

2.0 DESCRIPTION OF ALTERNATIVES

2.1 MARINE RESEARCH AND EDUCATION CENTER

After reviewing the proposed building, research and educational programs and evaluating four potential locations for the MREC at SARI, conceptual site plans for three alternatives were developed. The potential locations included two on the western side of the Salt River Bay: the NPS Visitor Contact Station and the Salt River Marina; one at the southern edge of the Bay: the former NOAA Undersea Research Center; and one on the eastern side, west of Estate Judith's Fancy (Figure 2-1).

These sites were examined in detail, given the information available on existing conditions, and preliminary site plans were developed for each alternative. Among the elements evaluated were floodplains, topography, susceptibility to hurricanes and earthquakes, cultural and historic resources, and environmental impacts. The individual site plans attempted to mitigate impacts to these elements and accommodate the building program in an environmentally responsible manner while providing the means to compare the advantages of each alternative.

The alternatives were designed to keep the MREC buildings in close proximity to one another and thus allow for the efficient use of each site. The MREC was developed in a campus-like pattern to reinforce the center's role as a research facility and to take advantage of site amenities and the proximity of the center to the Bay.

After examining the Visitor Contact Station site, it was determined that the site did not have sufficient water access for a docking facility to accommodate the complete program. Additionally, the land area at the marina is insufficient to support the MREC program without eliminating some, if not all, of the existing marina uses. Given these constraints, the Salt River Marina and the Visitor Contact Station were combined into one alternative. Therefore, three alternatives were developed for the MREC: East Site Alternative located west of Estate Judith's Fancy; South Site Alternative the former NOAA Undersea Research Center; and West Site Alternative the Visitor Contact Station and Salt River Marina.

The site plans developed for this assessment are conceptual in nature and more study, including engineering and geotechnical review, would be done to determine an optimal design for the Preferred Alternative. This would be accomplished during future design phases of the project.

2.1.1 Guidelines for the Physical Plant

The conceptual alternatives were developed from the JICMS guidelines found in *Guidelines from the Joint Institute for Caribbean Marine Studies to the National Park Service, St. Croix, Virgin Islands for A Feasibility Study to Establish the Salt River Bay Marine Research and Educational Center Draft Twenty-Year Plan for the Salt River Bay Marine Science and Education Center*. For summary purposes, these guidelines are listed below. Provision was made to include windmills for wind power as appropriate on the sites. In places where water tanks would cause an inappropriate visual impact, it is assumed that they would be partially concealed at or below grade.

The MREC facilities would include a series of buildings and other structures of approximately 35,000 square feet, not including parking, roads, and related site improvements.

