



Cultural Resources

In addition to the natural resources described above, there are a number of cultural resources in the vicinity of BNAS, primarily in the form of historic / archaeological sites and cemeteries that could influence the location of land use recommendations for the base. Several historic sites are located immediately north of the main base along Bath Road near Jordan Avenue, and several cemeteries are found in this general area as well. **Exhibit 25: Historic and Cultural Influences Map** illustrates the location of these resources. Cemeteries are depicted as green triangles. Following that, **Exhibit 26: Historic Bowdoin College and Town Common Parcels Map**, shows the location of historic property boundaries associated with Bowdoin College and the Brunswick Town Common.

On-Base Conditions and Characteristics

Within the overall 3,300-acre BNAS property, and particularly within the more urbanized area of the base, a variety of conditions and characteristics exist that could influence or impact the ultimate successful transfer and redevelopment of the property. Understanding the characteristics of these conditions, and how to capitalize on existing assets and mitigate existing liabilities is critical to developing a reuse master plan and implementation strategy that has long-term potential for success. The following section describes a variety of on-base conditions and characteristics that provide a basic level of information required to prepare conceptual master plan alternatives for the base. The ultimate redevelopment and detailed implementation of the Reuse Master Plan will require more in-depth investigation and analysis.

Land Use Patterns

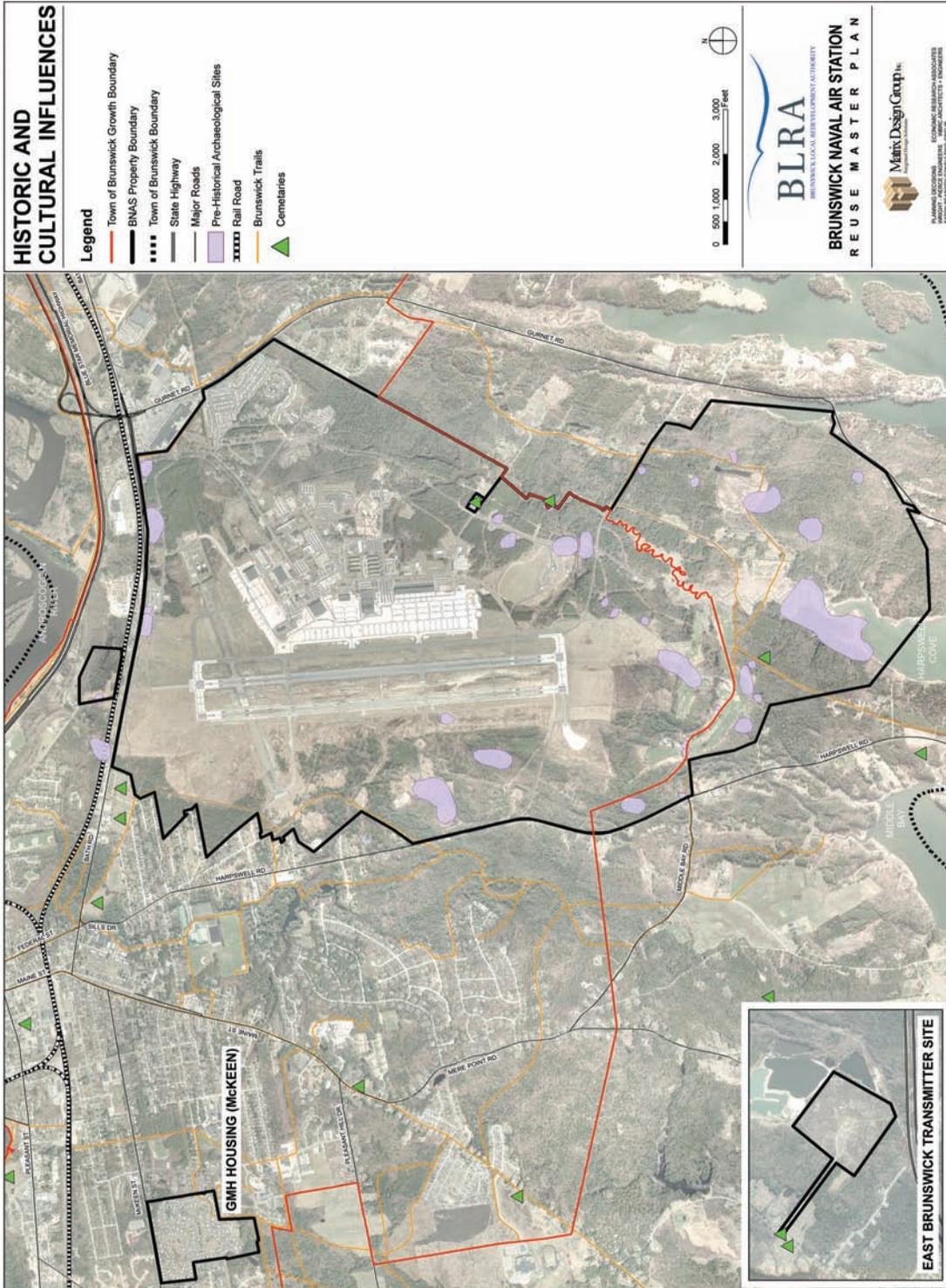
For the purposes of better understanding existing conditions and the relationships among land uses within the Brunswick Naval Air Station property, the 3,300 acres, including McKeen Homes and East Brunswick Transmitter remote sites have been classified into six broad land use categories. These include the following:

- ▶ Mixed Use
- ▶ Industrial / Aviation
- ▶ Recreation
- ▶ Residential
- ▶ Weapons Storage
- ▶ Undeveloped / Open Space

The following sections describe these uses and their respective locations within BNAS property, as illustrated on **Exhibit 27: On-Base Land Uses Map**.



