time on site and were conveyed during the public meeting. Each amenity is proposed in sequential order based on importance to the community and operations of the marina and campground if the master plan were to be completed in a phased approach.

8.2 Option 1 – 1,500 Sq. Ft. Concessionaire Building & Utility Updates



OPTION 1: SEE APPENDIX C

8.2.1 Site Plan Layout (see MARINA SITE PLAN – OPTION 1)

8.2.1.1 Boat Ramp

A high priority item and concern was the limited access to/from the water with only one existing boat ramp lane. An essential first phase of the master plan will be to expand the boat ramp. The existing boat ramp will be widened to accommodate two lanes, allowing simultaneous loading and unloading of boats to reduce congestion.

8.2.1.2 Boat/Trailer Parking

The existing boat/trailer parking system will be developed to designate thirty-five (35) parking stalls. The stalls will be delineated by precast concrete curb stops. for clear organization and include one-way traffic to pull in and out of the lot. This is a high priority item that was expressed by the Bureau of Reclamation, the current concessionaire at the time of this report and the community. Consideration for the new master plan site plan layout should be considered when completing the development of the parking lot.

8.2.1.3 Water & Septic Utility System Upgrade

The water and sewer system upgrades are crucial to the operations of the marina and campground before other building systems and camp site development begins. The water system will need to be upgraded to a larger cistern to accommodate demand. This will still require the concessionaire to haul water to the site and could be problematic during peak season and availability of distributors. An alternative and best solution is to provide a water treatment system on-site pulling water from the lake or well.

The current on-site wastewater system is undersized and should be abandoned. The new septic system will be sized accordingly based on the building program and anticipated usage. A new RV dump station will be placed on the west side of the main road into the marina with a pull-out not to impede traffic. The leach field for the new septic system will be relocated on the west side of the existing shelter belt of trees.

8.2.1.4 Electrical System Consolidation

The current electrical distribution around the campground will be reconfigured and consolidated to one central control point. This will provide clear location for where electrical lines are on site and can be provided as each location of the campground is developed. The size of the electrical service should be sized based on the anticipated load of a fully developed master plan or could be upgraded as the campground is constructed. The latter is less cost-effective.

8.2.1.5 Concessionaire Building

Option 1 proposes a new roughly 1,500 square foot Concessionaire Building located at the point east of the existing location. This site poses multiple benefits to keep the concessionaire centralized in the campground and provides the best visual connection to the boat ramp and campers entering the campground.

- Replaces the existing structure.
- Includes similar operational functions to the current concessionaire building.

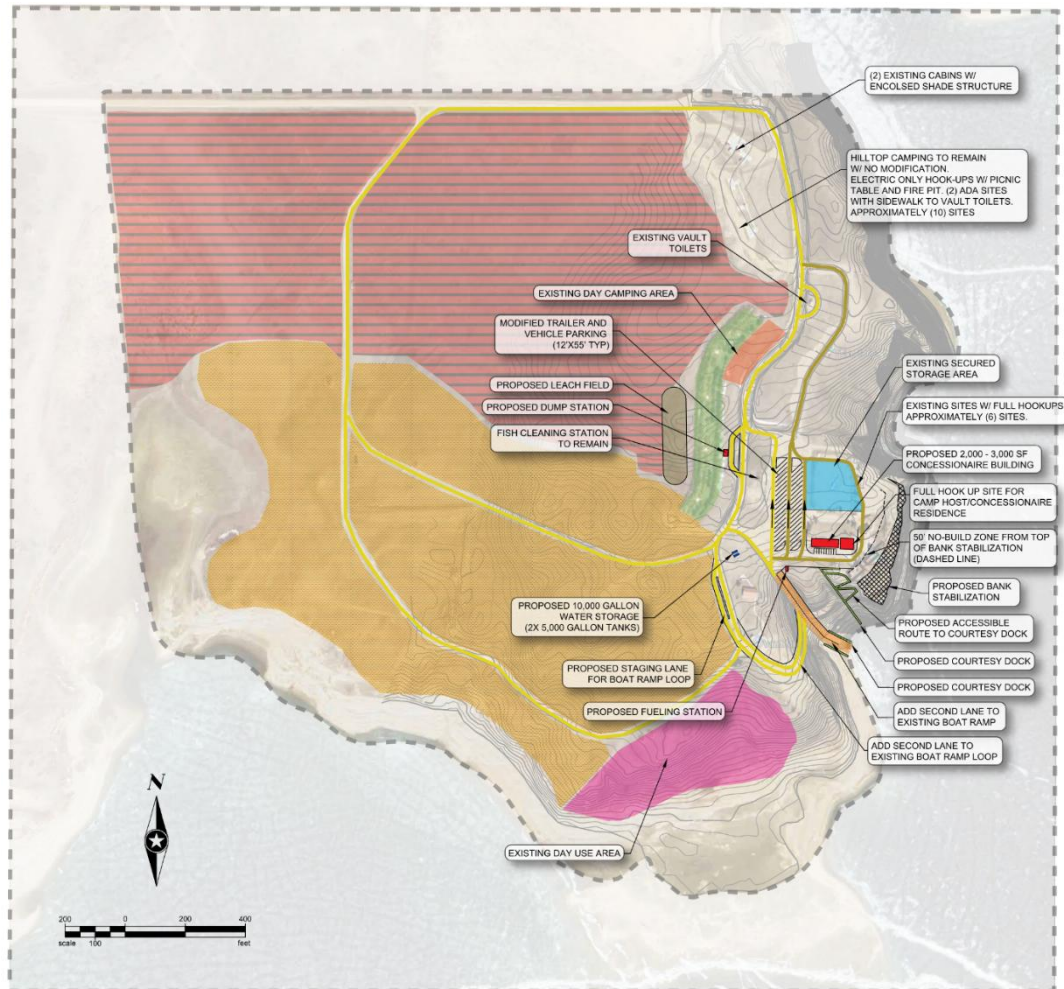
8.2.1.6 Residence Building

Due to the proximity of the current residence to the eroding bank and the potential slope failure, this is a high priority item. A new residence building will not be constructed. A Full Hook Up RV campsite will be developed for the concessionaire near the new concessionaire building but in a safe location outside of the designated fifty-foot no-build zone of the eroding bank.