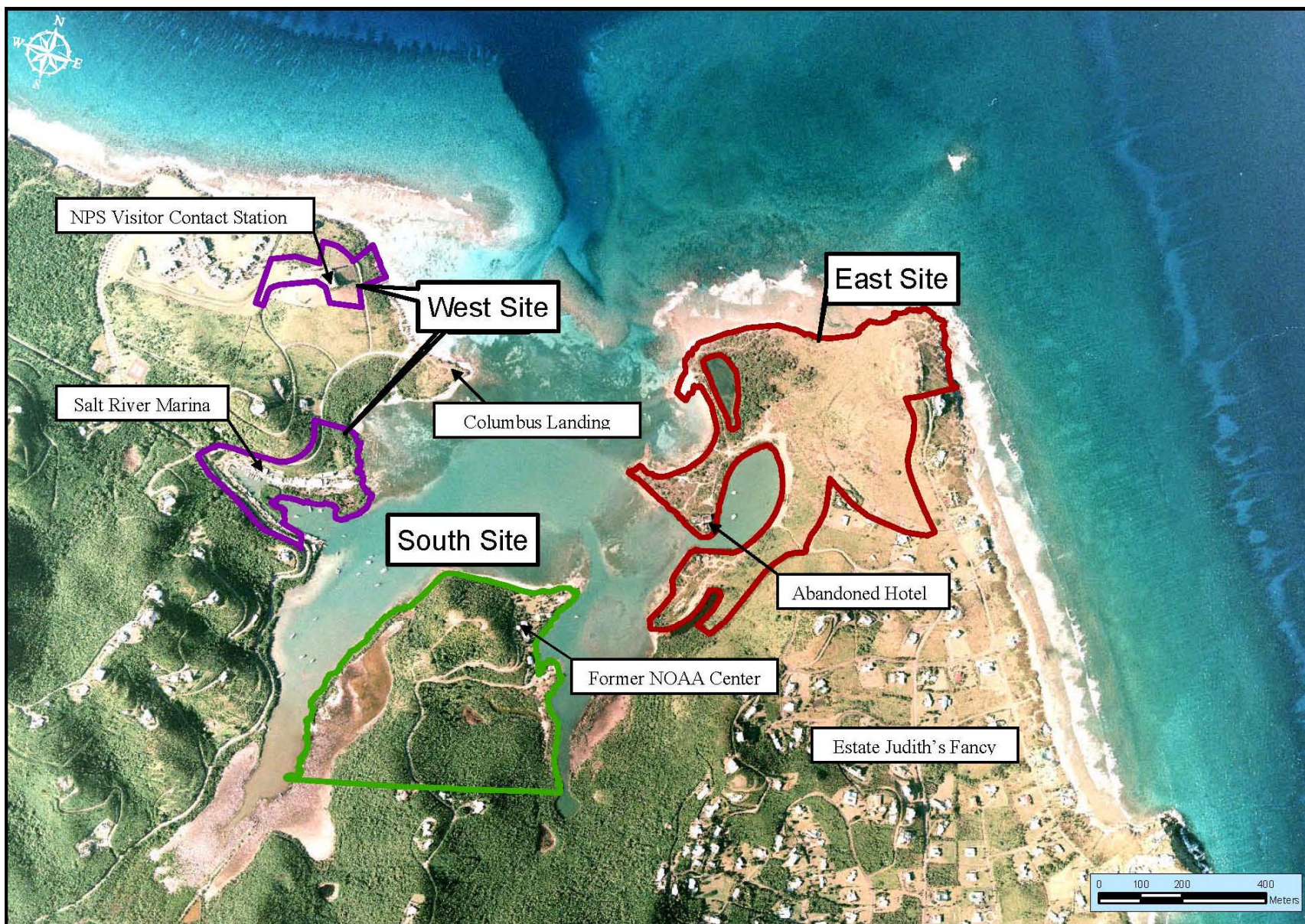


Figure 2-1. Alternative Locations for the MREC and Location of the Abandoned Hotel

The Main MREC Complex

The main complex would include:

- One large structure or a series of smaller units spread out over a larger area.
- A footprint built on a “no flood zone” and no more than two stories high.
- Three classrooms to accommodate at least 20 students each.
- Lecture and conference auditorium to accommodate at least 100 persons, wired for presentations and real-time video-audio communications.
- Large multifunctional room equipped with wireless Internet capability to serve as a library and for seminars.
- At least one teaching laboratory for 20 students with wireless Internet capability.
- A separate building with adequate space for dining and kitchen facilities to accommodate at least 100 people. This space would serve as a recreation meeting place for students and others and can be incorporated into the dormitories.
- Two administrative offices to accommodate 4-5 people with wireless Internet capability.
- Five small offices equipped with computers with wireless Internet capabilities.
- A Museum Collections Facility and preservation room to isolate preservatives.
- An interactive interpretation center with aquaria for public viewing of local species and ecosystems.
- A small data management room.
- Two climate-controlled dry labs equipped with pH meters, balances, centrifuges, research-quality compound and dissecting scopes.
- Dorms separate from the main building for thirty students and ten visiting scientists with wireless Internet capability.
- A small GIS laboratory with plotters and a satellite receiving station.
- Parking for staff and the public on site of approximately 30 to 45 spaces, depending on the site layout.

Wet Labs

According to the JICMS, the wet labs and associated teaching spaces should be separate from the main building complex. JICMS also recommended that the wet labs be close to the marine operations (boats, diving) and to the main building for convenience and to assure the shortest possible seawater lines.

In addition, the wet labs would include:

- Three small research/teaching wet labs with clean seawater available and fume hoods for handling and storing hazardous materials.
- Four outside seawater wet tables with shading.
- Two small air conditioned computer rooms equipped with at least six computers and wireless Internet capability.
- Four to five holding tanks for live organisms.

Marine Facilities

The marine facilities would include:

- Docks with space for two medium-sized vessels (25-45 ft) and four small boats (outboards), equipped with 110/220v power.
- Mooring space for 4 to 6 small boats.
- Space for a diving boat (45 ft) equipped with HP compressor, diving ladder and emergency oxygen, and two smaller dive boats.
- Two-lock decompression chamber 60 inches in diameter in a closed building.
- Full dive locker with 20 sets of gear and two HP/HV compressors and dressing area.
- Small boat and diving gear maintenance shop.
- Two small boat trailers and vehicles to reach other regions of study on the island.

