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Methodology, Assumptions, and Multipliers

Methodology, Assumptions, and Multipliers Utilized in the Environmental Consequences Analysis

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DEPARTMENT OF THE NAVY

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FEDERAL AVIATION ADMINISTRITON

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Introduction

This appendix describes the methodology, assumptions, and multipliers used to develop the population, construction cost, employment projections and indirect, off-base impacts provided in Section 4.2 – Socioeconomic Environmental Consequences. In addition, similar details are provided for the water supply and wastewater projections presented in Section 4.8 – Infrastructure. It should be noted that the methodology and assumptions used in calculating the housing projections presented under the socioeconomic resource area are discussed in Appendix C as part of the build-out analysis.

In order to provide a concise and easy-to-follow discussion of the potential impacts of implementing Alternative 1, Alternative 2, or the No Action Alternative on these resource areas, only the summary tables and results were provided in the text of the EIS. The balance of the information is provided in this appendix, which is organized into the following sections:

- N-1 – Methodology and Assumptions for Population Projections
- N-2 – Methodology and Assumptions for Construction Cost Calculations
- N-3 – Methodology and Assumptions for Employment Projections
- N-4 – Methodology and Assumptions for Indirect/Induced Off-base Impacts
- N-5 – Methodology and Assumptions for Water Supply and Wastewater
- N-6 – Methodology and Assumptions for Impervious Surface Area Projections

In each of these sections, the methodology and assumptions utilized are discussed. The terms and definitions used in the analysis are presented, and detailed tables showing calculations and results are provided.

N-1 Methodology and Assumptions for Population Projections

The build-out analysis (see Appendix C) separated redevelopment of NAS Brunswick into six land use districts: Aviation-Related, Community Mixed Use, Professional Office, Business and Technology Industries, Education, and Residential.

According to the build-out analysis, two of these land use districts support reuse of existing and/or construction of new residential units: Community Mixed Use and Residential. The build-out analysis outlines the quantity of each housing type (e.g., single-family detached, townhome, etc.) that is assumed to be re-used/constructed and fully occupied during the phased redevelopment after 5-, 10-, 15-, and 20-years.

Housing units are broken down into five sub-categories (single-family homes detached, townhomes/condos, apartments, student housing, and senior housing) and then further grouped by number of bedrooms (e.g., 2-bedroom apartment; 5-bedroom single-family home detached, etc.).

Residential demographic multipliers were obtained for each residential unit from a Rutgers University publication, which provided information specific to the State of Maine (Rutgers University 2006). The residential demographic multipliers that were applied to each of the five housing sub-categories in this analysis are presented below:

- **Single-Family Unit Detached**
  - 2 Bedroom: *2.17 residents per unit*
  - 3 Bedroom: *3.01 residents per unit*
  - 4 Bedroom: *3.69 residents per unit*
  - 5 Bedroom: *4.09 residents per unit*
- **Townhome/Condo**
  - 2 – 4 Bedrooms: 1.57 residents per unit
- **Apartments**
  - 1 Bedroom: 1.05 residents per unit
  - 2 – 4 Bedrooms: 2.12 residents per unit
- **Student Housing**
  - 1 Bedroom: 1.05 residents per unit

- **Senior Housing**
  - 1 Bedroom: 1.05 residents per unit

The residential demographic multiplier assumes that all senior apartments contain only 1 bedroom per unit and that all apartments are rental units. Projected housing units presented in the build-out analysis (see Appendix C) were multiplied by the housing type-specific residential demographic multiplier to estimate the number of residents that would live in the units. It was assumed that all new housing units would be populated by peopled moving into the Brunswick LMA. This implies that no one in the current population of the Brunswick LMA will move onto the installation and all projected population represents growth in the area.

Population projections are based on the full build-out of the property under Alternative 1, Alternative 2, and the No-Action Alternative and the full occupancy of all residential units. The final build-out is a best-case projection of future conditions based on planning assumptions and applicable land use zoning regulations.

Example of Calculation

The same methodology used to calculate the projected population was used for all residential units. The only component that differs in each equation is the value of the residential demographic multiplier. As an example, under Alternative 1 and Alternative 2, 5 years after the start of redevelopment it is expected that there would be 31 single-family 2-bedroom detached units. The residential demographic multiplier for such units is 2.17 residents per unit. By multiplying 31 units by 2.17 residents per unit, a total estimated population growth of 67.27 results, which rounds to 67 residents.

[31 Units x 2.17 residents/unit = 67.27 residents (round to 67 residents)]

The same process was completed for each 5-year increment of the phased redevelopment period and for all residential units. After 10 years, it is estimated that there will be 62 single-family detached 2-bedroom units. The residential demographic multiplier does not change, resulting in the following calculation:

[62 Units x 2.17 residents/unit = 134.54 residents (round to 135 residents)]

All calculations are cumulative throughout this analysis. Using the same example as above, it is not expected that there will be an additional 135 residents, but rather at 10-years after the start of redevelopment there would be a total of 135 residents for this housing type. This number includes the 67 residents that are estimated for the initial 5-year period.

Population Projection Results

Tables N-1, N-2, and N-3 show the population projections based on residential units for Alternative 1, Alternative 2, and the No-Action Alternative, respectively. The results of each calculation through the phased build-out are cumulative; therefore, the 20-year projection shows a total estimated population projection based on the alternative and the build-out analysis.

Table N-1 Alternative 1 – Residential Build-out and Population Projections

Residential Unit	5 Years	10 Years	15 Years	20 Years	Residential Demographic Multiplier[a]	5 Years	10 Years	15 Years	20 Years
Single-family, detached (2 bedrooms)	31	62	92	123	2.17	67	135	200	267
Single-family, detached (3 bedrooms)	39	79	118	157	3.01	118	238	355	473
Single-family, detached (4 bedrooms)	17	33	50	66	3.69	61	122	185	244
Single-family, detached (5 bedrooms)	1	2	2	3	4.09	3	8	8	12
Sub-total Single-family Detached	**87**	**176**	**262**	**349**	**Sub-total Population**	**249**	**502**	**748**	**995**
Townhome/condo (2 to 4 bedrooms)	56	112	168	224	1.57	88	176	264	352
Apartment (1 bedroom)[b]	65	162	325	649	1.05	68	170	341	681
Apartment (2 to 4 bedrooms)[b]	148	351	621	1,162	2.12	314	744	1,317	2,463
Sub-total Townhome/Condo and Apartments[b]	**269**	**625**	**1,114**	**2,035**	**Sub-total Population**	**470**	**1,090**	**1,922**	**3,497**
Senior apartments (1 bedroom)[b,c]	43	108	129	129	1.05	45	113	135	135
Student apartments (1 bedroom)[b]	65	129	216	433	1.05	68	135	227	455
Sub-total Student and Senior Apartments (1 bedroom)[b,c]	**108**	**237**	**345**	**562**	**Sub-total Population**	**113**	**249**	**362**	**590**
Total[d]	**464**	**1,038**	**1,721**	**2,946**	**Total Population**	**832**	**1,841**	**3,031**	**5,082**

Notes:
[a] Residents per unit.
[b] Assumes apartments are rental units.
[c] Assumes student and senior apartments contain only 1 bedroom per unit.
[d] Totals may not be exact due to rounding.

Table N-2 Alternative 2 – Residential Build-out and Population Projections

Residential Unit	5 Years	10 Years	15 Years	20 Years	Residential Demographic Multiplier[a]	5 Years	10 Years	15 Years	20 Years
Single-family, detached (2 bedrooms)	31	62	92	123	2.17	67	135	200	267
Single-family, detached (3 bedrooms)	91	208	377	676	3.01	274	626	1,135	2,035
Single-family, detached (4 bedrooms)	34	76	136	239	3.69	125	280	502	882
Single-family, detached (5 bedrooms)	1	2	2	3	4.09	4	8	8	12
Sub-total Single-Family Detached	**157**	**348**	**607**	**1,041**	**Sub-total Population**	**471**	**1,049**	**1,844**	**3,196**
Townhome/condo (2 to 4 bedrooms)	73	155	254	397	1.57	115	243	399	623
Apartment (1 bedroom)[b]	195	487	975	1,949	1.05	205	511	1,024	2,046
Apartment (2 to 4 bedrooms)[b]	365	892	1,705	3,329	2.12	774	1,891	3,615	7,057
Sub-total Townhome/Condo and Apartments[b]	**633**	**1,534**	**2,934**	**5,675**	**Sub-total Population**	**1,093**	**2,646**	**5,037**	**9,727**
Senior apartments (1 bedroom)[b,c]	72	148	166	203	1.05	76	155	174	213
Student apartments (1 bedroom)[b]	130	325	650	1,300	1.05	137	341	683	1,365
Sub-total Student and Senior Apartments (1 bedroom)[b,c]	**202**	**473**	**816**	**1,503**	**Sub-total Population**	**212**	**497**	**857**	**1,578**
Total[d]	**992**	**2,355**	**4,357**	**8,219**	**Total Population**	**1,776**	**4,192**	**7,738**	**14,501**

Notes:
[a] Units residents per unit.
[b] Assumes apartments are rental units.
[c] Assumes student and senior apartments contain only 1 bedroom per unit.
[d] Totals may not be exact due to rounding.

Table N-3 No-Action Alternative – Residential Build-out and Population Projections

Residential Unit	Existing	Residential Demographic Multiplier[a]	Projected Population
Single-family, detached (2 bedrooms)	123	2.17	267
Single-family, detached (3 bedrooms)	157	3.01	473
Single-family, detached (4 bedrooms)	66	3.69	244
Single-family, detached (5 bedrooms)	3	4.09	12
Sub-total Single-Family Detached	**349**	**Sub-total Population**	**995**
Townhome/condo (2 to 4 bedrooms)	224	1.57	352
Apartment (1 bedroom)[b]	0	1.05	0
Apartment (2 to 4 bedrooms)[b]	0	2.12	0
Sub-total Townhome/Condo and Apartments[b]	**224**	**Sub-total Population**	**352**
Senior apartments (1 bedroom)[b,c]	0	1.05	0
Student apartments (1 bedroom)[b]	0	1.05	0
Sub-total Student and Senior Apartments (1 bedroom)[b,c]	**0**	**Sub-total Population**	**0**
Total[d]	**573**	**Total Population**	**1347**

Notes:
[a] Units residents per unit.
[b] Assumes apartments are rental units.
[c] Assumes student and senior apartments contain only 1 bedroom per unit.
[d] Totals may not be exact due to rounding.