8.2.1.7 Bank Stabilization

On the east side of the marina property below the current concessionaire and residence building is a bank slope quickly eroding. Bank stabilization will be implemented along the bank as well as designating a 50' No-Build zone. This no-build zone will become green space and ensure that no structures are erected in that area and avoid the risk of failing if the bank were to erode further in the future.

8.3 Option 2 – 3,000 Sq. Ft. Concessionaire Building w/ Bathhouse and Laundry



OPTION 2: SEE APPENDIX C

8.3.1 Site Plan Layout (see MARINA SITE PLAN – OPTION 2)

8.3.1.1 Boat Ramp

A high priority item and concern was the limited access to/from the water with only one existing boat ramp lane. An essential first phase of the master plan will be to expand the boat ramp. The existing boat ramp will be widened to accommodate two lanes, allowing simultaneous loading and unloading of boats to reduce congestion.

8.3.1.2 Boat/Trailer Parking

The existing boat/trailer parking system will be developed to designate thirty-five (35) parking stalls. The stalls will be delineated by precast concrete curb stops. for clear organization and include one-way traffic to pull in and out of the lot. This is a high priority item that was expressed by the Bureau of Reclamation, the current concessionaire at the time of this report and the community. Consideration for the new master plan site plan layout should be considered when completing the development of the parking lot.

8.3.1.3 Water & Septic Utility System Upgrade

The water and sewer system upgrades are crucial to the operations of the marina and campground before other building systems and camp site development begins. The water system will need to be upgraded to a larger cistern to accommodate demand. This will still require the concessionaire to haul water to the site and could be problematic during peak season and availability of distributors. An alternative and best solution is to provide a water treatment system on-site pulling water from the lake or well.

The current on-site wastewater system is undersized and should be abandoned. The new septic system will be sized accordingly based on the building program and anticipated usage. A new RV dump station will be placed on the west side of the main road into the marina with a pull-out not to impede traffic. The leach field for the new septic system will be relocated on the west side of the existing shelter belt of trees.

8.3.1.4 Electrical System Consolidation

The current electrical distribution around the campground will be reconfigured and consolidated to one central control point. This will provide clear location for where electrical lines are on site and can be provided as each location of the campground is developed. The size of the electrical service should be sized based on the anticipated load of a fully developed master plan or could be upgraded as the campground is constructed. The latter is less cost-effective.

8.3.1.5 Concessionaire Building

Option 3 proposes a new roughly 3,000 square foot Concessionaire Building located across the road from the existing location just south of the secure boat/trailer storage and full hook-up camping sites. This site poses multiple benefits to keep the concessionaire centralized in the campground and provides a good visual connection to the lake and visitors entering the Marina boat ramp.

- Replaces the existing structure.
- Includes similar operational functions to the current concessionaire building.
- Includes a bathhouse and laundry facility to centralize water and sewer utilities.

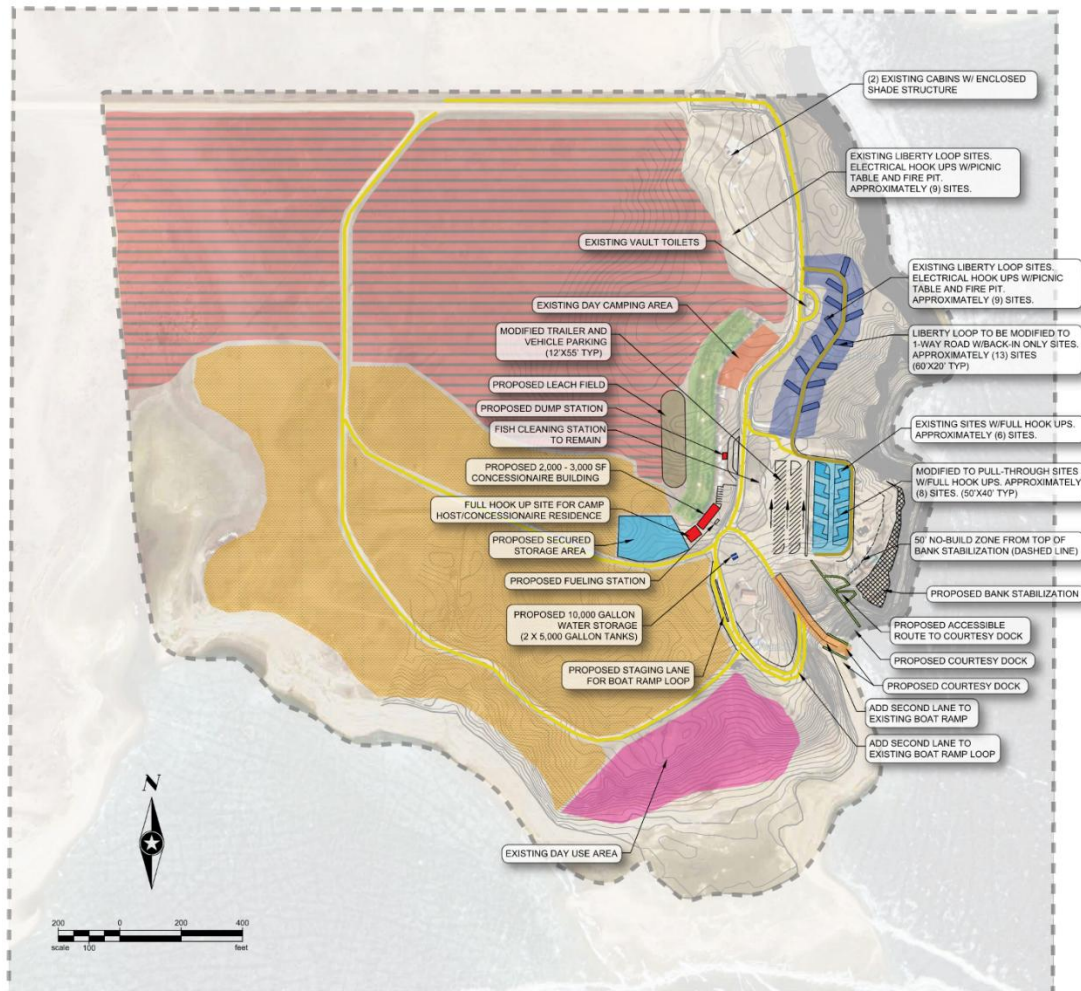
8.3.1.6 Residence Building

Due to the proximity of the current residence to the eroding bank and the potential slope failure, this is a high priority item. A new residence building will not be constructed. A new residence building will not be constructed. A Full Hook Up RV campsite will be developed immediately to the east of the new concessionaire building but in a safe location outside of the designated fifty-foot no-build zone of the eroding bank.