Exhibit 25: Historic and Cultural Influences Map



Source: Matrix Design Group



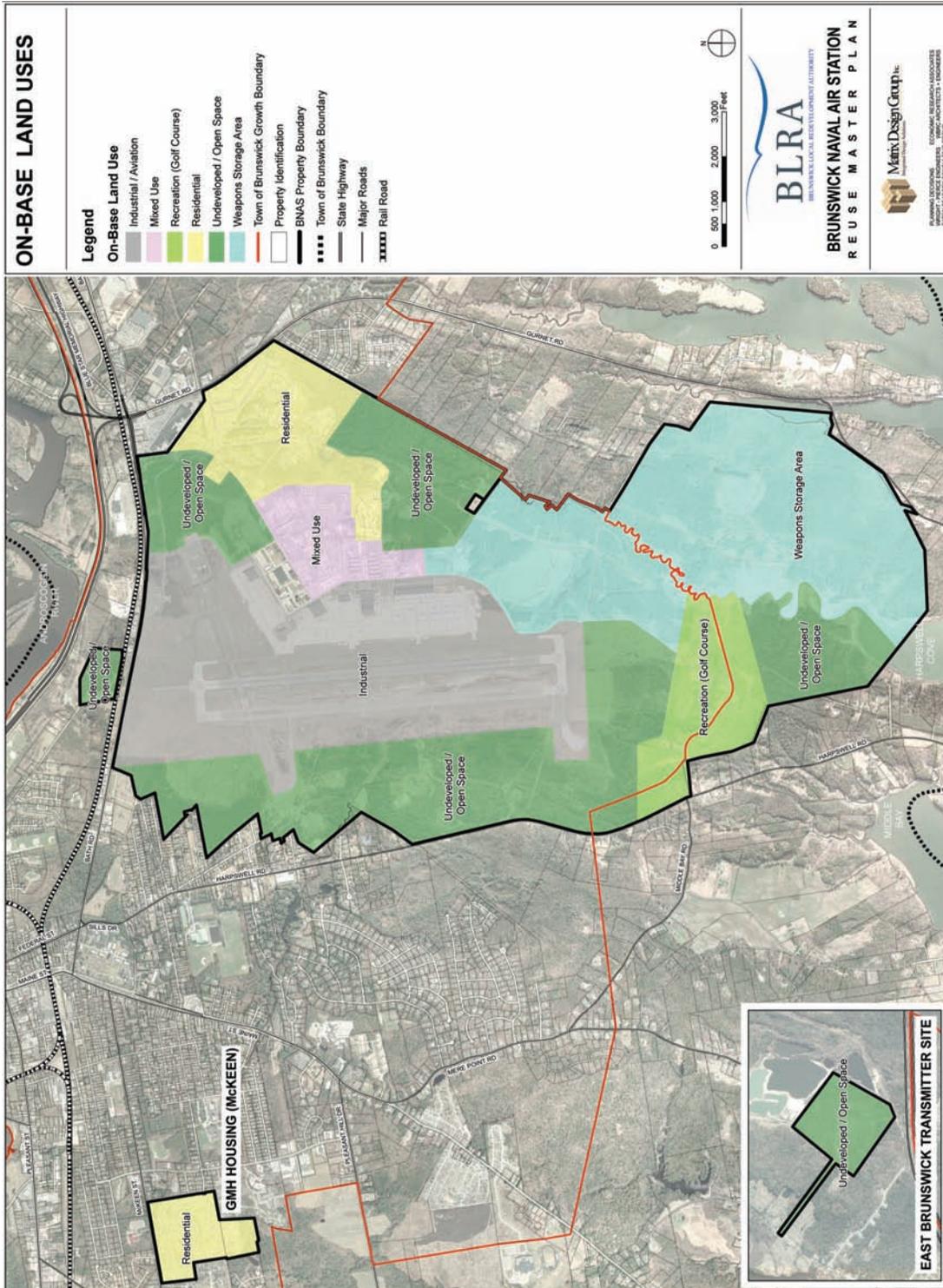
Exhibit 26: Historic Bowdoin College and Town Common Parcels Map



Source: Sitelines P.A. Engineering



Exhibit 27: On-Base Land Uses Map



Source: Matrix Design Group



Mixed Use Areas

The Mixed Use area is found in the cantonment area of the main base south of Fitch Avenue and east of Orion Street. This area is characterized by the concentration of the air station's community and administrative functions, and includes facilities such as the Base Exchange, Wing Headquarters, and Medical Center. The area is also served by major water, sewer, electrical, gas and other major utilities, as well as major streets, roadways, and surface parking lots. The Mixed Use area measures approximately 114 acres.