N-2 Methodology and Assumptions for Construction Cost Calculations

Based upon the build-out analysis for Alternative 1 and Alternative 2, as presented in Appendix C, construction costs were estimated utilizing general "cost-per-square-foot" multipliers and a series of assumptions. The assumptions and references utilized and detailed calculation tables are presented in this subsection.

Assumptions

For residential construction, the number of units proposed under each build-out scenario was used to estimate the total square footage of residential space by type (e.g., single-family detached, townhome/condo, etc.). A cost per square foot was then applied to the square footage figure. No construction costs are associated with existing housing units proposed for reuse.

For non-residential space, the build-out analysis provided square footage figures by land use type (e.g., civic and cultural, office, etc.). A cost per square foot was then applied to the square footage figure by type. No construction costs are associated with existing non-residential buildings proposed for reuse.

All cost figures were originally calculated in 2009 dollars and are presented in Tables N-4 and N-5. For the purposes of this analysis, it is assumed that construction will begin in 2011 and construction spending will occur evenly throughout the 20-year build-out of the former installation (until 2030).

As noted previously, square footages for existing facilities were not included in the total construction cost estimates, even though some renovation may be required for these buildings to accommodate their future uses. The amount of work required for renovation was unknown and could not be quantified, and it was assumed that these costs would be nominal compared with construction of new facilities.

Construction cost figures per square foot were obtained from R.S. Means (R.S. Means 2009), which is a national source of construction cost information. A regional multiplier was used to mark-up the cost figures to be more appropriate for the State of Maine. The calculations that resulted were for total construction at full-build out in 2009 dollars (see Table N-4 and N-5). These figures were then divided evenly over the 20-year build-out period. An inflation factor of 2% annual increase in construction costs were applied to each year. The annual cost

figures were then discounted using a factor of 10% to arrive at a total net present value (NPV). The NPV is the total present value of an investment's future cash flows. Table N-6 presents how the NPV for each alternative was derived.

Not included in the construction cost figures are improvements that would be required for redevelopment of the installation but which are not directly associated with residential or non-residential buildings proposed for reuse or construction. These items could include, but are not limited to, improvements or relocation of the installation roadways, infrastructure re-routes, and improvements (that are not directly associated with construction of a building), demolition, alterations to gates or perimeter fencing, or costs associated with the construction or expansion of the golf course.

Table N-4 Summary of Construction Costs for Alternative 1 and Build-Out (2009 dollars)

	Existing	Full Build-out	Difference	Sq Ft	Cost/ Sq Ft	City Multiplier	Total Cost
Non-Residential (square feet)							
Civic and Cultural	18,585	341,970	323,385		$134	0.87	$37,656,854
Education Facility	90,706	237,278	146,572		$129	0.87	$16,398,990
Industry, Warehouse, and Storage	158,775	3,006,030	2,847,255		$60	0.87	$148,455,867
Office	161,365	2,740,608	2,579,243		$130	0.87	$292,124,165
Retail and Commercial	175,840	911,385	735,545		$84	0.87	$53,691,852
Transportation Facility	514,189	1,956,815	1,442,626		$51	0.87	$63,308,904
Hotel or Motel (Rooms)	250	250	0		$102	0.87	$ -
Non-Residential Sub-Total	**1,119,460**	**9,194,086**	**8,074,626**				**$611,636,632**
Residential (units)							
Single-family, 2 Bedrooms	123	123	0	1,200	$104	1.00	$ -
Single-family, 3 Bedrooms	157	157	0	1,600	$104	1.00	$ -
Single-family, 4 Bedrooms	66	66	0	1,800	$104	1.00	$ -
Single-family, 5 Bedrooms	3	3	0	2,500	$104	1.00	$ -
Townhome/Condo, 2 Bedrooms	40	40	0	1,000	$104	1.00	$ -
Townhome/Condo, 3 Bedrooms	155	155	0	1,650	$104	1.00	$ -
Townhome/Condo, 4 Bedrooms	29	29	0	2,300	$104	1.00	$ -
Townhome/Condo, 5 Bedrooms	0	0	0	N/A	$104	1.00	$ -
Apartment, 1 Bedroom	0	649	649	750	$104	1.00	$50,575,372
Apartment, 2 Bedrooms	80	621	541	850	$104	1.00	$47,765,629
Apartment, 3 Bedrooms	0	541	541	950	$104	1.00	$53,385,115
Apartment, 4 Bedrooms	0	0	0	N/A	$104	1.00	$ -
Senior Housing, 1 Bedroom	0	433	433	860	$115	0.87	$37,200,974
Student Housing	129	129	0	850	$160	0.87	$39,272
Residential Sub-Total	**782**	**2,946**	**2,164**				**$188,966,362**
						Total	**$800,602,995**

Table N-5 Summary of Construction Costs for Alternative 2 and Build-Out (2009 dollars)

	Existing	Full Build-out	Difference	Sq Ft	Cost/ Sq Ft	City Multiplier	Total Cost
Non-Residential (square feet)							
Civic and Cultural	18,585	678,712	660,127		$134	0.87	$76,869,111
Education Facility	90,706	860,114	769,408		$133	0.87	$88,925,839
Industry, Warehouse, and Storage	193,935	3,658,267	3,464,332		$60	0.87	$180,630,268
Office	623,394	3,888,465	3,265,071		$130	0.87	$368,855,094
Retail and Commercial	192,840	1,928,070	1,735,230		$84	0.87	$126,664,883
Transportation Facility	0	0	0		$51	0.87	$ -
Hotel or Motel (Rooms)	250	250	0		$102	0.87	$ -
Non-Residential Sub-Total	**1,119,460**	**11,013,628**	**9,894,168**				**$841,945,195**
Residential (units)							
Single-family, 2 Bedrooms	123	123	0	1200	$104	1.00	$ -
Single-family, 3 Bedrooms	157	676	519	1600	$104	1.00	$86,245,344
Single-family, 4 Bedrooms	66	239	173	1800	$104	1.00	$32,342,004
Single-family, 5 Bedrooms	3	3	0	2,500	$104	1.00	$ -
Townhome/Condo, 2 Bedrooms	40	126	86	1,000	$104	1.00	$8,931,960
Townhome/Condo, 3 Bedrooms	155	241	86	1,650	$104	1.00	$14,737,734
Townhome/Condo, 4 Bedrooms	29	29	0	2,300	$104	1.00	$ -
Townhome/Condo, 5 Bedrooms	0	0	0	N/A	$104	1.00	$ -
Apartment, 1 Bedroom	0	1,949	1,949	750	$104	1.00	$151,853,576
Apartment, 2 Bedrooms	80	1,705	1,625	850	$104	1.00	$143,456,625
Apartment, 3 Bedrooms	0	1,625	1,625	950	$104	1.00	$160,289,886
Apartment, 4 Bedrooms	0	0	0	N/A	$104	1.00	$ -
Senior Housing, 1 Bedroom	0	1,300	1,300	860	$115	0.87	$111,696,677
Student Housing	129	203	74	850	$160	0.87	$8,661,298
Residential Sub-Total	**782**	**8,218**	**7,436**				**$718,215,104**
						Total	**$1,560,160,298**

Table N-6 Construction Costs with Inflation and Discount Factors Applied to Determine Net Present Value (NPV) for Alternative 1 and Alternative 2

Year	Project Year	Alt 1 Construction	Discount Factor	Discount Factor	Alt 2 Construction	Discount Factor	Discount Factor
2011	1	$40,830,753	0.9091	$37,118,866	$79,568,175	0.9091	$72,334,705
2012	2	$41,647,368	0.8264	$34,419,312	$81,159,539	0.8264	$67,073,999
2013	3	$42,480,315	0.7513	$31,916,090	$82,782,729	0.7513	$62,195,890
2014	4	$43,329,921	0.6830	$29,594,919	$84,438,384	0.6830	$57,672,552
2015	5	$44,196,520	0.6209	$27,442,562	$86,127,152	0.6209	$53,478,185
2016	6	$45,080,450	0.5645	$25,446,739	$87,849,695	0.5645	$49,588,862
2017	7	$45,982,059	0.5132	$23,596,067	$89,606,689	0.5132	$45,982,400
2018	8	$46,901,700	0.4665	$21,879,989	$91,398,822	0.4665	$42,638,225
2019	9	$47,839,734	0.4241	$20,288,717	$93,226,799	0.4241	$39,537,263
2020	10	$48,796,529	0.3855	$18,813,174	$95,091,335	0.3855	$36,661,826
2021	11	$49,772,460	0.3505	$17,444,944	$96,993,162	0.3505	$33,995,511
2022	12	$50,767,909	0.3186	$16,176,220	$98,933,025	0.3186	$31,523,111
2023	13	$51,783,267	0.2897	$14,999,768	$100,911,685	0.2897	$29,230,521
2024	14	$52,818,932	0.2633	$13,908,876	$102,929,919	0.2633	$27,104,665
2025	15	$53,875,311	0.2394	$12,897,321	$104,988,517	0.2394	$25,133,416
2026	16	$54,952,817	0.2176	$11,959,334	$107,088,288	0.2176	$23,305,532
2027	17	$56,051,874	0.1978	$11,089,564	$109,230,053	0.1978	$21,610,584
2028	18	$57,172,911	0.1799	$10,283,051	$111,414,655	0.1799	$20,038,905
2029	19	$58,316,369	0.1635	$9,535,192	$113,642,948	0.1635	$18,581,530
2030	20	$59,482,697	0.1486	$8,841,724	$115,915,807	0.1486	$17,230,146
		Alternative 1 NPV		**$397,652,430**	**Alternative 2 NPV**		**$774,917,828**

N-3 Methodology and Assumptions for Employment Projections

The build-out analysis (Appendix C) separated redevelopment of NAS Brunswick into six land use districts: Aviation-Related, Community Mixed Use, Professional Office, Business and Technology Industries, Education, and Residential. Of these six land use districts, all but the Residential Land Use District would be able to support employment opportunities based on the land use types identified within each of these districts. Land use types that could be supported within each land use district include: Civic and Cultural; Education Facility; Hotel or Motels; Industry, Warehouse, and Storage; Office; Retail and Commercial; and Transportation Facility.