Support Facilities

The JICMS proposed that several facilities be developed to support the MREC:

- Primary power should come from the St. Croix power company with redundant (2) 200KW generator sets equipped with automatic starting and switching systems.
- Installation of alternative power such as solar panels and windmills should be considered where practical and cost efficient (e.g., solar hot water systems).
- A reliable and clean seawater system is a priority and should be drawn from a region of the ocean free of contaminants and wide swings in salinity and temperature. It should be a dual parallel system of both raw and sand-filtered water. The intake should preferably come from the open ocean away from the bay tidal plume and beyond the coastal high-energy region.
- Plans for landscaping the property will include native plants, as much as possible, and the removal of non-native invasive species, as much as possible.
- High-volume rainwater collecting cisterns and a reverse-osmosis freshwater production system that produces about 3,000 gallons a day should be considered.
- A state-of-the-art sewage treatment system that assures minimum contamination of the bay, its surrounding area and the research projects is of the highest priority and needs to be above any flood zone. Composting toilets are another option for sewage treatment.

In addition, the facility would include:

- A holding tank with a 20,000-gallon capacity and capable of gravity feeding seawater to the wet labs.
- Maintenance facilities, including a well tooled workshop and small boat haul-out; this could serve as a warehouse and storage for hazardous materials.
- Roofed-over concrete containment bunkers built around fuel storage tanks and other potentially polluting liquids.

Museum Collection Storage Facility

A Museum Collection Storage Facility of approximately 5,000 square feet would be included as part of the MREC campus. This facility would contain space for collections consisting of 440,000 objects, both natural and cultural materials, including pre-historic, colonial, militaria, archeological, wet specimens, flora, herpetological, insect, geological, and archival space.

2.1.2 DESCRIPTION OF ALTERNATIVES

Care was taken to develop these alternative site concept plans in a responsible manner, given the topography of the sites, the needs of the program and the goal of creating an integrated campus environment that supports the research objectives of the facilities and encourages the public to visit and take part in its programs. However, these plans are conceptual in nature and are not intended to be an actual building program. More analysis is needed to determine the best layout and design for these facilities. They do, however, provide the basis for comparing the alternatives and identifying the primary issues that must be considered when designing the MREC at these locations.

2.1.2.1 No Action Alternative

The No Action Alternative is required for the NEPA process to review and compare feasible alternatives to the existing baseline conditions. Under the No Action Alternative, a MREC would not be constructed within the boundaries of SARI. Current activities (i.e., scuba diving, snorkeling, kayaking, and hiking) would continue at SARI if the MREC is not constructed. Unauthorized access of off-road vehicles would continue at the East Site. This activity would continue to contribute to the erosion problems at the site, ultimately to the water quality issues in the bay, and wildlife disturbances. The South Site is currently privately owned and offers no park activities, it would continue as a privately owned site. The NPS Visitor Contact Center would continue to operate at the West Site and the marina would continue to operate as a privately owned marina.