Industrial / Aviation Areas

The Industrial / Aviation area includes all of the existing BNAS airfield, as well as the aviation-related facilities along the northwest side of Fitch Avenue, along the west side of Orion Street, and north of the airfield along Perimeter Road. In addition to the paved



runway and taxiway areas, this area features several significant aircraft and maintenance hangars and other large industrial-type structures, as well as several smaller utility and operational / support facilities. The Industrial / Aviation area covers approximately 835 acres.



Recreation Area

The Recreation area consists of the Mere Brook Golf Course located in the southwest corner of the base. The golf course was assigned its own land use given the acreage that it occupies (approximately 181 acres) and to distinguish it from open space and other passive recreation areas nearby. Other smaller recreation uses, such as ball fields, are included within the Mixed Use area.



Residential

The Residential areas within the BNAS property are found in the northeast corner of the main base, as well as at the McKen Homes remote site. The residential areas on the main base, located immediately southeast of the Cook's Corner commercial area, consists of several neighborhoods including Marina Landing, Brunswick Gardens, Midway Terrace, and Woodland Village, and covers approximately 231 acres. This area



also includes the Permanent Party Quarters and Transient Party Quarters facilities south of the cantonment area. The McKen Homes area covers approximately 77 acres and is entirely developed as residential with the exception of some small undeveloped drainage areas.



Undeveloped / Open Space

The Undeveloped / Open Space areas are found predominantly in five locations, which include the following:

- ▶ Approximately 556 acres along the western side of the runway and north of the golf course (including the small parcel on the north side of Bath Road at the end of the runway)
- ▶ Approximately 129 acres at the southwestern corner of the base, immediately south of the golf course and west of Harpswell Cove
- ▶ Approximately 159 acres along the eastern edge of the main base, immediately south of the residential and cantonment areas
- ▶ Approximately 110 acres at the northeastern corner of the base to the west of the main gate. This area is dominated by the natural landscape of forests, wetlands, or grasslands; the limited development within this area consists typically of small utility, security, or other minor structures
- ▶ The 69-acre East Brunswick Transmitter site, which is entirely undeveloped



Weapons Storage Area

The Weapons Storage area is centered at the southeast corner of the main base, from Harpswell Cove estuary east and north to approximately the center of the base. This area covers approximately 807 acres and consists of several sites where weapons are stored and/or tested; consequently, the remaining land is undeveloped natural areas that serves to buffer these potentially hazardous areas from other uses.



Utility Infrastructure Systems

General conditions and characteristics of infrastructure systems that serve the BNAS property are described below for stormwater, sanitary sewer, water supply, natural gas, electrical power supply and distribution, and telecommunication systems. At the onset of the implementation of the Reuse Master Plan, additional inventories and assessments will be necessary to establish the extent to which these systems will need to be improved, expanded and/or extended.

Review of the utility infrastructure systems considered not only historical and existing conditions, but also future needs related to the potential redevelopment of the base. The existing infrastructure on the base, with the exception of natural gas was developed, maintained, and operated by the Navy. Based on review of available reports, discussions with BNAS Public Works staff, and from on-site observations of visible system components, it appears that utility infrastructure systems are in generally good operational condition. The existing on-base wastewater collection, water supply, natural gas, electric power and roadway systems primarily serve the “cantonment” area, that portion of the base that has been developed on the east side of the airfield, in the northeastern quadrant of the base. There are several isolated facilities, particularly toward the southern end of the property, that rely on wells and septic systems (subsurface disposal fields), rather than connection to the water and wastewater utility systems. Issues related to required improvements, acquisition, operation and maintenance of the existing utility systems include the following:



- ▶ In most cases, the utility installations at Brunswick Naval Air Station were constructed by the US Navy as needed to serve existing, expanded and new development as the base grew over time; some of the systems, therefore, may presently exist at different standards from those deemed acceptable by certain municipal, quasi-municipal or other entities that may operate these systems in the future.
- ▶ Utility use at some locations and facilities within the base are not metered; it is anticipated that all future development will need to be provided with meters as a part of the infrastructure improvement program.
- ▶ There are no defined rights-of-way for the road and utility infrastructure.
- ▶ Utilities are not always located in the defined roadway corridors and may be impacted by land transfer and/or future development.
- ▶ Utility operations (gas, water, telecommunications and electrical) will be subject to certain rules and regulations by the Maine Public Utilities Commission (MPUC), after the property is transferred and the base is redeveloped.