8.3.1.7 Bank Stabilization

On the east side of the marina property below the current concessionaire and residence building is a bank slope quickly eroding. Bank stabilization will be implemented along the bank as well as designating a 50' No-Build zone. This no-build zone will become green space and ensure that no structures are erected in that area and avoid the risk of failing if the bank were to erode further in the future.

8.4 Option 3 – 3,000 Sq. Ft. Concessionaire Building w/ Bathhouse and Laundry & 20% Campsite Increase



OPTION 3: SEE APPENDIX C

8.4.1 Site Plan Layout

8.4.1.1 Boat Ramp

A high priority item and concern was the limited access to/from the water with only one existing boat ramp lane. An essential first phase of the master plan will be to expand the boat ramp. The existing boat ramp will be widened to accommodate two lanes, allowing simultaneous loading and unloading of boats to reduce congestion.

8.4.1.2 Boat/Trailer Parking

The existing boat/trailer parking system will be developed to designate thirty-five (35) parking stalls. The stalls will be delineated by precast concrete curb stops. for clear organization and include one-way traffic to pull in and out of the lot. This is a high priority item that was expressed by the Bureau of Reclamation, the current concessionaire at the time of this report and the community. Consideration for the new master plan site plan layout should be considered when completing the development of the parking lot.

8.4.1.3 Water & Septic Utility System Upgrade

The water and sewer system upgrades are crucial to the operations of the marina and campground before other building systems and camp site development begins. The water system will need to be upgraded to a larger cistern to accommodate demand. This will still require the concessionaire to haul water to the site and could be problematic during peak season and availability of distributors. An alternative and best solution is to provide a water treatment system on-site pulling water from the lake or well.

The current on-site wastewater system is undersized and should be abandoned. The new septic system will be sized accordingly based on the building program and anticipated usage. A new RV dump station will be placed on the west side of the main road into the marina with a pull-out not to impede traffic. The leach field for the new septic system will be relocated on the west side of the existing shelter belt of trees.

8.4.1.4 Electrical System Consolidation

The current electrical distribution around the campground will be reconfigured and consolidated to one central control point. This will provide clear location for where electrical lines are on site and can be provided as each location of the campground is developed. The size of the electrical service should be sized based on the anticipated load of a fully developed master plan or could be upgraded as the campground is constructed. The latter is less cost-effective.

8.4.1.5 Concessionaire Building

Option 3 proposes a new roughly 3,000 square foot Concessionaire Building located at the south end of the shelter belt on the west side of the main road entering the marina. This site poses multiple benefits to keep the concessionaire centralized and provides a good visual connection to the entire campground as well as ease of circulation for those entering into the Marina to camp or launch a boat.

- Replaces the existing structure.
- Concessionaire portion includes retail space, a small prep kitchen, and storage.
- Includes a bathhouse and laundry facility to centralize water and sewer utilities.

8.4.1.6 Residence Building

Due to the proximity of the current residence to the eroding bank and the potential slope failure, this is a high priority item. A new residence building will not be constructed. A new residence building will not be constructed. A Full Hook Up RV campsite will be developed immediately adjacent to the new concessionaire building.

8.4.1.7 Camp Sites

An approximate increase of 20% of campsites will be added to the existing electrical hookup sites in the Liberty Loop and Full Hook-up campsite locations. This will increase Liberty Loop's existing nine (9) campsites to thirteen (13) with a new configuration while keeping the campsites separated for privacy.

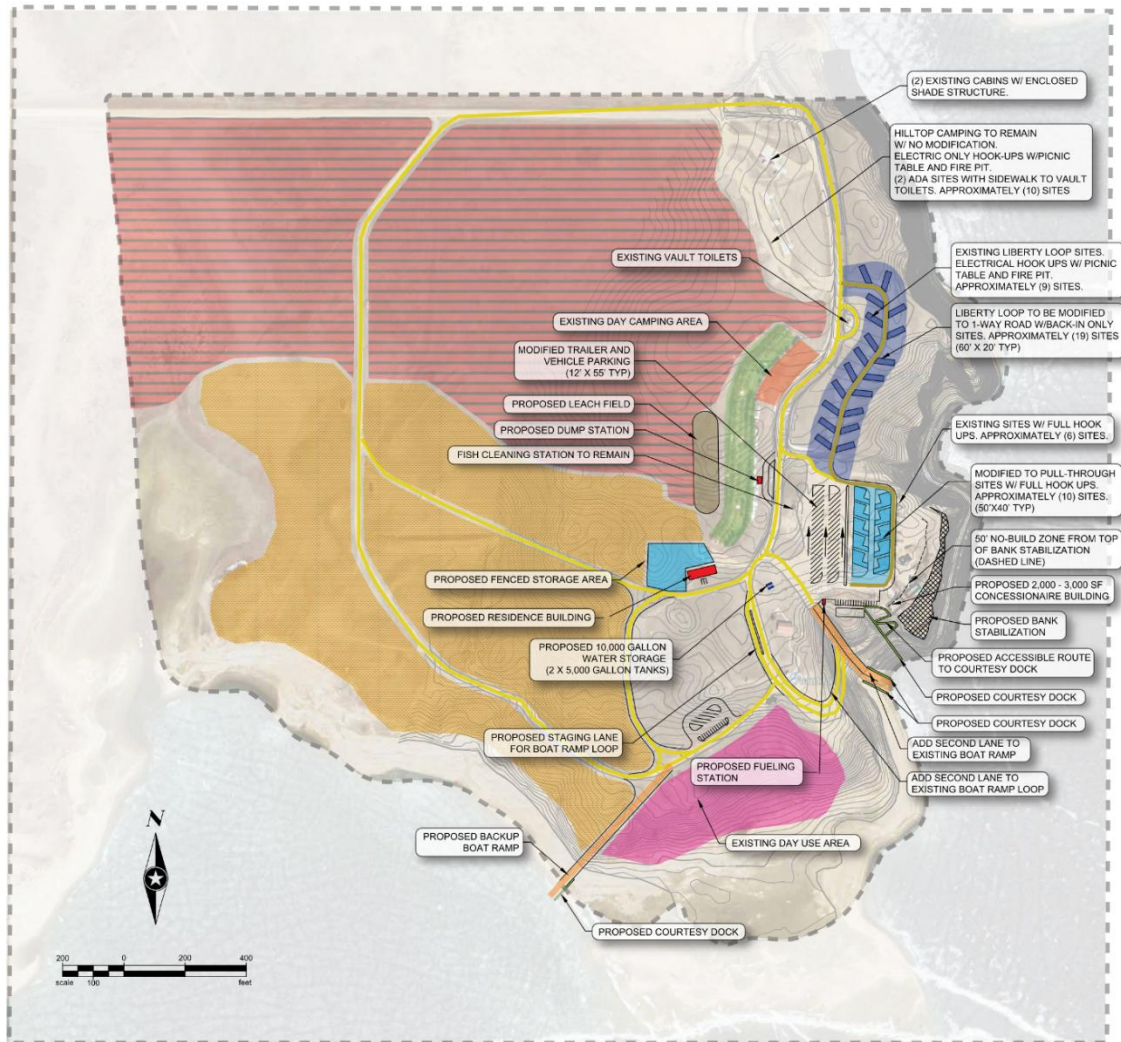
The Full Hook-up sites will increase from six (6) existing sites all facing the east to an eight (8) campsite configuration with four facing east and four facing west. Due to the reconfiguration, the secure boats/trailer storage will be relocated up the hill next to the new concessionaire building.