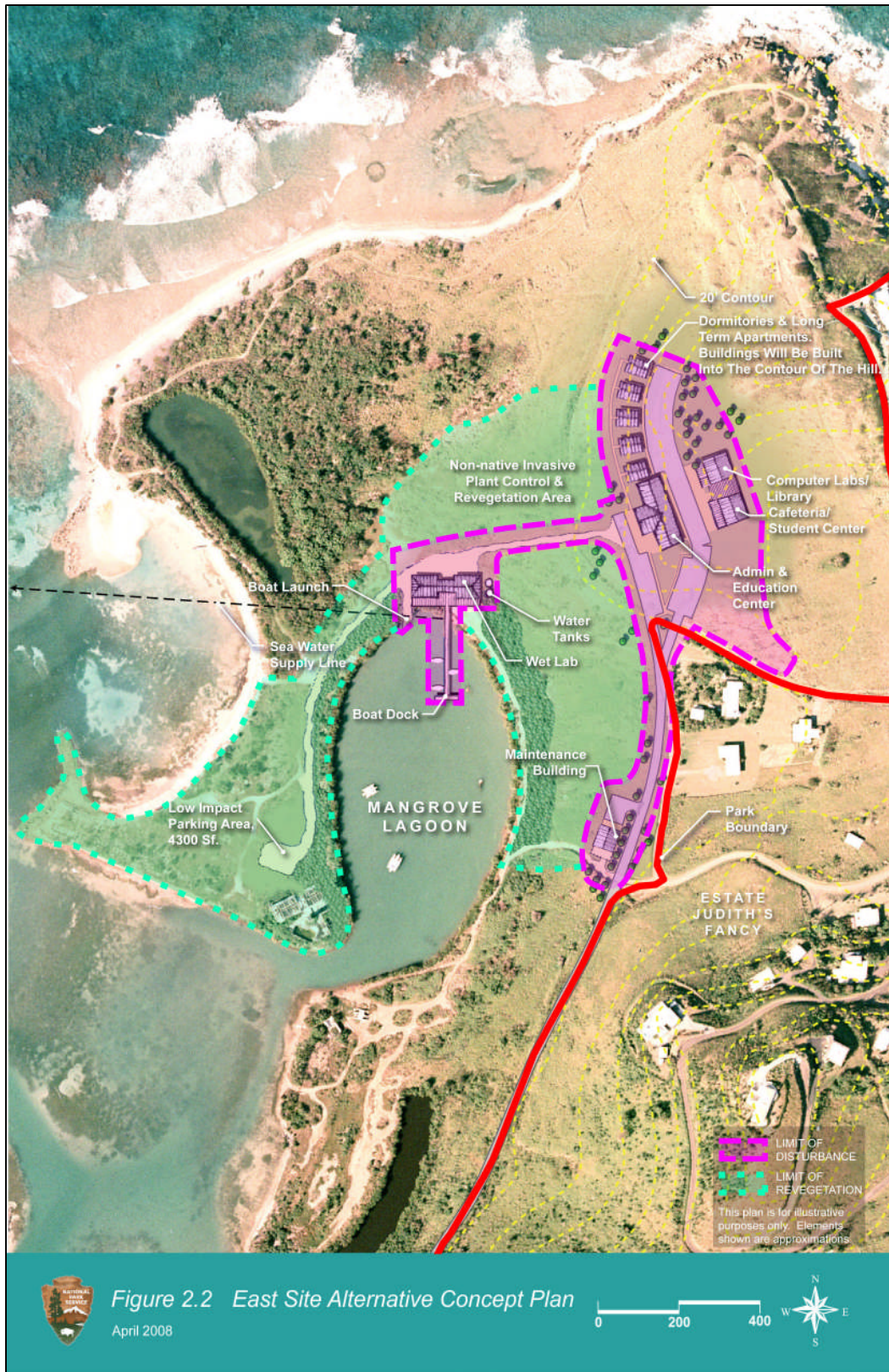
2.1.2.2 East Site Alternative (Preferred Alternative)

Figure 2-2 presents the concept plan for the Preferred Alternative (East Site) which is located within the East Site boundary location presented in Figure 2-1. Figure 2-3 presents the site access route for this alternative.

Description of Site

On the eastern side of Salt River Bay are approximately 70 acres of land owned by the NPS, adjacent to the Estate Judith's Fancy residential community. The site was previously re-landscaped by a developer in the 1960s. Several road contours were carved into a large hill about 130 feet above sea level that provides a panoramic view of the ocean and the bay. The bay side shoreline was also dramatically altered and the peninsula expanded, and a lagoon was created for a proposed boat marina. The 10-foot-deep manmade lagoon (referred to in this document as the Mangrove Lagoon) opens into Salt River Bay and is about 300 meters from the primary Bay inlet and the open ocean.

The site currently contains no structures except for an abandoned hotel structure (26,000 sq ft) located on a partially dredged and filled peninsula that extends out into the bay. Whatever historic vegetative cover that existed was removed during the 1960s development and the current landscape along the shoreline and hills is covered with non-native grasses, weedy trees, and escaped landscape plants. The area immediately adjacent to the mangrove lagoon has been eroded and denuded by unauthorized vehicle use and is now a wide open mud flat that floods during heavy rains. Surrounding the site on the east and south side are over thirty residential homes ranging in size from 1,200 to over 20,000 sq ft, most are two stories some three, and many are on a ridge line. In addition, a partially completed and abandoned canal for another proposed marina exists at southern portion of the East Site, referred to as the "Mangrove Canal."





The site is currently accessed by private paved roads that traverse a residential neighborhood (Estate Judith's Fancy) to the south and east of the NPS-owned property. The roads are circuitous and narrow. The East Site Alternative can currently be accessed by going north on North Side Road (Route 75) to Hamilton Drive (Route 751).