The following information summarizes the issues related to the major utility systems that serve the base:

Stormwater Management Facilities

Stormwater management facilities on the base vary widely in nature, with more sophisticated systems serving the northern and eastern portions of the site, where uses have been more intensive and there has been a correspondingly higher potential for discharge of contaminants. According to the *Environmental Condition of Property Report (Revision 2)* for Naval Air Station, Brunswick, Maine (ECP Report) dated May 30, 2006, a National Pollutant Discharge Elimination System (NPDES) permit was applied for in 1992 and received from the United States Environmental Protection Agency (USEPA) Region 1. In 1995 the USEPA developed a system called Multi-Sector permitting, and in December of that year BNAS issued a Notice of Intent to apply for the permit. As required, in five years (2000) a Notice of Intent was submitted and the permit was approved in 2001. In October, 2005 (as required) a Notice of Intent was submitted and reissuance of the permit was pending as of the date of the ECP Report. Since existing stormwater detention facilities are licensed under MEDEP, that agency notified the Naval Air Station in July, 2006 that they were authorized to discharge stormwater associated Multi-Sector activity pursuant to the terms and conditions imposed by the DEP's Multi-Sector General Permit for stormwater associated with industrial activity. The facility permit number is MER05B247. The Multi-Sector General Permit for Stormwater must be transferred to any new operating entity of the BNAS property and renewed every five years thereafter. All future development will be required to meet requirements of Maine and federal stormwater regulations.



Wastewater Collection System

The existing wastewater collection system adequately serves the majority of the developed portion of the site. The system was constructed by the US Navy, which currently operates and maintains the system. Wastewater is discharged to the Brunswick Sewer District and is metered as it leaves the base along the Bath Road at the Main Gate. **Exhibit 28: Wastewater Collection System Map** illustrates the area served by this system. Records reviewed indicate that facilities were constructed as early as the 1940s. Materials vary depending on the time period within which they were constructed.

As part of the inventory and analysis of existing base conditions, a preliminary assessment of the existing wastewater collection system was conducted by the Matrix Planning Team, with support from representatives of the Brunswick Sewer District, the local service provider. The assessment included a review of available mapping and past assessment reports, as well as discussions with BNAS Public Works staff, and on-site observation of the ten wastewater pumping stations. On the basis of this assessment, it was estimated that the improvements necessary to bring the existing collection system up to local District standards could be as high as \$6.4 million. This estimate includes limited improvements to only six of the ten pump stations examined; four of the pump stations were site-specific, serving a single area / facility. Improvements of these systems might best be the responsibility of the end user of each facility.

It is important to note that, from a wastewater treatment capacity perspective, the Brunswick Sewer District has indicated that it possesses the ability to accept average daily flows up to 0.3 million gallons per day (MGD). Future discharges in excess of this figure may require upgrade to the District's downstream pumping and treatment facilities. The licensed treatment capacity of the Brunswick Sewer District's treatment plant is 3.85 MGD. With the addition of a third secondary clarifier and a third trickling filter the Brunswick Sewer District has indicated that it may be able to increase the licensed treatment plant capacity to 5.7 MGD at a cost of approximately \$ 8 million. According to BNAS Public Works staff, and as determined as part of the records review and site observation activity, it was also noted that the sewer system that serves Mariner Landing, the privatized residential housing area located on the west side of Route 24, adjacent to the Cook's Corner Shopping Center, experiences flooding of sewers from the manhole located in the low point of the roadway. Anecdotal evidence exists with respect to a problem with grease build up in a sewer line in the area of the galley. It also appears that infiltration / inflow could be a problem, based on flow meter readings.



Exhibit 28: Wastewater Collection System Map



Source: Wright-Pierce Engineers



Water Supply System

The existing water supply and distribution system adequately serves the majority of the developed portion of the site. The system was constructed by the US Navy, which currently operates and maintains the system. Water is provided by the Brunswick-Topsham Water District (BTWD) and is metered at two separate locations as it enters the base, as illustrated on **Exhibit 29: Water Distribution**. Records indicate that facilities were constructed as early as the 1940s. Construction materials varied, depending on the time period that they were constructed. The capacity of the water supply system is limited by two 10-inch metering points, located in the Bath Road and Pine Street area. Areas to the south of the cantonment area are not connected to the primary water distribution system, but are served by local wells and hydropneumatic systems.

As part of the inventory and analysis of existing base conditions, a preliminary assessment of the existing water distribution system was conducted by the Matrix Planning Team, with support from representatives of the BTWD, the local service provider. The assessment included a review of available mapping and past assessment reports, as well as discussions with BNAS Public Works staff, and on-site observation of visible systems components. On the basis of this assessment, it was estimated that the improvements necessary to bring the existing system up to local District standards could be as high as \$ 9.1 million.