8.4.1.8 Bank Stabilization

On the east side of the marina property below the current concessionaire and residence building a bank slope is quickly eroding. Bank stabilization will be

implemented along the bank as well as designating a 50' No-Build zone. This no-build zone will become green space and ensure that no structures are erected in that area and avoid the risk of failing if the bank were to erode further in the future.

8.5 Option 4 – Concessionaire & Residence Buildings w/ Bathhouse and Laundry & 50% Campsite Increase



OPTION 4: SEE APPENDIX C

8.5.1 Site Plan Layout

8.5.1.1 Boat Ramp

A high priority item and concern was the limited access to/from the water with only one existing boat ramp lane. An essential first phase of the master plan will be to expand the boat ramp. The existing boat ramp will be widened to accommodate two lanes, allowing simultaneous loading and unloading of boats to reduce congestion.

An option to add a second boat ramp location is shown west of the Day-Use Beach area for increase access to/from the lake. This is not a high priority and can be in a future phase of the marina campground development.

- A second boat ramp will be added to support increased day-use activity.
- A small trailer parking lot will be constructed adjacent to the new ramp.
- A playground will be installed to enhance family-friendly recreation.

8.5.1.2 Boat/Trailer Parking

The existing boat/trailer parking system will be developed to designate thirty-five (35) parking stalls. The stalls will be delineated by precast concrete curb stops. for clear organization and include one-way traffic to pull in and out of the lot. This is a high priority item that was expressed by the Bureau of Reclamation, the current concessionaire at the time of this report and the community. Consideration for the new master plan site plan layout should be considered when completing the development of the parking lot.

8.5.1.3 Water & Septic Utility System Upgrade

The water and sewer system upgrades are crucial to the operations of the marina and campground before other building systems and camp site development begins. The water system will need to be upgraded to a larger cistern to accommodate demand. This will still require the concessionaire to haul water to the site and could be problematic during peak season and availability of distributors. An alternative and best solution is to provide a water treatment system on-site pulling water from the lake or well.

The current on-site wastewater system is undersized and should be abandoned. The new septic system will be sized accordingly based on the building program and anticipated usage. A new RV dump station will be placed on the west side of the main road into the marina with a pull-out not to impede traffic. The leach field for the new septic system will be relocated on the west side of the existing shelter belt of trees.

8.5.1.4 Electrical System Consolidation

The current electrical distribution around the campground will be reconfigured and consolidated to one central control point. This will provide clear location for where electrical lines are on site and can be provided as each location of the campground is developed. The size of the electrical service should be sized based on the anticipated load of a fully developed master plan or could be upgraded as the campground is constructed. The latter is less cost-effective.

8.5.1.5 Concessionaire Building

Option 4 proposes a new roughly 3,000 square-foot Concessionaire Building located at the point east of the existing location. This site poses multiple benefits to keep the concessionaire centralized in the campground and provides the best visual connection to the boat ramp and campers entering the campground.

Replaces the existing structure.

- Concessionaire portion includes retail space, a small prep kitchen, and storage.
- Includes a bathhouse and laundry facility to centralize water and sewer utilities.

8.5.1.6 Residence Building

A separate residence will be constructed at the top of the hill overlooking the marina and concessionaire building. The location is on the south end of the shelter belt on the north side of the main road coming into the marina. The secure boat and trailer storage will be adjacent to the residence for added security and oversight. The location of the residence adds privacy for the concessionaire while still being central within the campground and easily accessible to assist campers after hours if needed. It also provides optimal visual connection to Liberty Loop and to the south open camping area. The residence is anticipated to be a 1,500 square foot 3-bedroom 2-bathroom house.

8.5.1.7 Camp Sites

An approximate increase of 50% of campsites will be added to the existing electrical hookup sites in the Liberty Loop and Full Hook-up campsite locations. This will increase Liberty Loop's existing nine (9) campsites to nineteen (19) with a new configuration with increased density allowing for more campers.