The build-out analysis outlines the square footage of building space (or number of hotel or motel rooms) that would be constructed or renovated for use over the 5-, 10, 15-, and 20-year phased build-out period. Employment multipliers were determined for each of the land use types and are presented below, along with the associated reference. For a description of the definitions and assumptions made for specific land use multipliers, see "Assumptions and Definitions for Employment Multipliers."

- **Civic and Cultural Land Use** – Public Assembly Multiplier (U.S. Department of Energy 2002): *1,396 mean square feet per employee*.
- **Education Facility Land Use** – Education Multiplier (U.S. Department of Energy 2002): *969 mean square feet per employee*.
- **Hotel or Motel Land Use** – Hotel/Motel Multiplier (Recht Hausrath & Associates 1981): *0.74 employees per room*.
- **Industry, Warehouse, and Storage Land Use** – Wholesale Trade Multiplier (Nelson 2004): *698.06 gross square feet per employee*.
- **Office Land Use** – Office Park Multiplier (Nelson 2004): *350.44 gross square feet per employee*.
- **Retail and Commercial Land Use** – Community Retail Multiplier (Nelson 2004): *671.05 gross square feet per employee*.

- **Transportation Facility Land Use** – *Assumed 0 employment opportunities* (*hangars for storage, no employees associated with these facilities*).

The multiplier specific to each land use was then applied to the square footages of each land us type within each land use district. All multipliers, with the exception of the Hotel/Motel multiplier, are in units of "square feet per employee." For these multipliers, the square footage related to the specified land use was divided by the multiplier, resulting in a total projected number of employees. The Hotel/Motel Multiplier is in units of "employees per room." Thus, the number of hotel/motel rooms in the land use district was multiplied to obtain a projected number of hotel/motel employees. Tables N-7 and N-8 show the estimated number of employment opportunities for each specified land use district, as well as a total number of employees anticipated upon full build-out of Alternatives 1 and 2, respectively.

Definitions for Employment Land Use Multipliers

The following are definitions for the land use-type categories and multipliers utilized in calculating employment projections for Alternative 1 and Alternative 2.

Civic and Cultural Land Use. A Public Assembly Multiplier was used for Civic and Cultural Land Use. This multiplier was obtained from the U.S. Department of Energy (2002), which defines public assembly land use (specifically buildings) as: "buildings in which people gather for social or recreational activities, whether in private or non-private meeting halls." Sub-categories within the public assembly land use include: social or meeting (community center, lodge, meeting hall, convention center, senior center); recreation (gymnasium, health club, bowling alley, ice rink, field house, indoor racquet sports); entertainment or culture (museum, theater, cinema, sports arena, casino, night club); library; funeral home; student activities center; armory; exhibition hall; broadcasting studio; and transportation terminal.

The multiplier was calculated by counting all buildings in the United States that were currently (year 1999) in use. The U.S. Department of Energy then calculated the total square feet of all the buildings and counted the total number of workers in such buildings. After collecting the data, they calculated the mean square foot per building and mean number of workers per square foot. This number for public assembly (Civic and Cultural Land Use) was 1,396 mean square feet/employee. It is to be noted that this multiplier may be higher than other surveyed multipliers due to the fact that it includes all building in use, including those in urban, rural, and exurban areas. Land uses in exurban and rural areas tends to be more land extensive (usually with more space per worker) than in urban areas; therefore, the overall averages may be shifted higher (Nelson 2004).

To project employment opportunities under Alternative 1 and Alternative 2, the number of square feet of civic and cultural land use within each Land Use District was divided by the civic and cultural land use multiplier (phased out in 5-year increments). For example, in the Community and Mixed Use Land Use District, 10 years from the disposal of the installation (under Alternative 1) there are 68,574 square feet proposed of Civic and Cultural Land Use. This number divided by the

Table N-7 Alternative 1 – Projected Employment

Land Use District	5 Years	10 Years	15 Years	20 Years	Multiplier	5 Years	10 Years	15 Years	20 Years
Aviation Related (AR)									
Civic and Cultural[1,a]	0	0	0	0	1,396	0	0	0	0
Education Facility[1,b]	0	0	0	0	969	0	0	0	0
Hotel or Motel (Units)[1,c]	0	0	0	0	0.74	0	0	0	0
Industry, Warehouse, and Storage[3,d]	36,784	164,455	626,095	1,203,145	698.06	53	236	897	1,724
Office[3,e]	0	15,082	75,410	150,820	350.44	0	43	215	430
Retail and Commercial[3,f]	0	0	0	0	671.05	0	0	0	0
Transportation Facility[g]	385,642	658,452	1,235,502	1,956,815	0	0	0	0	0
Total Non-Residential Sq Ft	**422,426**	**837,989**	**1,937,007**	**3,310,780**	**Sub-total Jobs**	**53**	**279**	**1,112**	**2,154**
Community Mixed Use (CMU)									
Civic and Cultural[a]	28,791	68,574	123,539	233,468	1,396	21	49	88	167
Education Facility[1,b]	20,393	48,114	84,757	158,043	969	21	50	87	163
Hotel or Motel (Units)[1,c]	125	250	250	250	0.74	93	185	185	185
Industry, Warehouse, and Storage[3,d]	0	0	0	0	698.06	0	0	0	0
Office [3,e]	120,703	276,169	449,979	797,601	350.44	344	788	1,284	2,276
Retail and Commercial [3,f]	133,708	293,065	421,315	677,816	671.05	199	437	628	1,010
Transportation Facility [g]	0	0	0	0	0	0	0	0	0
Total Non-Residential Sq Ft	**303,594**	**685,922**	**1,079,590**	**1,866,927**	**Sub-total Jobs**	**678**	**1,509**	**2,273**	**3,801**
Professional Office (PO)									
Civic and Cultural[1,a]	0	25,882	51,764	103,527	1,396	0	19	37	74
Education Facility[1,b]	0	0	0	0	969	0	0	0	0
Hotel or Motel (Units)[1,c]	0	0	0	0	0.74	0	0	0	0
Industry, Warehouse, and Storage[3,d]	0	0	0	0	698.06	0	0	0	0
Office[3,e]	0	315,287	630,575	1,261,149	350.44	0	900	1,799	3,599
Retail and Commercial[3,f]	0	31,818	63,636	127,272	671.05	0	47	95	190
Transportation Facility[g]	0	0	0	0	0	0	0	0	0
Total Non-Residential Sq Ft	**0**	**372,987**	**745,974**	**1,491,948**	**Sub-total Jobs**	**0**	**966**	**1,931**	**3,863**

Table N-7 Alternative 1 – Projected Employment

Land Use District	5 Years	10 Years	15 Years	20 Years	Multiplier	5 Years	10 Years	15 Years	20 Years
Business and Technology Industries (B&TI)									
Civic and Cultural[1,a]	2,488	4,975	4,975	4,975	1,396	2	4	4	4
Education Facility[1,b]	0	0	0	0	969	0	0	0	0
Hotel or Motel (Units)[1,c]	0	0	0	0	0.74	0	0	0	0
Industry, Warehouse, and Storage[3,d]	224,180	533,019	956,307	1,802,884	698.06	321	764	1,370	2,583
Office[3,e]	64,207	152,015	270,022	506,038	350.44	183	434	771	1,444
Retail and Commercial[3,f]	15,040	34,843	58,661	106,297	671.05	22	52	87	158
Transportation Facility[g]	0	0	0	0	0	0	0	0	0
Total Non-Residential Sq Ft	**305,914**	**724,851**	**1,289,966**	**2,420,195**	**Sub-total Jobs**	**529**	**1,253**	**2,231**	**4,189**
Education									
Civic and Cultural[1,a]	0	0	0	0	1,396	0	0	0	0
Education Facility[1,b]	39,618	79,235	79,235	79,235	969	41	82	82	82
Hotel or Motel (Units)[1,c]	0	0	0	0	0.74	0	0	0	0
Industry, Warehouse, and Storage[3,d]	0	0	0	0	698.06	0	0	0	0
Office[3,e]	12,500	25,000	25,000	25,000	350.44	36	71	71	71
Retail and Commercial[3,f]	0	0	0	0	671.05	0	0	0	0
Transportation Facility[g]	0	0	0		0	0	0	0	0
Total Non-Residential Sq Ft	**52,118**	**104,235**	**104,235**	**104,235**	**Sub-total Jobs**	**77**	**153**	**153**	**153**
					Grand Total	**1,336**	**4,159**	**7,701**	**14,160**

Multipliers from:

[1] U.S. Department of Energy 2002

[2] Recht Hausrath & Associates 1981

[3] Nelson 2004

Notes:

[a] Units = mean square feet per employee. Public Assembly Multiplier used for Civic and Cultural Land Use (see assumptions and definitions of employment multipliers).

[b] Units = mean square feet per employee. Education Multiplier used for Education Facility Land Use (see assumptions and definitions of employment multipliers).

[c] Units = employees per unit. Hotel/Motel Multiplier used for Hotel or Motel (Units) Land Use (see assumptions and definitions for employment multipliers).

[d] Units = gross square feet per employee: Wholesale Trade Multiplier used for Industry, Warehouse, and Storage Land Use (see assumptions and definitions of employment multipliers).

[e] Units = gross square feet per employee. Office Park Multiplier used for Office Land Use (see assumptions and definitions of employment multipliers).

[f] Units = gross square feet per employee. Community Retail Multiplier used for Retail and Commercial Land Use (see assumptions and definitions for employment multipliers).

[g] Transportation Facility Land Use was assumed to have a multiplier of 0 (see assumptions and definitions for employment multipliers).