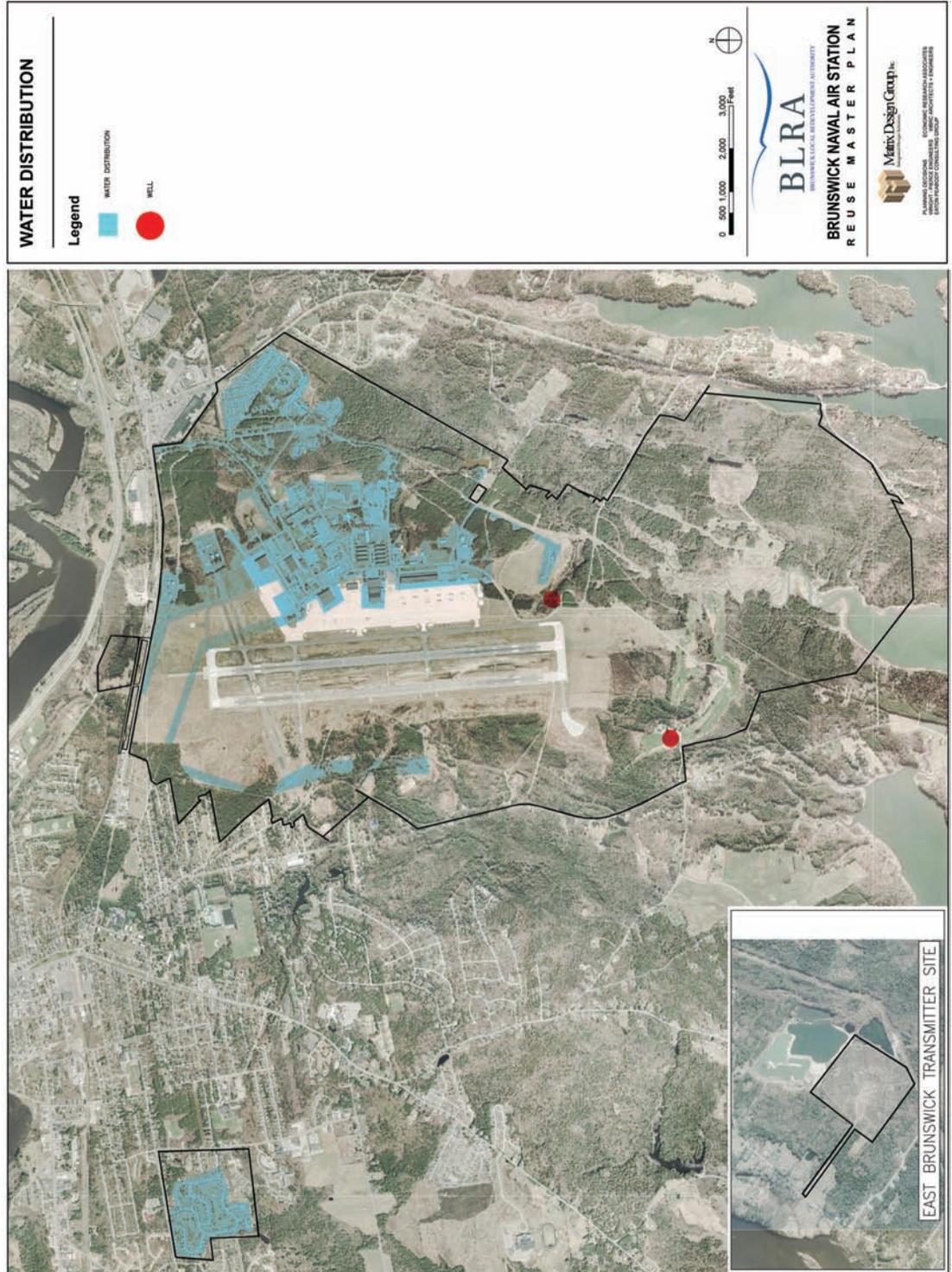
It is important to note that, from a water supply capacity perspective, the BTWD has indicated that it has the ability to supply flows up to 90,000 gallons per day (GPD), the level historically used by the base, without negatively impacting its system. The BTWD has indicated that the current system has the capacity to provide an additional 1.5 million gallons per day (MGD) to the Brunswick-Topsham area. The District has further indicated that the reserve system capacity is allocated on a “first come, first served” basis. Future demand in excess of the allowed capacity may require upgrade to the District’s pumping and treatment facilities.

Water System Ownership and Operating Alternatives

The following discussion details potential ownership and operating alternatives for the existing base water distribution system. Each alternative brings with it varying degrees of regulatory, and operation and maintenance responsibilities. Each alternative also assumes that water would continue to be supplied by the BTWD in compliance with all State and Federal water quality requirements. BTWD is required to monitor, treat and remove source based contaminants from the drinking water supplied to its customers. Under current operating conditions, the US Navy is simply considered a “customer” of the BTWD, and is not subject to regulatory monitoring requirements.



Exhibit 29: Water Distribution Map



Source: Wright-Pierce Engineers



Status Quo Scenario

Under the status quo, the MRRRA would simply replace the Navy as the bulk water “customer” of the BTWD, and existing BNAS distribution system assets would remain under the ownership and operation of the MRRRA. It is assumed that the MRRRA would be responsible for the purchase cost of all water-use on the base. The MRRRA would also be responsible for the operation and maintenance of all mains, valves, hydrants and services. There would be no other changes or additional regulatory requirements of the MRRRA under this scenario.