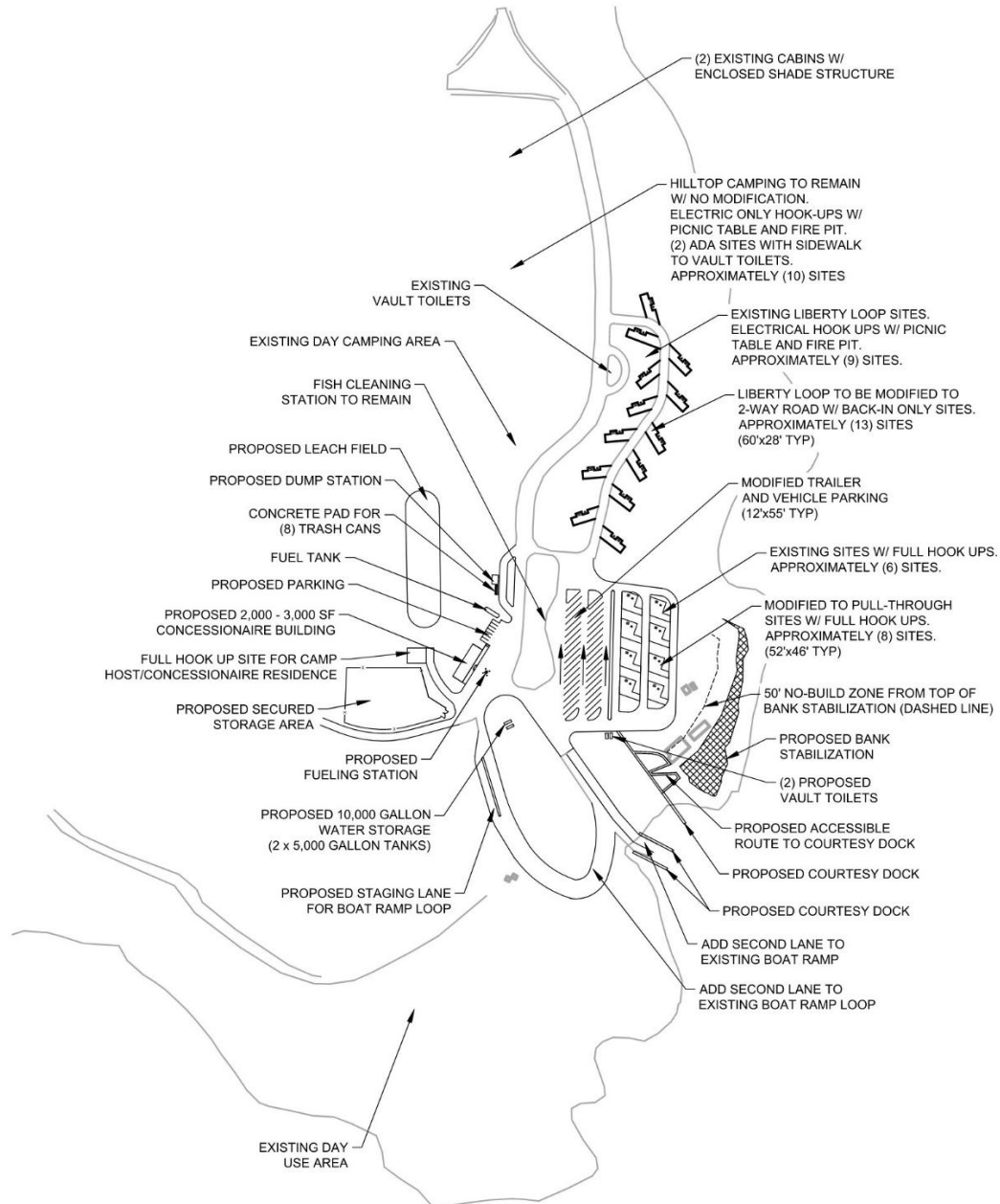
The Full Hook-up sites will increase from six (6) existing sites all facing the east to a ten (10) campsite configuration with five facing east and five facing west. Due to the reconfiguration, the secure boats/trailer storage will be relocated up the hill next to the new concessionaire/residence building.

8.5.1.8 Bank Stabilization

On the east side of the marina property below the current concessionaire and residence building a bank slope is quickly eroding. Bank stabilization will be implemented along the bank as well as designating a 50' No-Build zone. This no-build zone will become green space and ensure that no structures are erected in that area and avoid the risk of failing if the bank were to erode further in the future.

9.0 Preferred Alternative

The following is the Preferred Alternative Planning Option that was reviewed and chosen by the Bureau of Reclamation based on the four alternatives that were presented. The Preferred Alternative was then refined based on Bureau of Reclamation comments as well as feedback received from the public. An Opinion of Probable Cost has been developed and can be found in section 10.0 Cost Estimates.



9.1 Overview of the Preferred Alternative

The Preferred Alternative focuses on addressing critical access, utility, safety, and operational constraints while positioning the marina and campground for sustainable long-term use and phased expansion. The proposed civil and site improvements prioritize high-demand infrastructure upgrades identified by the Bureau of Reclamation, the concessionaire, and community stakeholders, while maintaining flexibility to accommodate future buildout envisioned in the Master Plan.

From an outcomes perspective, the Preferred Alternative reduces operational and safety risks by correcting infrastructure deficiencies, improving site access, and strengthening the reliability of core utilities. By prioritizing durable, right-sized investments, the alternative minimizes long-term maintenance demands, reduces lifecycle costs, and protects existing federal assets. These improvements enhance operational efficiency and visitor safety while advancing the Bureau of Reclamation's mission to manage infrastructure responsibly, support public recreation, and ensure sustainable use of facilities over the long term.

9.2 Master Plan Basis of Design

The amenities and upgrades summarized below are drawn from the Master Plan and are intended to inform and support development of the Preferred Option.

9.2.1 Boat Ramp, Staging Lane, and Boat Ramp Loop

A key first-phase improvement is the expansion of the existing boat ramp, which is currently limited to a single lane and contributes to congestion during peak use periods. The ramp will be widened to provide two operational lanes, allowing simultaneous launching and retrieval of boats and improving overall throughput. To further reduce congestion and improve operational efficiency, a dedicated staging lane will be provided upstream of the ramp to allow boaters to prepare and queue vessels prior to launching, minimizing delays at the ramp apron. Supporting these improvements, two boat docks and one ADA-accessible courtesy dock will be

constructed to facilitate safe loading and unloading, enhance accessibility, and improve circulation between the water and the main parking area.

9.2.2 Boat/Trailer Parking

The boat and trailer parking area will be redeveloped as a high-priority site improvement to formalize parking operations and reduce user conflicts. The preferred layout establishes thirty-five (35) designated boat/trailer parking stalls, delineated with precast concrete curb stops for clarity and durability. The parking circulation will be converted to one-way ingress and egress, improving maneuverability and safety. The parking configuration will be coordinated with the broader master plan site layout to ensure compatibility with future development and circulation patterns.

9.2.3 Water & Septic Utility System Upgrade

Critical water and wastewater utility upgrades are proposed as foundational improvements required prior to additional building or campsite development. The existing water storage capacity will be increased through replacement or augmentation of cisterns to achieve a targeted storage volume of 8,000 to 10,000 gallons, significantly reducing water delivery frequency. Modular tank systems will be evaluated to improve scalability and mitigate water-age concerns. The existing on-site wastewater system, which is undersized, will be abandoned and replaced with a new septic system sized for the full building program and anticipated demand. A new RV dump station will be constructed on the west side of the main marina access road, including a pull-out lane to prevent traffic obstruction. The associated leach field will be relocated west of the existing shelterbelt, and because the new full hook-up campsites are located downgradient, an intermediate pump system will be installed to convey wastewater flows uphill to the treatment area.