Table N-8 Alternative 2 – Projected Employment

Land Use District	5 Years	10 Years	15 Years	20 Years	Multiplier	5 Years	10 Years	15 Years	20 Years
Aviation Related (AR)									
Civic and Cultural[1,a]	0	0	0	0	1,396	0	0	0	0
Education Facility[1,b]	0	0	0	0	969	0	0	0	0
Hotel or Motel (Units)[1,c]	0	0	0	0	0.74	0	0	0	0
Industry, Warehouse, and Storage[3,d]	0	0	0	0	698.06	0	0	0	0
Office[3,e]	0	0	0	0	350.44	0	0	0	0
Retail and Commercial[3,f]	0	0	0	0	671.05	0	0	0	0
Transportation Facility[g]	0	0	0	0	0	0	0	0	0
Total Non-Residential Sq Ft	0	0	0	0	**Sub-total Jobs**	**0**	**0**	**0**	**0**
Community Mixed Use (CMU)									
Civic and Cultural[1,a]	75,305	183,617	348,648	678,712	1,396	54	132	250	486
Education Facility[1,b]	49,744	121,492	231,513	451,555	969	51	125	239	466
Hotel or Motel (Units)[1,c]	125	250	250	250	0.74	93	185	185	185
Industry, Warehouse, and Storage[3,d]	0	0	0	0	698.06	0	0	0	0
Office[3,e]	502,945	1,110,264	1,632,134	2,675,874	350.44	1,435	3,168	4,657	7,636
Retail and Commercial[3,f]	250,450	577,914	962,988	1,733,136	671.05	373	861	1,435	2,583
Transportation Facility[g]	0	0	0	0	0	0	0	0	0
Total Non-Residential Sq Ft	**878,444**	**1,993,287**	**3,175,283**	**5,539,277**	**Sub-total Jobs**	**2,006**	**4,471**	**6,766**	**11,356**
Professional Office (PO)									
Civic and Cultural[1,a]	0	0	0	0	1,396	0	0	0	0
Education Facility[1,b]	0	0	0	0	969	0	0	0	0
Hotel or Motel (Units)[1,c]	0	0	0	0	0.74	0	0	0	0
Industry, Warehouse, and Storage[3,d]	0	0	0	0	698.06	0	0	0	0
Office[3,e]	0	0	0	0	350.44	0	0	0	0
Retail and Commercial[3,f]	0	0	0	0	671.05	0	0	0	0
Transportation Facility[g]	0	0	0	0	0	0	0	0	0
Total Non-Residential Sq Ft	0	0	0	0	**Sub-total Jobs**	**0**	**0**	**0**	**0**

Table N-8 Alternative 2 – Projected Employment

Land Use District	5 Years	10 Years	15 Years	20 Years	Multiplier	5 Years	10 Years	15 Years	20 Years
Business and Technology Industries (B&TI)									
Civic and Cultural[1,a]	0	0	0	0	1,396	0	0	0	0
Education Facility[1,b]	0	0	0	0	969	0	0	0	0
Hotel or Motel (Units)[1,c]	0	0	0	0	0.74	0	0	0	0
Industry, Warehouse, and Storage[3,d]	443,401	1,060,018	1,926,101	3,658,267	698.06	635	1,519	2,759	5,241
Office[3,e]	101,581	251,453	492,907	975,814	350.44	290	718	1,407	2,785
Retail and Commercial[3,f]	19,493	48,734	97,467	194,935	671.05	29	73	145	290
Transportation Facility[g]	0	0	0	0	0	0	0	0	0
Total Non-Residential Sq Ft	**564,476**	**1,360,205**	**2,516,475**	**4,829,016**	**Sub-total Jobs**	**954**	**2,309**	**4,311**	**8,316**
Education									
Civic and Cultural[1,a]	0	0	0	0	1,396	0	0	0	0
Education Facility[1,b]	72,550	161,566	243,897	408,558	969	75	167	252	422
Hotel or Motel (Units)[1,c]	0	0	0	0	0.74	0	0	0	0
Industry, Warehouse, and Storage[3,d]	0	0	0	0	698.06	0	0	0	0
Office[3,e]	33,678	77,944	130,889	236,777	350.44	96	222	373	676
Retail and Commercial[3,f]	0	0	0	0	671.05	0	0	0	0
Transportation Facility[g]	0	0	0	0	0	0	0	0	0
Total Non-Residential Sq Ft	**106,228**	**239,510**	**374,785**	**645,336**	**Sub-total Jobs**	**171**	**389**	**625**	**1,097**
					Grand Total	**3,131**	**7,169**	**11,702**	**20,769**

Multipliers from:

[1] U.S. Department of Energy 2002

[2] Recht Hausrath & Associates 1981

[3] Nelson 2004

Notes:

[a] Units = mean square feet per employee. Public Assembly Multiplier used for Civic and Cultural Land Use (see assumptions and definitions of employment multipliers).

[b] Units = mean square feet per employee. Education Multiplier used for Education Facility Land Use (see assumptions and definitions of employment multipliers).

[c] Units = employees per unit. Hotel/Motel Multiplier used for Hotel or Motel (Units) Land Use (see assumptions and definitions for employment multipliers).

[d] Units = gross square feet per employee. Wholesale Trade Multiplier used for Industry, Warehouse, and Storage Land Use (see assumptions and definitions of employment multipliers).

[e] Units = gross square feet per employee. Office Park Multiplier used for Office Land Use (see assumptions and definitions of employment multipliers).

[f] Units = gross square feet per employee. Community Retail Multiplier used for Retail and Commercial Land Use (see assumptions and definitions for employment multipliers).

[g] Transportation Facility Land Use was assumed to have a multiplier of 0 (see assumptions and definitions for employment multipliers).

1,396 square feet per employee results in a total of 49 employees for this land use type at that phase of build-out. The same methodology was used for all land use categories that were described using square footages. Only Hotels and Motels were projected differently (by units). For a more detailed description of this multiplier, see the section on Hotel and Motel Land Use.

As in the build-out analysis (see Appendix C), square footages through the phased build-out are cumulative, and the same is true for the estimated number of employees. Using the same example as above, after 10 years of redevelopment, it is estimated that there would be 49 jobs in the civic and cultural land use portion of the Community Mixed-Use Land Use District. After 15 years, there would be 88 civic and cultural land use employment opportunities within the Community Mixed-Use Land Use District. This is an additional 39 employment opportunities (88 minus 49) for a total of 88 employment opportunities by 15 years into full build-out. The same cumulative nature applies for all land uses in all land use districts throughout this analysis.

Education Facility Land Use. An Education Multiplier was used for the Education Facility Land Use. This multiplier was obtained from the U.S. Department of Energy (2002), which defines education land use (specifically buildings) as, "buildings used for academic or technical classroom instruction, such as elementary, middle, or high schools, and classroom buildings on college or university campuses. Buildings on education campuses for which the main use is not classroom are included in the category relating to their use. For example, administration buildings are part of 'Office,' dormitories are 'Lodging,' and libraries are 'Public Assembly.'" Sub-categories within the education land use include: elementary or middle school; high school; college or university; preschool or day care; adult education; career or vocational training; and religious education.

The Education Multiplier (Education Facility Land Use) was calculated the same was as Public Assembly (Civic and Cultural Land Use). For a detailed description for how the multiplier was calculated, see Civic and Cultural Land Use. The Education Multiplier (Education Facility Land Use) is 969 mean square feet per employee. As with the Public Assembly Multiplier, it is to be noted that this multiplier may be higher than other surveyed multipliers due to the fact that it includes all building in use, including those in urban, rural, and exurban areas. Land uses in exurban and rural areas tend to be more land extensive (usually with more space per worker) than in urban areas; therefore, the overall averages may be shifted higher (Nelson 2004).

Employment projections for the Education Facility Land Use were calculated the same as for the Civic and Cultural Land Use projections. For a detailed description and examples for employment projections, see Civic and Cultural Land Use.

Hotel or Motel (Units) Land Use. The Hotel/Motel Multiplier was obtained from a survey conducted by Recht Hausrath & Associates (1981). This survey, which was conducted for the City of San Francisco, found that there was an average of 0.74 employees per room (or unit) for hotels and motels. This multiplier may be slightly high, as the City of San Francisco is more densely populated and

larger than the Town of Brunswick; however, no local hotel/motel employee multipliers were available for the State of Maine.

This multiplier was calculated based on the survey results from Recht Hausrath & Associates. In order to project employment opportunities under Alternative 1 and Alternative 2 for this analysis, the number of rooms in each land use district and within each phase was multiplied by 0.74 employees per room to give a total number of employees. For example, within the Community Mixed Use Land Use District (the only district with hotels/motels), 5 years into the phased redevelopment it is projected that there would be 125 hotel/motel units. These 125 units multiplied by the 0.74 employees per unit results in a total of 93 employees. As with all other land uses, the employment opportunities are cumulative. In the same Land Use District, within 10 years it is estimated that there will be 185 employees for the hotel or motel (units) land use. This is an additional 92 employment opportunities (185 minus 93); therefore, ten years after initiating redevelopment, it is estimated that there would be a total of 185 employees associated with the hotel or motel (units) land use within the Community Mixed Use Land Use District.

Industry, Warehouse, and Storage Land Use. A Wholesale Trade Multiplier was assumed to be appropriate for the Industry, Warehouse, and Storage Land Use. The multiplier was obtained from Nelson 2004. The multiplier was calculated by adjusting a local planning assumption called Net Square Foot per employee. This assumption is based primarily on National Association of Industrial and Office Properties (NAIOP) 1990 numbers. Nelson looked at the Net Square Foot per employee and adjusted it by dividing it by (1- the Efficiency Ratio). The efficiency ratio was adapted from the Urban Land Institute's (ULI's) project reference files. This adjusted Net Square Foot per employee was then divided by (1- Vacancy Rate) to give the Gross Square Feet per employee. The vacancy rate was assumed to be 5%.

The employment multiplier utilized for Wholesale Trade (Industry, Warehouse, and Storage Land Use) was 698.06 gross square feet per employee. To calculate the number of employees, the same methodology was used as for Civic and Cultural Land Use. For details on this methodology as well as examples of how the multiplier was applied, see Civic and Cultural Land Use.

Office Land Use. An Office Park Multiplier was assumed to be appropriate for the Office Land Use. The multiplier was obtained from Nelson 2004. Of note, this Office Park Multiplier includes fire, services, and government.

The multiplier for Office Park (Office Land Use) was configured similarly to the Wholesale Trade Multiplier (Industry, Warehouse, and Storage land use). See methodology for the calculation of this multiplier in Industry, Warehouse, and Storage Land Use.