“For Profit” Operating Entity Scenario

Under a “for profit” scenario, the MRRRA would retain ownership of the system and/or transfer the rights of the system to a “for profit” operating entity. It is assumed that water would continue to be provided and billed under a wholesale arrangement with the BTWD; however, the MRRRA or “for profit” operating entity would pass along the costs to individual users. This assumes that this “for profit” entity would install individual meters on each service line or create user charge system. It would also be responsible for the operation and maintenance of all mains, valves and services. Currently, the BNAS is not subject to monitoring of distribution water quality. However, if future users were charged a fee for providing water, or if the Brunswick-Topsham Water District selected the base water system as one of its lead and copper or coliform monitoring sampling sites, the property would be considered a “consecutive water system.” A consecutive water system is defined as a public water system that receives all of its water from a host or wholesale system that is also a public water system; where the consecutive water system does not provide treatment. The consecutive water system is not technically integral to the wholesale system. If deemed a Consecutive Water System, the MRRRA would be required to monitor for contaminants which are generated in the distribution system following treatment by the wholesaler (i.e., lead and copper, coliform, etc.), as well as monitoring for disinfection by-products as defined in the 2005 Disinfectants / Disinfection By-Products Stage 2 rule. In addition, the MRRRA would be required to comply with the Public Health Security and Bioterrorism Preparedness and Response Act of 2002. These rules would require the MRRRA to develop a Vulnerability Assessment Certification and Emergency Response Plan in accordance with the Act.

Brunswick-Topsham Water District Ownership Scenario

Under this scenario, the MRRRA would likely be required to satisfy a number of requirements of the BTWD, which could include the following:

- ▶ Documentation that mains have been constructed in accordance with the materials and construction standards of the BTWD



- ▶ Demonstration of minimum separation requirements between potable water and sewer mains as defined by the State of Maine (potable water mains must be separated from sewers by a minimum of 10 feet horizontally and 18 inches vertically. Where these requirements cannot be achieved, the owner of the system would be required to obtain a waiver from this requirement)
- ▶ Documentation of the location of all mains, fittings, valves and service connections
- ▶ Demonstration of compliance with the State of Maine Cross Connection Rules
- ▶ Provision of water service meters in compliance with the BTWD's standards
- ▶ Transfer of the BNAS assets to the BTWD in compliance with "Chapter 65 - Property Taken for Public Use and Assessment of Damages" of the Maine Public Utilities Commission rules
- ▶ Prohibition by BTWD of including assets in calculating the depreciation rate base (the BTWD would simply fold the assets into their system)

Electric Power Supply and Distribution System

The existing electric power distribution system adequately serves the majority of the developed portion of the site. The system was constructed by the US Navy, which currently operates the system. Power is provided by Central Maine Power Company and is metered as it enters the base from the east along Route 24 and from the west along Route 123. The westerly metering system serves only the facilities on the west side of the runway. Records indicate that facilities were constructed as early as the 1940s; materials varied, depending on the time period that they were constructed.

As part of the inventory and analysis of existing base conditions, a preliminary assessment of the existing electric power distribution system was conducted by the Matrix Planning Team, with support from representatives of Central Maine Power Company (CMP), the local service provider. The assessment included discussions with BNAS Public Works staff, and on-site observation of visible systems components. While it appears from initial observations that much of the system meets or exceeds Central Maine Power Company's standards, a more detailed review would be required to verify this assumption. On the basis of this more detailed assessment CMP is expected to identify improvements necessary to bring the existing system to bring the existing system up to local standards. CMP's review will also identify any regulatory and/or operational issues that will have to be addressed as part of any transfer of ownership. Once the system assessment has been completed, a cost estimate will be prepared for the improvements identified to make the electrical distribution system compliant with CMP requirements.



Natural Gas Distribution System

The existing natural gas distribution system adequately serves the majority of the developed portion of the site. The system was installed on the base in 2001-2002 and has been owned, maintained and operated by Maine Natural Gas (MNG) since that time. As a result, the system meets all required local standards, and will not require any substantive upgrade for continued operation by that utility. The system has been extended to serve the new Dyers Gate facility to the south, as well as the new Air Control Tower to the west. **Exhibit 30: Natural Gas Distribution Map** illustrates the area serviced by natural gas using an orange color.

Maine Natural Gas has indicated that sufficient reserve capacity exists to serve foreseeable additional development that may take place on the BNAS site, although the metering and regulation station located on BNAS property along the Bath Road may require modifications to meet the future natural gas demands. There is a master gas meter on base as well as meters located at some industrial / commercial facilities, and therefore all structures may not have a dedicated gas meter. The residential housing units are separately metered. The existing Maine Natural Gas metering and regulator station that serves the base, the Cook's Corner area, and East Brunswick, is located adjacent to Bath Road on BNAS property. Maine Natural Gas would continue to own and operate their existing facilities to serve future development.

Telecommunications Systems

There are presently at least two separate telecommunications systems serving the majority of the developed portion of the site. Verizon Communications provides service to the base, and the base then provides communication service to their facilities via fiber optic and cable lines. Verizon Communications has indicated that it will continue to provide service to BNAS and is willing to take ownership of the government-owned portions of the communications system.