9.2.4 Electrical System Consolidation

The Preferred Alternative consolidates the electrical distribution system into a centralized control location. This approach provides improved system clarity, simplifies future phasing, and reduces long-term operational complexity. Electrical

service will be sized to meet the anticipated demands of the fully developed master plan; while incremental upgrades could be implemented over time, upfront sizing is identified as the more cost-effective and operationally sound strategy.

9.2.5 Concessionaire Building

9.2.5.1 Overview

Option 3 proposes construction of a new approximately 3,000 square foot Concessionaire Building located at the south end of the shelter belt on the west side of the primary access road entering the marina. The building is intended to replace the existing concessionaire structure and consolidate visitor services in a highly visible, centrally located facility. The site provides clear visual connection to the campground and marina, efficient pedestrian and vehicular circulation, and convenient access for campers, day-users, and boaters entering the site.

The proposed building will house a retail concessionaire space, small prep kitchen, associated storage areas, and a public bathhouse and laundry facility. Co-locating these uses enables efficient sharing of water, sewer, and utility infrastructure while improving user convenience and operational oversight.

9.2.5.2 Structural Systems

The building is anticipated to be of conventional light wood-frame construction, selected for constructability, cost effectiveness, and compatibility with the surrounding natural context. The structure will be designed in accordance with applicable building codes and local environmental conditions, including snow and wind loads typical of the region. Foundations are expected to consist of concrete footings and slabs or crawlspace construction, depending on site conditions.

9.2.5.3 Architectural Systems

The building will be designed to comply with ADA accessibility requirements, including accessible routes, entrances, restrooms, and service areas. Life-safety systems will include code-compliant fire-rated assemblies, emergency lighting, exit signage, and fire alarm systems appropriate for the building's size and occupancy classification.

While not targeting a specific certification, Sustainability and long-term performance of the building will be essential and will use resource-conscious strategies where feasible, including durable materials, efficient building systems, and reduced maintenance needs. The consolidated program supports operational efficiency while minimizing the overall infrastructure footprint within the marina and campground.

Exterior materials will prioritize durability, low maintenance, and resistance to weathering associated with seasonal use and high public traffic. Anticipated exterior systems may include fiber-cement, engineered wood, or metal siding, standing-seam metal or high-performance composite roofing, aluminum or fiberglass windows and exterior doors.

The architectural expression will be functional and understated, with forms, colors, and materials selected to complement the marina and campground setting while minimizing long-term maintenance requirements.

Interior construction will utilize robust, easy-to-clean finishes suitable for public use. Retail and concession areas will be designed for flexible merchandising and service operations, while the prep kitchen will accommodate light food preparation with appropriate finishes, clearances, and washable surfaces. Storage areas will support seasonal inventory and operational needs.

Bathhouse and laundry spaces will include moisture-resistant finishes, non-slip flooring, durable partitions, and fixtures selected for heavy use. Interior layouts will provide intuitive circulation and clear separation between public and staff/service areas.

9.2.5.4 Mechanical, Electrical, and Plumbing (MEP) Systems

Mechanical systems will be designed for seasonal occupancy and energy efficiency. Heating and ventilation systems will provide comfort for staff and users while accommodating high humidity conditions in bathhouse and laundry areas. Electrical systems will support retail operations, kitchen equipment, laundry machines, interior and exterior lighting, and life-safety systems.

Lighting will emphasize energy-efficient fixtures with durable housings suitable for extended operation. Exterior lighting will support safe nighttime circulation while minimizing light spill into adjacent campground and natural areas.

Plumbing systems will be designed to serve the concessionaire, kitchen, bathhouse, and laundry functions within a centralized building footprint. The bathhouse and laundry components are intended to centralize water and sewer connections, improving efficiency and reducing redundant infrastructure elsewhere in the campground. Low-flow fixtures may be incorporated to reduce potable water use, subject to operational requirements.

9.2.5.5 Operations Support

To support marina operations, the Preferred Alternative includes installation of a new 10,000-gallon aboveground fuel storage tank located near a new fuel pumping station adjacent to the concessions building. This configuration improves operational efficiency while consolidating fueling infrastructure within a controlled service area.

9.2.6 Concessionaire Residence Site

The proposed full hookup RV concessionaire campsite will be located adjacent to the new concessionaire building, providing convenient access to retail services, bathhouse, laundry, and secure storage. The site is planned to offer full water, sewer, and electrical connections while maintaining privacy from marina traffic through buffering and site orientation. Its proximity to the concessionaire building supports efficient operations, passive oversight of the campground, and enhanced security. The campsite is designed to integrate seamlessly with the marina and campground while prioritizing concessionaire comfort and operational functionality. It was determined through the master planning process that a permanent concessionaire residence would not be included in this plan.