The multiplier utilized for Office Park (Office Land Use) was 350.44 gross square feet per employee. The same methodology was used as under Civic and Cultural Land Use to calculate the number of employees. For details on this methodology

as well as examples of how the multiplier was applied, see Civic and Cultural Land Use.

Retail and Commercial Land Use. A Community Retail Multiplier was assumed to be appropriate for Retail and Commercial Land Use. Community Retail was chosen as a medium between local retail (such as a local, family-owned shop) and a super-regional retail (such as a Wal-Mart). It was assumed that the majority of new development on the installation property would fall somewhere between these two extremes. The multiplier was obtained from Nelson 2004.

The multiplier for Community Retail (Retail and Commercial Land Use) was configured similar to the Wholesale Trade Multiplier (Industry, Warehouse, and Storage Land Use). See methodology for the calculation of this multiplier in Industry, Warehouse, and Storage Land Use.

The Community Retail Multiplier (Retail and Commercial Land Use) was 671.05 gross square feet per employee. The same methodology was used as under Civic and Cultural Land Use to calculate the number of employees. For details on this methodology as well as examples of how the multiplier was applied, see Civic and Cultural Land Use.

Transportation Facility Land Use. Transportation Facility Land Use was assumed to have a multiplier of 0. This is due to the fact that the transportation facility land use is assumed to be for hangers and runway. It is assumed that employment opportunities associated with this land use are captured within the Office and Warehouse, Industry, and Storage Land Uses within the Aviation-Related Land Use District.

N-4 Methodology and Assumptions for Estimating Indirect/Induced Off-Base Impacts

This section describes the assumptions, methodology, and sources utilized in estimating the number of indirect and induced jobs that would potentially be created as a result of the proposed reuse and redevelopment of the NAS Brunswick property under Alternative 1 or Alternative 2. Under the No-Action Alternative, the installation would be maintained in caretaker status, not experience any redevelopment, and therefore would have minimal associated direct and indirect jobs.

The basic formula used to calculate the anticipated off-base indirect and induced impacts resulting from reuse and redevelopment of NAS Brunswick is:

STEP 1 - Indirect and induced jobs calculated from multipliers
STEP 2 - Number of indirect and induced jobs included in on-base redevelopment
STEP 3 - Number of indirect and induced jobs associated with the former installation

RESULTS = Net Number of Indirect and Induced Off-base Jobs

The assumptions and methodology will be outlined using Alternative 1; however, the same process would be applied to Alternative 2.

Alternative 1

The following outlines the detailed steps for calculating the indirect and induced off-base impacts associated with Alternative 1.

Step 1

- RIMS II multipliers were obtained for the counties that are represented in the Brunswick Labor Market Area (LMA), namely, Cumberland County, Sagadahoc County, and Lincoln County. Economic multipliers were unavailable for the Brunswick LMA or geographic areas smaller than the county level. Thus, for this analysis, the presence of the city of Portland, Maine, in the multiplier obtained for Cumberland County may artificially increase the multiplier to a level higher than what the town of Brunswick and the Brunswick LMA would experience. This results in a rather conservative estimate of indirect employment impacts.

- RIMS II multipliers were used to calculate the number of indirect jobs resulting from the creation of industry, warehousing and storage, and office jobs on the installation property. (Note: Indirect jobs for industries such as civic and

cultural, hotel and motel, and retail and commercial were considered part of the on-base indirect impacts already represented in the conservative direct job estimation, which will be described under Step 2.)

Table N-9 shows the number of indirect jobs that would be generated by increased employment in these two industries after 5 years, 10 years, 15 years, and 20 years as part of the phased build-out analysis. **A total of 6,057 indirect jobs would be generated under Alternative 1 after full build-out.**

Table N-9 Indirect Jobs Generated by Industry, Warehouse and Storage, and Office Industries on the Former NAS Brunswick Property under Alternative 1

		5 years	10 years	15 years	20 years
Industry, Warehouse and Storage (using Warehousing and Storage multiplier)	**Direct**	374	1,000	2,267	**4,307**
	RIMS II Multiplier	*1.6512*	*1.6512*	*1.6512*	*1.6512*
	Direct + Indirect	618	1,651	3,743	**7,112**
	Indirect only	244	651	1,476	**2,805**
Office (using Administrative and Support Services multiplier)	**Direct**	563	2,236	4,140	**7,820**
	RIMS II Multiplier	*1.4159*	*1.4159*	*1.4159*	*1.4159*
	Direct + Indirect	*797*	*3,166*	*5,862*	***11,072***
	Indirect	234	930	1,722	**3,252**
Total	**Direct**	**937**	**3,236**	**6,407**	**12,127**
	Indirect	**478**	**1,581**	**3,198**	**6,057**

Step 2

- Implementation of Alternative 1 would create jobs in other industries, including civic and cultural, educational services, hotels, and retail or commercial space. These jobs, totaling 936 after 20 years, are assumed to be indirect jobs which, to some extent, would support jobs in the industry, warehouse and storage, and office sectors. Because these supporting jobs would be present on the former installation property, they would reduce some of the additional supporting jobs that would be expected in the surrounding (off-installation) community.

- One of the guiding principles included in the Reuse Master Plan developed by the Brunswick Local Redevelopment Authority (BLRA) was to "consider 'smart growth' strategies that promote sustainable development and balance economic development, environmental protection, and the preservation or enhancement of the equality of life for Brunswick residents" (BLRA 2007a). (For the full text of the guiding principles, see Section 2.1.1, Reuse Master Plan Goals and Objectives.) The smart growth ideal is development that is more town-centered, transit and pedestrian oriented, and has a greater mix of housing, commercial, and retail uses in proximity to one another. The reuse

districts on NAS Brunswick include smart growth principles in that they would incorporate industries and jobs (e.g., performing arts, museums, and related activities; educational services; accommodation; and retail trade) that would provide on-site community support for the industrial and professional industries.

Creation of 936 indirect jobs on the installation property would reduce the indirect supporting jobs created in the surrounding community to 5,121 jobs.

Step 3

- The report "Understanding the Impact: Closing Naval Air Station Brunswick," prepared by the Maine State Planning Office in 2007 (Renski and Reilly January 2007) estimates that closure of NAS Brunswick would result in 2,800 to 3,300 fewer jobs in the surrounding community. According to the report, these figures mainly reflect slower job growth, with some job losses as working military spouses relocate out of the area or some workers are laid off.

  Using the median point of this range, it is estimated that there would be an indirect job loss of 3,050 off-base jobs associated with the closure of the installation. However, with redevelopment of the installation as proposed under Alternatives 1 and 2, many of the jobs would be replaced by the new off-base jobs resulting from the redevelopment.

- Other studies have been completed that quantified indirect impacts from the operation of NAS Brunswick. The 2005 BRAC estimate for closure of NAS Brunswick was an approximate loss of 3,808 in the Portland-South Portland-Biddeford MSA. The estimated impact used in this analysis is between these two estimates, and since the multiplier used for the calculation of indirect employment (under Step 1) was essentially for the Portland-South Portland-Biddeford MSA, using a slightly higher range of indirect jobs is warranted.

  The 3,050 indirect, off-base jobs associated with the former installation would move towards supporting the new development, and reduce the number of new indirect off-base jobs to 2,071 jobs.

Results

The result of the calculations outlined in these steps is a total indirect off-base employment increase of 2,071 jobs. This would be phased in over the 20-year redevelopment period (see Table N-10).

Table N-10 Summary of Steps and Total Indirect/Induced Off-Base Employment Impacts Under Alternative 1

	5 years	10 years	15 years	20 years
Step 1	478	1,581	3,198	6,057
Step 2	-187	-431	-599	-936
Step 3	-3,050	-3,050	-3,050	-3,050
Total Indirect, Off-base Jobs	**-2,759**	**-1,900**	**149**	**2,071**

Applying the Results to the FEIS – Alternative 1

The indirect off-base employment impacts for Alternatives 1 and 2 are presented in subsections 4.2.1.3 and 4.2.2.3 (Employment) of the FEIS, respectively. An additional discussion is presented in subsections 4.2.1.2 and 4.2.2.2 (Income), as changes in indirect off-base employment will have a proportional change to the personal income earned by individuals in and around the former installation.

However, as will be outlined below, it is not anticipated that this indirect off-base change in employment will result in a measurable change the study area's (Brunswick LMA) population. Furthermore, since projected population change due to the proposed action is the major driver in determining impacts for multiple resource areas in the EIS, the impacts on these resource areas were captured through the population change resulting from the build-out of residential units. This methodology applies to the following resources: housing; educational facilities; healthcare/medical facilities; public safety and emergency services; parks and recreation services; water supply; wastewater supply; and other utility systems. Thus, the indirect off-base employment changes will not change the results as measured in the DEIS.

The change in the number jobs (combining both direct and indirect) does warrant inclusion in the transportation analysis. Regardless of whether the individual lives within or outside of the Brunswick LMA, their commute to work would result in a vehicle trip within the Brunswick LMA. Thus, the transportation resource area would be updated to incorporate these indirect off-base employment changes. These changes are applied based upon the number of jobs created off-base during each five-year phased build-out period. The number of jobs is directly related to the number of vehicle trips to and from the job. These numbers were applied to the transportation analysis by calculating the percentage of the indirect off-base jobs as compared to the number of jobs existing in the Brunswick LMA. The number of jobs in the Brunswick LMA was obtained from the Maine Department of Labor, Division of Labor Market Information Services, which estimated that in 2006 there were 29,465 jobs within the Brunswick LMA. Thus, an increase of 2,071 jobs would be an increase of approximately 7% of the "background" vehicle trips within the Brunswick LMA. This change, combined with the direct transportation impacts associated with the build-out on the former installation property, provides the total impact on the transportation network.

With the revisions incorporated into the transportation analysis related to indirect employment impacts, the air quality analysis also required revisions. The change in air quality impacts, which were incorporated into Section 4.6 of the FEIS, are not significant enough to change in the findings and conclusions originally presented in the DEIS.

Assumptions for Population Change

The following three factors combine to establish that the potential change in population resulting from indirect off-base employment impacts would be minimal: (1) 33% of the individuals who work in the Brunswick LMA live outside of the area, (2) the population of the Brunswick LMA is projected to grow over the

next 20 years at a rate that would outpace the potential effects of this action, and (3) the recent growth in the civilian labor force and higher unemployment in the past two years would serve to absorb many of the jobs that would be created as part of this action. These factors are discussed in more detail below.