Exhibit 30: Natural Gas Distribution Map



Source: Wright-Pierce Engineers



Vehicular Access and Street System

The Brunswick Naval Air Station property is presently served by a system of internal streets and roadways that provide access primarily to the cantonment area of the base, where a majority of the development exists. While vehicular access is provided to more remote areas of the base, such roadways are generally unimproved, and limited in terms of public access. Major portions of the base, located primarily in the southern portions of the property are not accessible by vehicle.

The Main Gate is located just off Bath Road, west of the Bath Road / US 24 intersection that serves the Cook's Corner commercial area. Fitch Boulevard, a four-lane facility serves as the main arterial roadway into the cantonment area. Currently, a security checkpoint is located approximately 500 feet from the entrance at Bath Road. For



visitors without approved pass and decal badges, security checks must be processed at Building 38, a new facility constructed in 2004 on the west side of Fitch Boulevard; the former pass building on Bath Road is used for other security purposes.

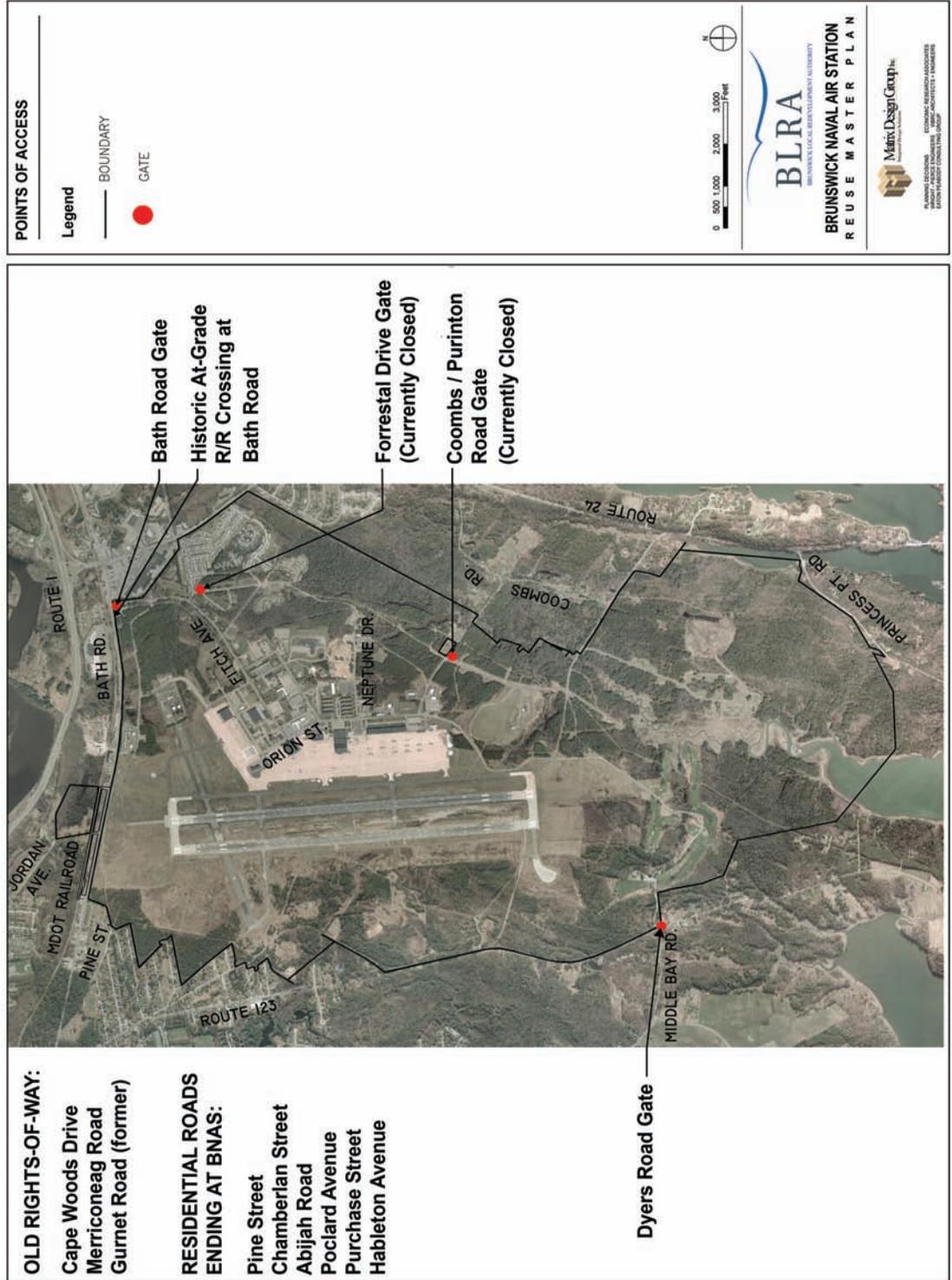
Vehicular access from the south is limited to the Dyer

Gate, located off Harpswell Road on the western side of the base. Dyer Road also provides access to BNAS's 9-hole Mere Brook Golf Course, which is open to the public. The security checkpoint for access into the main portion of the base from Dyer Road is located 1.4 miles east and north of the golf course. **Exhibit 31: Points of Access Map** illustrates the vehicular access points serving the property, only two of which are currently in use.