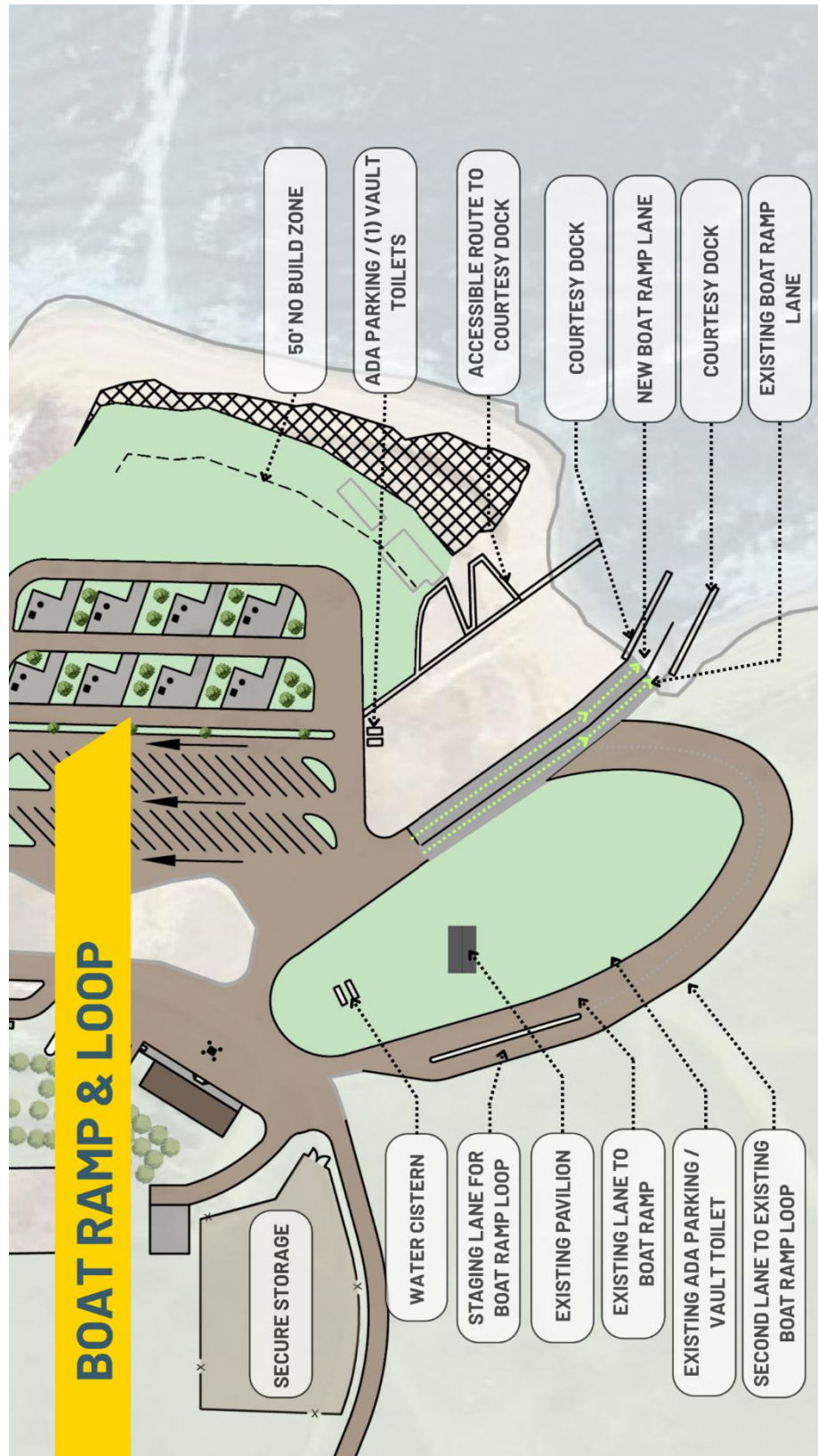
9.2.7 Campsites

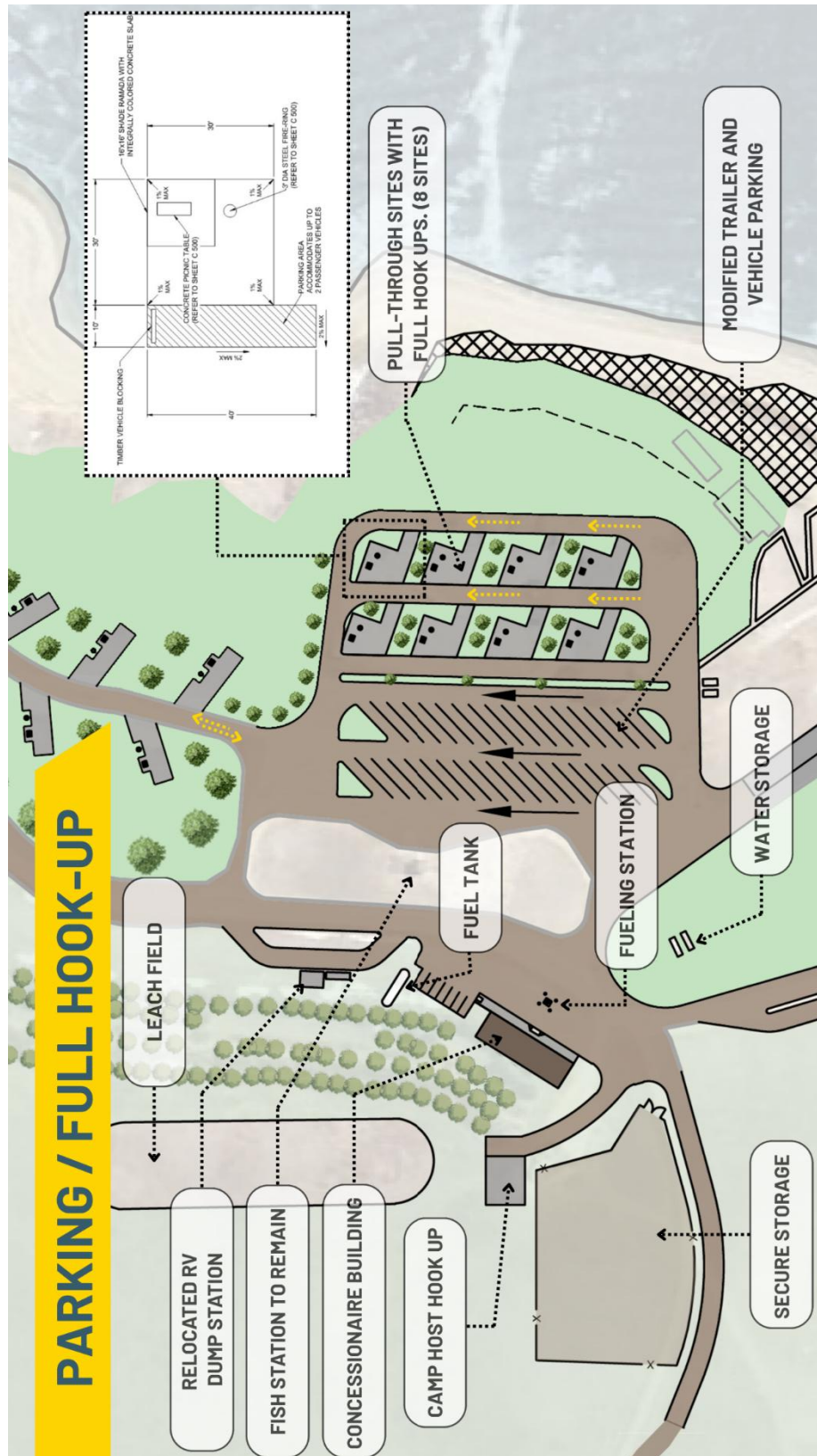
Campground improvements include a strategic increase in capacity while maintaining site separation and user experience. The Liberty Loop will increase from nine (9) to thirteen (13) electrical hookup sites through reconfiguration that

preserves privacy and circulation. Full hook-up sites will expand from six (6) to eight (8), with a revised configuration providing four east-facing and four west-facing sites. As part of this realignment, the secure boat and trailer storage area will be relocated uphill near the proposed concessionaire building to improve site efficiency and access.