- Multiple sources (State of Maine Planning Office and Maine Department of Labor) estimate that approximately 33% of the individuals that work within the town of Brunswick live outside the Brunswick Labor Market Area (LMA) and commute to the area for their job. Thus, the same assumption can be applied to the number of indirect off-base jobs noted in the "RESULTS" section. At full-build out (20 years), with an estimated 2,071 indirect off-base jobs created, it can be calculated that 67%, or 1,388 of these employees, would reside within the Brunswick LMA. For the State of Maine, there is an average of 2.4 persons per household, and the 1,388 employees are assumed to be associated with 3,331 family members or dependents.

- It is also estimated that the 2030 population of Brunswick LMA will reach 76,334 (Maine State Planning Office), which represents an increase of approximately 4,185 (5.8%). It is expected that the increase of 3,331 people in the Brunswick LMA would be absorbed into anticipated natural growth of the local community by 2030.

- The EIS presents the 2007 civilian labor force in the Brunswick LMA at 36,643 and the number of unemployed at 1,711. These numbers are from the US Census Bureau, which was used as a standard source throughout the socioeconomic analysis for the baseline year (2008). This data from the US Census Bureau represents a 3-year average of these statistics for Brunswick LMA. More recent data available from the Maine Department of Labor estimates that the Brunswick LMA civilian labor force in July 2010 was 35,473, with the number of unemployed at 2,503 (Maine Department of Labor 2010).

  It is assumed that the indirect off-base jobs created would be accommodated primarily through the local unemployed labor force, although some of the jobs would be either specialized or could not be filled by the local labor pool. Jobs not filled by the local unemployed labor force would most likely be filled by workers commuting from outside the Brunswick LMA or workers who move to the area specifically to fill such positions.

As of 2007, there were 5,987 vacant housing units in Brunswick LMA, and the redevelopment of the former installation proposes another 2,946 housing units (under Alternative 1), which would be adequate to accommodate the number of individuals projected to move to the area for employment.

If any additional commercial or residential development is required to support the indirect off-base employment or housing needs (beyond the utilization of existing commercial and residential structures), the Town of Brunswick has identified areas for potential development in the Zoning Ordinance, Comprehensive Plan, and Gateway 1 Corridor Plan. These planning growth areas include the BNAS Reuse District, the Commercial Connector, the Cooks Corner Commercial Hub, the

Town Core Area, the Town Residential Area, and the Town Extended Residential Area. These areas are identified on Figure 3.1-3 in the FEIS.

Alternative 2

The steps for Alternative 2 are identical to those described under Alternative 1. Table N-11 presents the calculations along with the results of the analysis for Alternative 2.

Table N-11 Indirect Jobs Generated by Industry, Warehouse and Storage, and Office Industries on the Former NAS Brunswick Property under Alternative 2

		5 years	10 years	15 years	20 years
Industry, Warehouse and Storage (using Warehousing and Storage multiplier)	**Direct**	635	1,519	2,759	**5,241**
	RIMS II Multiplier	*1.6512*	*1.6512*	*1.6512*	*1.6512*
	Direct + Indirect	1,049	2,508	4,556	**8,654**
	Indirect only	414	989	1,797	**3,413**
Office (using Administrative and Support Services multiplier)	**Direct**	1,821	4,108	6,437	**11,096**
	RIMS II Multiplier	*1.4159*	*1.4159*	*1.4159*	*1.4159*
	Direct + Indirect	*2,578*	*5,817*	*9,114*	***15,712***
	Indirect	757	1,709	2,677	**4,615**
Total	**Direct**	**2,456**	**5,627**	**9,197**	**16,337**
	Indirect	**1,171**	**2,697**	**4,474**	**8,027**

Results

The result of the calculations outlined in these steps is a total indirect off-base employment increase of 2,934 jobs. This would be phased in over the 20-year period redevelopment (see Table N-12).

Table N-12 Summary of Steps and Total Indirect/Induced Off-Base Employment Impacts Under Alternative 2

	5 years	10 years	15 years	20 years
Step 1	1,171	2,697	4,474	8,027
Step 2	-314	-716	-1,158	-2,043
Step 3	-3,050	-3,050	-3,050	-3,050
Total Indirect, Off-base Jobs	**-2,193**	**-1,069**	**266**	**2,934**

Applying the Results to the FEIS – Alternative 2

The resource areas that would change based upon the inclusion of indirect off-base jobs are the same as those described under Alternative 1. The same assumptions would apply, namely, that the overall population of the Brunswick LMA would not change significantly due to these indirect impacts. Thus, housing, community services, and infrastructure resources would not be affected.

Using the same logic as described under Alternative 1, the transportation resource area would be affected due to the additional vehicle trips by employees traveling to these new off-base jobs. This analysis is applied to the FEIS in the same fashion as under Alternative 1.

N-5 Methodology and Assumptions for Water Supply and Wastewater Projections

The assumptions used in determining the land use-specific multipliers for water and wastewater projections were obtained from Nelson 2004. Nelson adapted these multipliers from *Environmental Health Planning Guide and Environmental Health Practice in Recreational Areas* (U.S. Public Health Service n.d.a, n.d.b), and it is noted in the text book that "No warranty is made that the figures reported... reflect the consumption characteristics of any given local government" (Nelson 2004, pp. 105 and 106).

Civic and Cultural Land Use

Civic and Cultural Land Use was assumed to be similar to Office Land Use in terms of water consumption and wastewater generation. It was assumed that average water usage and wastewater generation would be similar to that of an office building. When an event is held at a civic or cultural center, there is an increase in the consumption of water and the generation of wastewater. However, it is assumed that, on average, water consumption would be similar to that of an office land use. Office water consumption and wastewater generation is generally more constant than the intermittent high/low demands at a cultural and civic center, but looking on average across a long period of time, it is assumed the two different land uses would use similar amounts of water and generate similar amounts of wastewater.

The multiplier for the Civic and Cultural Land Use water consumption and wastewater generation is in average gallons per day (gpd) per 1,000 square feet of space. It was assumed that this would be 125 gpd per 1,000 square feet (or 0.125 gpd per square foot) for water consumption, and 119 gpd per 1,000 square feet (or 0.119 gpd per square foot) for wastewater generation.

To project water consumption and wastewater generation under Alternative 1 and Alternative 2, the Civic and Cultural Land Use multiplier was multiplied by the number of square feet of Civic and Cultural Land Use within each specified Land Use District (phased out in 5 year increments), as described in the build-out analysis (see Appendix C). In the build-out analysis, square footages through the phased build-out are cumulative. The same is true for estimated water consumption and wastewater generation.

Example: Use of Water Consumption Multiplier for Civic and Cultural Land Use*. Under Alternative 1, in the Community Mixed-Use Land Use District, 5 years after initiating redevelopment, it is expected that 28,791 square feet of Civic and Cultural Land Use will be available. Applying the Civic and Cultural Land Use Water Consumption multiplier (0.125 gpd per square foot) to the number of square feet projected (28,791 square feet) gives an estimate of the amount of water consumed by Civic and Cultural Land Use in the Community Mixed-Use Land Use District after 5 years of redevelopment under Alternative 1.

28,791 square feet x 0.125 gpd per square feet = 3,598.875 gpd of water**

All final numbers were rounded to the nearest whole number, resulting in a total projected water consumption for the above scenario of 3,599gpd**.

* The same methodology was used to project wastewater generation; substitute in 0.119 gpd per square foot for the multiplier.

** Note: Numbers may not match directly with table due to rounding in the build-out analysis for number of square feet of non-residential space.

Education Facility Land Use

Education Facility Land Use was assumed to be similar to the Office Land Use in terms of water consumption and wastewater generation. It was assumed that average water usage and wastewater generation would be comparable to that of an office building. In an education facility there could be classes, events, or faculty offices. When classes or an event are held at a facility, there is an increase in the consumption of water and the generation of wastewater. However, it is assumed that, on average, the water consumption would be more similar to an office land use. Office water consumption and wastewater generation are generally more constant than the intermittent high/low demands in an educational classroom space or event center, but looking on average across a long period of time, it is assumed the two different land uses would use similar amounts of water and generate similar amounts of wastewater.

The multiplier for the Education Facility Land Use water consumption and wastewater generation is in average gallons per day (gpd) per 1,000 square feet of space. It was assumed that this would be 125 gpd per 1,000 square feet (or 0.125 gpd per square foot) for water consumption, and 119 gpd per 1,000 square feet (or 0.119 gpd per square foot) for wastewater generation.

To project water consumption and wastewater generation under Alternative 1 and Alternative 2, the Education Facility Land Use multiplier was multiplied by the number of square feet of Education Facility Land Use within each specified Land Use District (phased out in 5-year increments), as described in the build-out analysis (see Appendix C). In the build-out analysis, square footages through the phased build-out are cumulative. The same is true for estimated water consumption and wastewater generation.

Example: Use of Water Consumption Multiplier for Education Facility Land Use*. Under Alternative 1, in the Community Mixed Use Land Use District, 5 years after initiating redevelopment, it is expected that there will be 20,393square feet of Education Facility Land Use. Applying the Education Facility Land Use Water Consumption multiplier (0.125 gpd per square foot) to the projected number of square feet (20,393 square feet) gives an estimate of the amount of water consumed for Education Facility Land Use in the Community Mixed-Use Land Use District after 5 years of redevelopment under Alternative 1.

20,393 square feet X 0.125 gpd per square feet = 2,549.125 gpd of water**

All final numbers were rounded to the nearest whole number, resulting in a total projected water consumption for the above scenario of **2,549** gpd.**

* The same methodology was used to project wastewater generation; substitute in 0.119 gpd per square foot for the multiplier.

** Note: Numbers may not match directly with table due to rounding in the build-out analysis for number of square feet of non-residential space.

Hotel or Motel (Units) Land Use

The Hotel/Motel Multiplier assumes that each Hotel/Motel will have a restaurant. This is a conservative assumption. The Hotel/Motel multiplier is 125 gpd per unit.