The existing network of streets and roadways within the base property varies in standard based on the purpose served. In general, streets within the cantonment area are bituminous-surfaced, with storm drainage and granite curbing. Sidewalks are present in many areas. In the more "rural" portions of the base property, particularly the areas to the south and the northwest, the roadways are not curbed and rely on open ditches and culverts for storm drainage. Sidewalks are generally not present within these areas. Given the present use of the site, the internal streets and adjacent street network provide adequate capacity. Some routine maintenance of the streets may be appropriate.



Exhibit 31: Points of Access Map



Source: Wright-Pierce Engineers



McKeen Street Housing Area

The following information on utilities is provided for the McKeen Street Housing Area:

- ▶ The wastewater system is connected to the public sewer system and disposed of by the Brunswick Sewer District. The condition of sewers is expected to be similar to those within the base cantonment area.
- ▶ The water supply system is connected to the public water system by the Brunswick-Topsham Water District. The condition of the water system is expected to be similar to that within the base cantonment area.
- ▶ Natural gas is provided to each residence within the housing complex by Maine Natural Gas.
- ▶ Electric power is provided to the property by Central Maine Power.
- ▶ Vehicular access is provided to the McKeen Street Housing Area via a private internal street network that connects to the municipal street system at several locations. The streets are bituminous surfaced with storm drainage, granite curbing, and sidewalks. Given the present nature of use of the site, the internal streets and adjacent street network provide adequate capacity. Some routine maintenance of the streets may be appropriate.

Potential Infrastructure Improvement Costs

While current infrastructure systems provide adequate service for operation of the BNAS facility, future private-sector redevelopment activities will likely require significant improvements to bring systems up to local standards, and to meet expectations of the market place. “Order of Magnitude” estimates of capital costs, therefore, have been provided. This level of information will enable area public service providers and/or other entities to make infrastructure acquisition and/or operational decisions as part of the formulation of future implementation strategies. It should be noted that such estimates do not include secondary and tertiary upgrades or site improvement costs that might be associated with specific building demolition or construction, parking and/or landscaping improvements, or other detailed cost estimates associated with specific future project development. As noted elsewhere in this document, the future use of the airport facilities remains undetermined at this point in the process; capital costs associated with its continued operation is addressed separately, by others.

The cost of utility and infrastructure upgrades include: (1) those that are needed simply for new distribution, such as new development areas that previously had no utilities or road access; and, (2) costs that are needed to upgrade an existing system based on substandard conditions and/or added demand. All projections of capital costs in this section of the report are “Order of Magnitude” and for budgetary purposes only; specific items have been identified as part of those opinions of probable costs. Assumptions



of size, type, materials and unit costs of components have been developed based on past experience in the region. No detailed design has been performed to support these opinions.

Current estimated costs to upgrade utility systems without any expansion to address any future land use changes are based on review of the nature and condition of existing sanitary sewer, water, and electric power distribution systems, as well as a review of local standards and requirements in order to operate, maintain, and/or acquire the systems by the Brunswick Sewer District, the Brunswick-Topsham Water District, and/or Central Maine Power, respectively. Estimated improvement costs for these systems include:

- | | |
|---------------------------------------|--------------------|
| ▶ Sanitary Sewer System | \$6.4 million |
| ▶ Water System | \$9.1 million |
| ▶ Electric Power Distribution System | (to be determined) |
| ▶ Steam Distribution System (Removal) | \$4.0 million |
| ▶ Natural Gas System | (n/a) |

Regarding the Steam Distribution System Removal line item above, there are approximately 18,500 linear feet of steam lines and 78 steam pits that potentially contain asbestos insulation.

Buildings and Facilities

As a major part of the study's inventory and analysis of existing conditions, a Building and Facilities Assessment was conducted for the most significant of the BNAS building resources. The purpose of the study was threefold: (1) to identify and document significant buildings and facilities that might be considered for similar or adaptive reuse in the future; (2) to determine the extent of conditions and characteristics that might impact a building's cost-effective utilization or adaptive reuse; and, (3) to provide a standard method and format to document the data for use during this planning study, and for future marketing of the building and facility resources.

During the data collection and building and site inventory process, Matrix Design Group Planning Team members (specifically, representatives from Bangor-based WBRC Architects and Engineers), obtained in excess of six gigabytes of digital information, comprising over 5,000 record documents (drawings, databases, environmental reports) associated with the study area. The review of the data and resulting summaries are based in large part on data and information provided by the US Navy through the Computer Aided Design (CAD) and Geographic Information System (GIS) it maintains, as well as information obtained during a series of on-site Property Conditions Assessment (PCA) building walkthroughs. More detailed data on many individual facilities, such as