9.2.8 Bank Stabilization

Bank stabilization is proposed along the eroding eastern shoreline below the existing concessionaire and residence building. Stabilization measures will protect the shoreline while a 50-foot No-Build Zone is designated to preserve long-term slope stability. This zone will be developed as landscaped open space, ensuring that future structures are not placed within areas susceptible to erosion or potential failure.







10.0 Preferred Option Cost Estimate

The Opinion of Probable Cost is a high-level square foot estimation of probable costs of construction. This includes a low and a high threshold. It should be noted that these costs in line with the currently conditions, but with the in the market these may vary widely. See Appendix F for full cost breakdown.

(Note: This estimate is schematic in nature and is not intended to be a contractual budget amount. Line item costs provided are estimate is based on preliminary design. The information contained herein is only for use by the project owner. Actual cost may range between 10%-15% - plus or minus.)

The cost estimate does not account for inflation and reflects current costs at the time this estimate was completed.

TIBER MARINA MASTER PLAN - PREFERRED OPTION

Overview	Low Total	High Total
Line Item Subtotal	\$ 5,957,856	\$ 9,189,940
Indirect Costs (GC O&P, General Conditions, Contingency) (22.5-28%)	\$ 1,340,517	\$ 2,573,183
Construction Total	\$ 7,298,373	\$ 11,763,124
Permitting and Other Fees	\$ -	\$ -
Professional Design Services (8% Estimated)	\$ 583,870	\$ 941,050
Total Project Cost	\$ 7,882,243	\$ 12,704,174

Option 3 - Phases Totals				
Phase	Construction Cost (Low)	Project Cost (Low)	Construction Cost (High)	Project Cost (High)
1	\$ 998,347	\$ 1,320,813	\$ 1,553,482	\$ 2,147,533
2	\$ 3,953,980	\$ 5,231,116	\$ 6,104,235	\$ 8,438,494
3	\$ 677,950	\$ 896,927	\$ 1,037,413	\$ 1,434,120
4	\$ 327,579	\$ 433,387	\$ 494,811	\$ 684,026
5	\$ -	\$ -	\$ -	\$ -
Totals	\$ 5,957,856	\$ 7,882,243	\$ 9,189,940	\$ 12,704,174

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Total Project Cost	\$ 7,882,243	\$ 12,704,174

Line Item Information				Low Estimate		High Estimate		Phases
Name	Description of Scope of Work	Unit	Amount	Low Cost per Unit	Low Sub-Total	High Cost per Unit	High Sub-Total	
Trailer Parking	Precase concrete parking stops 12'x55'	Unit	35	\$ 1,816.11	\$ 63,564	\$ 2,970.05	\$ 103,952	1
Boat Ramp	Addition of 2nd lane, earthwork, 12" concrete, dock	LF	770	\$ 678.30	\$ 522,291	\$ 1,109.29	\$ 854,153	1
Vault Toilet	Precast concrete	Unit	2	\$ 28,776.72	\$ 57,553	\$ 47,061.27	\$ 94,123	1
Secure boat/trailer storage	Chain link fence	LF	675	\$ 99.92	\$ 67,446	\$ 163.41	\$ 110,302	1
Fuel Station	New P.O.S., fuel line and buried tank	Unit	1	\$ 35,000	\$ 35,000	\$ 40,250.00	\$ 40,250	2
Concessionaire Full	Full Hook-up RV Site	Unit	1	\$ 9,832.31	\$ 9,832	\$ 16,079.69	\$ 16,080	2
Concessionaire Building	Concessions, Laundry & Bathhouse	SF Cost	2,645	\$ 523.64	\$ 1,385,028	\$ 856.36	\$ 2,265,072	2
RV Dumpstation	Dumpstation & septic system	Unit	1	\$ 68,000.00	\$ 68,000	\$ 92,000.00	\$ 92,000	2
Site Electrical	Update electrical and consolidate	Allowance	1	\$ 533,272.95	\$ 533,273	\$ 872,111.04	\$ 872,111.04	2
Site Utilities	New septic & water system, New leach field.	Allowance	1	\$ 784,225.25	\$ 784,225	\$ 1,282,516.75	\$ 1,282,517	2
Singage	Misc. site signage and way-finding	Allowance	1	\$ 33,833.76	\$ 33,834	\$ 45,775.08	\$ 45,775	3
Sidewalk to courtesy dock	5' wide concrete	SF Cost	3,292	\$ 7.59	\$ 24,986	\$ 12.41	\$ 40,854	3
Guardrail	Steel pipe guardrail to courtesy dock	LF Cost	1,032	\$ 79.68	\$ 82,230	\$ 130.32	\$ 134,490	3
General Road Improvements	Crushed Road Mix	SF Cost	355,908	\$ 0.96	\$ 341,672	\$ 1.56	\$ 555,216	3
Full Hookup RV Camp Site	Gravel paving, electrical hook up, water & sewer hookup	Unit	8	\$ 9,832.02	\$ 78,656	\$ 16,079.22	\$ 128,634	4
Liberty Loop: Electrical Hookup RV Camp Site	60x20 Gravel paving, picnic table, fire ring, electrical hook up	Unit	13	\$ 8,851.17	\$ 115,065	\$ 14,475.14	\$ 188,177	4
Storage Shed	Wood frame	SF Cost	620	\$ 63.75	\$ 39,525	\$ 86.25	\$ 53,475	4
Earthwork	Staking/layout, clear & grub, rough grading, fine grading, erosion control	GSF Cost	755,804	\$ 2.27	\$ 1,715,675	\$ 3.06	\$ 2,312,760	ALL
Line Item Subtotal				\$ 5,957,856		\$ 9,189,940		

Option 3 - Phases Totals				
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1	\$ 998,347	\$ 1,320,813	\$ 1,553,482	\$ 2,147,533
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Totals	\$ 5,957,856	\$ 7,882,243	\$ 9,189,940	\$ 12,704,174