To project water consumption and wastewater generation under Alternative 1 and Alternative 2, the Hotel/Motel (Unit) Land Use multiplier was multiplied by the number of units of hotels/motels within each specified Land Use District (phased out in 5 year increments), as described in the build-out analysis (see Appendix C). In the build-out analysis, the number of units through the phased build-out is cumulative. The same is true for estimated water consumption and wastewater generation.

Example: Use of Water Consumption Multiplier for Hotel/Motel (Units) Land Use*. Under Alternative 1, in the Community Mixed-Use Land Use District, 5 years after initiating redevelopment, it is expected that there will be 125 hotel/motel units. Applying the Hotel/Motel Water Consumption multiplier (125 gpd per unit) to the number of units projected (125 units) gives an estimate of the amount of water consumed for Hotel/Motel (Units) Land Use after 5 years of redevelopment under Alternative 1.

125 units x 125 gpd per unit = 15,625 gpd of water**

All final numbers were rounded to the nearest whole number, resulting in a total projected water consumption for the above scenario of **15,625** gpd.**

* The same methodology was used to project wastewater generation; substitute in 0.119 gpd per square foot for the multiplier.

** Note: Numbers may not match directly with table due to rounding in the build-out analysis for number of hotel/motel units.

Industry, Warehouse, and Storage Land Use

A Light Industrial water consumption and wastewater generation multiplier was assumed to be appropriate for the Industry, Warehouse, and Storage Land Use. The light industrial multiplier had the units of gpd per employee. As such, employment projections were used to project water consumption and wastewater generation for the Industry, Warehouse, and Storage Land Use.

The multipliers used for Industry, Warehouse, and Storage Land Use were 25 gpd per employee for water consumption and 24 gpd per employee for wastewater generation. To project water consumption and wastewater generation under Alternative 1 and Alternative 2, the number of projected employees within each specified Land Use District (see Section N-3 for a description of employment projections), phased out in 5-year increments as described in the build-out analysis (see Appendix C), was multiplied by the Industry, Warehouse, and Storage Land Use multiplier. In both the build-out analysis and employment projections, square footages through the phased build-out are cumulative. The same is true for estimated water consumption and wastewater generation.

Example: Use of Water Consumption Multiplier for Industry, Warehouse, and Storage Land Use*. Under Alternative 1, in the Aviation-Related Land Use District, 5 years after initiating redevelopment, it is expected that there will be 53 employees in the Industry, Warehouse, and Storage Land Use. Applying the Industry, Warehouse, and Storage Employee multiplier (25 gpd per employee) to the number of employees projected (53 employees) gives an estimate of the amount of water consumed for Industry, Warehouse, and Storage Land Use in the Aviation Related District after 5 years of redevelopment under Alternative 1.

53 units x 25 gpd per unit = 1,325 gpd of water**

All final numbers were rounded to the nearest whole number, resulting in a total projected water consumption for the above scenario of **1,325** gpd.**

* The same methodology was used to project wastewater generation; substitute in 0.119 gpd per square foot for the multiplier.

** Note: Numbers may not match directly with table due to rounding in the build-out analysis for number of hotel/motel units.

Office Land Use

Office Land Use projections for water consumption and wastewater generation were estimated using an office multiplier. The multiplier for Office Land Use water consumption and wastewater generation is average gallons per day (gpd) per 1,000 square feet of space. It was assumed that this would be 125 gpd per 1,000 square feet (or 0.125 gpd per square foot) for water consumption, and 119 gpd per 1,000 square feet (or 0.119 gpd per square foot) for wastewater generation.

To project water consumption and wastewater generation under Alternative 1 and Alternative 2, the Office Land Use multiplier was multiplied by the number of square feet of Office Land Use within each specified Land Use District (phased out in 5-year increments), as described in the build-out analysis (see Appendix C). In the build-out analysis, square footages through the phased build-out are cumu-

lative. The same is true for estimated water consumption and wastewater generation.

Example: Use of Water Consumption Multiplier for Office Land Use*. Under Alternative 1, in the Community Mixed-Use Land Use District, 5 years after initiating redevelopment, it is expected that there will be 120,703 square feet of Office Land Use. Applying the Office Land Use Water Consumption multiplier (0.125 gpd per square foot) to the number of square feet projected (120,703 square feet) gives an estimate of the amount of water consumed for Office Land Use in the Community Mixed-Use District after 5 years of redevelopment under Alternative 1.

120,703 square feet x 0.125 gpd per square feet = 15,087.875 gpd of water**

All final numbers were rounded to the nearest whole number, resulting in a total projected water consumption for the above scenario of **15,088** gpd.**

* The same methodology was used to project wastewater generation; substitute in 0.119 gpd per square foot for the multiplier.

** Note: Numbers may not match directly with table due to rounding in the build-out analysis for number of square feet of non-residential space.

Retail and Commercial Land Use

Retail and Commercial Land Use projections for water consumption and wastewater generation were estimated using a shopping center multiplier. The multiplier for Retail and Commercial Land Use water consumption and wastewater generation is in average gallons per day (gpd) per 1,000 square feet of space. It was assumed that this would be 125 gpd per 1,000 square feet (or 0.125 gpd per square foot) for water consumption, and 119 gpd per 1,000 square feet (or 0.119 gpd per square foot) for wastewater generation.

To project water consumption and wastewater generation under Alternative 1 and Alternative 2, the Retail and Commercial Land Use multiplier was multiplied by the number of square feet of Education Facility Land Use within each specified Land Use District (phased out in 5-year increments), as described in the build-out analysis (see Appendix C). In the build-out analysis, square footages through the phased build-out are cumulative. The same is true for estimated water consumption and wastewater generation.

Example: Use of Water Consumption Multiplier for Office Land Use*. Under Alternative 1, in the Community Mixed-Use Land Use District, 5 years after initiating redevelopment, it is expected that there will be 133,708 square feet of Retail and Commercial Land Use. Applying the Retail and Commercial Land Use Water Consumption multiplier (0.125 gpd per square foot) to the number of square feet projected (133,708 square feet) gives an estimated amount of water consumed for Retail and Commercial Land Use in the Community Mixed Use District after 5 years of redevelopment under Alternative 1.

133,708 square feet x 0.125 gpd per square feet = 16,713.5 gpd of water**

All final numbers were rounded to the nearest whole number, resulting in a total projected water consumption for the above scenario of **16,714** gpd.**

* The same methodology was used to project wastewater generation; substitute in 0.119 gpd per square foot for the multiplier.

** Note: Numbers may not match directly with table due to rounding in the build-out analysis for number of square feet of non-residential space.

Transportation Facility Land Use

Transportation Facility Land Use was assumed to have a multiplier of 0. This is due to the fact that the transportation facility land use is assumed to be for hangers and runway. Although there would most likely be water available in such buildings for fire suppression and other emergency services, water is not expected to be used on a regular basis. It is assumed that water consumption and wastewater generation associated with this land use are captured within the Office and Warehouse, Industry, and Storage Land Uses within the Aviation-Related Land Use District.

Residential Units

All residential unit water consumption and wastewater generation multipliers are in gpd per housing unit. The following assumptions and water supply and wastewater multipliers were used for residential units. For all single-family homes, regardless of number of bedrooms, a Residence, Single-Family Multiplier was used. It is assumed that a 5-bedroom home would most likely use more water and create more wastewater than a single-family home with 2 bedrooms. However, the multiplier is assumed to be an average and therefore is applicable to all single-family homes regardless of the number of bedrooms.

Townhomes/condos, student apartments, senior apartments, and apartments were all assumed to have the same multiplier for apartments. The multiplier is split between apartments with less than (<) 3 bedrooms and those with (≥) 3 or more bedrooms. Each apartment (including townhomes/condos, student apartments, senior apartments, and apartments) is evaluated based on the number of bedrooms. Table N-13 shows the residential unit, multiplier name and multipliers for both water consumption and waste water generation in gpd per unit.

To project water consumption and wastewater generation under Alternative 1 and Alternative 2, the specific Residential Unit multiplier was multiplied by the number of residential units within each specified Land Use District (phased out in 5-year increments), as described in the build-out analysis (see Appendix C). In the build-out analysis, the number of units through the phased build-out is cumulative. The same is true for estimated water consumption and wastewater generation

Table N-13 Multipliers for Residential Units

Residential Unit	Multiplier Name	Multiplier (gpd/unit) Water Consumption	Multiplier (gpd/unit) Wastewater Generation
Single-family (2 Bedroom)	Single Family	280	224
Single-family (3 Bedroom)	Single Family	280	224
Single-family (4 Bedroom)	Single Family	280	224
Single-family (5 Bedroom)	Single Family	280	224
Townhome/Condo (1 Bedroom)	Apartment (<3 bedrooms)	180	162
Townhome/Condo (2 Bedroom)	Apartment (<3 bedrooms)	180	162
Townhome/Condo (3 Bedroom)	Apartment (≥3 bedrooms)	280	252
Townhome/Condo (4 Bedroom)	Apartment (≥3 bedrooms)	280	252
Townhome/Condo (5 Bedroom)	Apartment (≥3 bedrooms)	280	252
Apartment (1 Bedroom)	Apartment (<3 bedrooms)	180	162
Apartment (2 Bedroom)	Apartment (<3 bedrooms)	180	162
Apartment (3 Bedroom)	Apartment (≥3 bedrooms)	280	252
Apartment (4 Bedroom)	Apartment (≥3 bedrooms)	280	252
Senior Apartment (1 Bedroom)	Apartment (<3 bedrooms)	180	162
Student Apartment (1 Bedroom)	Apartment (<3 bedrooms)	180	162

Example: Use of Water Consumption Multiplier for Residential Units*. Under Alternative 1, in the Community Mixed-Use Land Use District, 5 years after initiating redevelopment, it is expected that there will be 94 2-bedroom apartments. Applying the 2-bedroom Apartment multiplier (180 gpd per unit) to the number of units projected (94 units) gives an estimate of the amount of water consumed for 2-bedroom apartments in the Community Mixed-Use District after 5 years of redevelopment under Alternative 1.

94 units x 180 gpd per unit = 16,920 gpd of water**

All final numbers were rounded to the nearest whole number, resulting in a total projected water consumption for the above scenario of **16,920** gpd.**

* The same methodology was used to project wastewater generation; substitute in 162 gpd per unit for the multiplier.