Site Concept Plan

The site analysis began by examining the dredge soil peninsula. Three factors led to the conclusion that the peninsula was inappropriate for construction: the fact that water surrounded it on three sides making it more susceptible to storm surge, the fact that it was made of dredged materials, and its susceptibility to seismic activity. Consequently, development planning was focused on the east side of the lagoon.

The building facilities for the MREC would be constructed at the end of an access road that would run east of the lagoon. The boat launch, water tanks and boat dock would be located on the northern end of the lagoon. East of the wet lab/boat dock and up the hill would be a parking lot for the Education Center. The cafeteria, library, and Student Center would be located across from the Education Center. To the north would be the dormitories which would be built into the hillside. To the south would be the maintenance building for vehicles and boats. A small parking area for cars and boat trailers would be located adjacent to the maintenance building. The maintenance building would be screened from the nearby community so as to minimize its visual impact. Overall, the proposed MREC buildings would blend into the natural surroundings, but would cause no more effect on the landscape than the existing surrounding residential homes. The MREC would be visible from the Columbus Landing Site and the interior of the bay, but would be shielded from the ocean.

The concept plan would also include space for a Museum Collections Storage Facility, which was added to the building program after the original concept was completed.

The seawater intake line would be either routed under the peninsula or along the Salt Pond to an appropriate intake point in the ocean. The water tanks at the lagoon would be connected by seawater supply pipeline to the MREC so the seawater would be available at the center for experimental work.

All buildings would be low profile structures and shielded by native plantings to minimize visual intrusion to adjacent residents and to the mangroves/wetlands. The buildings would be hurricane resistance. The facilities would be constructed in a location and manner to minimize the disturbance to the viewshed of the Columbus Landing site located across the bay.

There is a possibility that maintenance dredging may be needed at this location if future bathymetry studies reveal that the water depths are too shallow in the bay and/or the lagoon for research boats to reach the MREC boat dock.

Characteristics of the Site Concept Plan

The site concept plan has the following characteristics:

- The facilities would be located on the inland slopes of the main hill and slightly behind a minor spur of the hill. No development is proposed for the top of the hill.
- The Education Center would be located so that it is oriented for views across the bay of the Columbus Landing site. It also has an oblique view of the ocean.

- The Education Center would be separate and have separate parking facilities from the rest of the complex to distinguish between public and private areas.
- A sidewalk system would connect the various components of the MREC Complex (i.e., Education Center, wet lab, maintenance building, and boat dock). This sidewalk would continue down the hill and have views of the bay, forming a pedestrian connection throughout the site.
- The dormitories would be bungalow-style structures, each with balconies having unobstructed views to the bay and oblique views to the ocean.
- The cafeteria would be in very close proximity to both the Education Center and the dormitories but would not have significant views.
- Most buildings and parking would be sited so that grades would not be a major difficulty.
- The wet lab is located within the 100-year flood boundary; all other buildings are located outside of the 100-year flood boundary.
- Reforestation would partially screen the site from surrounding development. Buildings on the site would be oriented so that the surrounding development does not have a significant effect on the site.

2.1.2.3 South Site Alternative

Figure 2-4 presents the concept plan for the South Site Alternative which is located within the South Site boundary location presented in Figure 2-1. Figure 2-3 presents the site access route for this alternative.

Description of Site

The former NOAA Undersea Research Center was located on eastern shore of this site where operations for the NOAA Undersea Research Program saturation diving facilities (Hydrolab and Aquarius) were once based. The site is located between Triton Bay and Sugar Bay at the headwaters of Salt River Bay. This privately-owned, 58-acre parcel includes several structures and a bulkhead on the water for docking boats. Road access is limited to a private road that winds north to the site from the nearest public road (Route 79 - Bennie Benjamin Road).

Site Concept Plan

The cafeteria, dormitories, and Student Center would be constructed along the existing road. The Education Center would be located about 500 feet from the water's edge at a bend in the road. The road would continue along the western and northern sides of the building and continue to a drop-off area at the boat dock adjacent to the Education Center at the shoreline.

East of the Student Center would be a parking lot connecting back to the road, as well as dormitories and cafeteria building in a line roughly parallel to the Student Center parking lot.

The boat dock and Education Center would be connected to the wet lab and maintenance building by a path along the water. A second road south of the Education Center access road would be constructed to connect to a boat launch at the bay and to provide separate access to the wet lab and maintenance building. The seawater intake line would be routed through Triton Bay and Salt River Bay to an appropriate intake point in the ocean. The seawater intake system would connect directly to the wet lab.