** Note: Numbers may not match directly with table due to rounding in the build-out analysis for number of units.

Total Water Consumption and Wastewater Generation. Upon calculating water consumption and wastewater generation by each land use type or residential unit, the subtotals by land use district were summed to achieve a grand total at each phase of development under Alternative 1 and Alternative 2, which are shown in summary in Section 4.8 of this DEIS and shown in detail by Alternative below (see Tables N-14 through N-17).

Table N-14 Water Supply Under Alternative 1

Land Use District	5 Years	10 Years	15 Years	20 Years	Multiplier	5 Years	10 Years	15 Years	20 Years
Aviation Related (AR)									
Civic and Cultural	0	0	0	0	0.125	0	0	0	0
Education Facility	0	0	0	0	0.125	0	0	0	0
Hotel or Motel[1]	0	0	0	0	125.00	0	0	0	0
Industry, Warehouse, and Storage[2]	53	236	897	1,724	25	1,317	5,890	22,423	43,089
Office	0	15,082	75,410	150,820	0.125	0	1,885	9,426	18,852
Retail and Commercial	0	0	0	0	0.125	0	0	0	0
Student Housing[1]	0	0	0	0	180	0	0	0	0
Transportation Facility	385,642	658,452	1,235,502	1,956,815	0	0	0	0	0
Total Non-Residential Sq Ft	**422,426**	**837,989**	**1,937,007**	**3,310,780**	**Subtotal Water**	**1,317**	**7,775**	**31,849**	**61,941**
Community Mixed Use (CMU)									
Civic and Cultural	28,791	68,574	123,539	233,468	0.125	3,599	8,572	15,442	29,183
Education Facility	20,393	48,114	84,757	158,043	0.125	2,549	6,014	10,595	19,755
Hotel or Motel[1]	125	250	250	250	125.00	15,625	31,250	31,250	31,250
Industry, Warehouse, and Storage[2]	0	0	0	0	25	0	0	0	0
Office	120,703	276,169	449,979	797,601	0.125	15,088	34,521	56,247	99,700
Retail and Commercial	133,708	293,065	421,315	677,816	0.125	16,713	36,633	52,664	84,727
Student Housing[1]	0	0	0	0	180	0	0	0	0
Transportation Facility	0	0	0	0	0	0	0	0	0
Apartment - 1 Bedroom	65	162	325	649	180	11,687	29,217	58,435	116,870
Apartment - 2 Bedroom	94	215	351	621	180	16,939	38,748	63,096	111,791
Apartment - 3 Bedroom	54	135	271	541	280	15,150	37,874	75,749	151,498
Apartment - 4 Bedroom	0	0	0	0	280	0	0	0	0
Senior Housing - 1 Bedroom	43	108	216	433	180	7,791	19,478	38,957	77,913
Total Non-Residential Sq Ft	**303,594**	**685,922**	**1,079,590**	**1,866,927**	**Subtotal Water**	**105,141**	**242,308**	**402,435**	**722,688**
Professional Office (PO)									
Civic and Cultural	0	25,882	51,764	103,527	0.125	0	3,235	6,470	12,941
Education Facility	0	0	0	0	0.125	0	0	0	0
Hotel or Motel[1]	0	0	0	0	125.00	0	0	0	0
Industry, Warehouse, and Storage[2]	0	0	0	0	25	0	0	0	0
Office	0	315,287	630,575	1,261,149	0.125	0	39,411	78,822	157,644
Retail and Commercial	0	31,818	63,636	127,272	0.125	0	3,977	7,954	15,909
Student Housing[1]	0	0	0	0	180	0	0	0	0
Transportation Facility	0	0	0	0	0	0	0	0	0
Total Non-Residential Sq Ft	**0**	**372,987**	**745,974**	**1,491,948**	**Subtotal Water**	**0**	**46,623**	**93,247**	**186,494**
Business and Technology Industries (B&TI)									
Civic and Cultural	2,488	4,975	4,975	4,975	0.125	311	622	622	622

Table N-14 Water Supply Under Alternative 1

Land Use District	5 Years	10 Years	15 Years	20 Years	Multiplier	5 Years	10 Years	15 Years	20 Years
Education Facility	0	0	0	0	0.125	0	0	0	0
Hotel or Motel[1]	0	0	0	0	125.00	0	0	0	0
Industry, Warehouse, and Storage[2]	321	764	1,370	2,583	25	8,029	19,089	34,249	64,568
Office	64,207	152,015	270,022	506,038	0.125	8,026	19,002	33,753	63,255
Retail and Commercial	15,040	34,843	58,661	106,297	0.125	1,880	4,355	7,333	13,287
Student Housing[1]	0	0	0	0	180	0	0	0	0
Transportation Facility	0	0	0	0	0	0	0	0	0
Total Non-Residential Sq Ft	**305,914**	**724,851**	**1,289,966**	**2,420,195**	**Subtotal Water**	**18,245**	**43,068**	**75,956**	**141,731**
Education									
Civic and Cultural	0	0	0	0	0.125	0	0	0	0
Education Facility	39,618	79,235	79,235	79,235	0.125	4,952	9,904	9,904	9,904
Hotel or Motel[1]	0	0	0	0	125.00	0	0	0	0
Industry, Warehouse, and Storage[2]	0	0	0	0	25	0	0	0	0
Office	12,500	25,000	25,000	25,000	0.125	1,563	3,125	3,125	3,125
Retail and Commercial	0	0	0	0	0.125	0	0	0	0
Student Housing[1]	65	129	129	129	180	11,640	23,220	23,220	23,220
Transportation Facility	0	0	0		0	0	0	0	0
Total Non-Residential Sq Ft	**52,118**	**104,235**	**104,235**	**104,235**	**Subtotal Water**	**18,155**	**36,249**	**36,249**	**36,249**
Residential (R[1])									
Single-family - 2 Bedroom	30.75	61.5	92.25	123	280	8,610	17,220	25,830	34,440
Single-family - 3 Bedroom	39.25	78.5	117.75	157	280	10,990	21,980	32,970	43,960
Single-family - 4 Bedroom	16.5	33	49.5	66	280	4,620	9,240	13,860	18,480
Single-family - 5 Bedroom	0.75	1.5	2.25	3	280	210	420	630	840
Townhome/Condo - 2 Bedroom	10	20	30	40	180	1,800	3,600	5,400	7,200
Townhome/Condo - 3 Bedroom	38.75	77.5	116.25	155	280	10,850	21,700	32,550	43,400
Townhome/Condo - 4 Bedroom	7.25	14.5	21.75	29	280	2,030	4,060	6,090	8,120
Townhome/Condo - 5 Bedroom	0	0	0	0	280	0	0	0	0
Apartment - 1 Bedroom	0	0	0	0	180	0	0	0	0
Apartment - 2 Bedroom	0	0	0	0	180	0	0	0	0
Apartment - 3 Bedroom	0	0	0	0	280	0	0	0	0
Apartment - 4 Bedroom	0	0	0	0	280	0	0	0	0
Senior Housing - 1 Bedroom	0	0	0	0	180	0	0	0	0
Total Residential Units	**143.25**	**286.5**	**429.75**	**573**	**Subtotal Water**	**39,110**	**78,220**	**117,330**	**156,440**
					Grand Total (gpd)	**181,969**	**454,244**	**757,066**	**1,305,544**

Multipliers from: Nelson 2004.

Notes:
[1] Units of multipliers are gallons of water per day per unit. Units may be number of rooms, number of structures, or square feet.
[2] Industrial etc. calculated based on employee numbers.

Table N-15 Water Supply Under Alternative 2

Land Use District	5 Years	10 Years	15 Years	20 Years	Multiplier	5 Years	10 Years	15 Years	20 Years
Aviation Related (AR)									
Civic and Cultural	0	0	0	0	0.125	0	0	0	0
Education Facility	0	0	0	0	0.125	0	0	0	0
Hotel or Motel[1]	0	0	0	0	125.00	0	0	0	0
Industry, Warehouse, and Storage[2]	0	0	0	0	25	0	0	0	0
Office	0	0	0	0	0.125	0	0	0	0
Retail and Commercial	0	0	0	0	0.125	0	0	0	0
Student Housing[1]	0	0	0	0	180	0	0	0	0
Transportation Facility	0	0	0	0	0	0	0	0	0
Total Non-Residential Sq Ft	**0**	**0**	**0**	**0**	**Subtotal Water**	**0**	**0**	**0**	**0**
Community Mixed Use (CMU)									
Civic and Cultural	75,305	183,617	348,648	678,712	0.125	9,413	22,952	43,581	84,839
Education Facility	49,744	121,492	231,513	451,555	0.125	6,218	15,187	28,939	56,444
Hotel or Motel[1]	125	250	250	250	125.00	15,625	31,250	31,250	31,250
Industry, Warehouse, and Storage[2]	0	0	0	0	25	0	0	0	0
Office	502,945	1,110,264	1,632,134	2,675,874	0.125	62,868	138,783	204,017	334,484
Retail and Commercial	250,450	577,914	962,988	1,733,136	0.125	31,306	72,239	120,373	216,642
Student Housing[1]	0	0	0	0	180	0	0	0	0
Transportation Facility	0	0	0	0	0	0	0	0	0
Apartment - 1 Bedroom	195	487	975	1,949	180	35,090	87,726	175,452	350,904
Apartment - 2 Bedroom	202	486	892	1,705	180	36,442	87,505	160,610	306,820
Apartment - 3 Bedroom	162	406	812	1,625	280	45,488	113,719	227,438	454,875
Apartment - 4 Bedroom	0	0	0	0	280	0	0	0	0
Senior Housing - 1 Bedroom	130	325	650	1,300	180	23,394	58,484	116,968	233,936
Total Non-Residential Sq Ft	**878,444**	**1,993,287**	**3,175,283**	**5,539,277**	**Subtotal Water**	**265,844**	**627,844**	**1,108,628**	**2,070,194**
Professional Office (PO)									
Civic and Cultural	0	0	0	0	0.125	0	0	0	0
Education Facility	0	0	0	0	0.125	0	0	0	0
Hotel or Motel[1]	0	0	0	0	125.00	0	0	0	0
Industry, Warehouse, and Storage[2]	0	0	0	0	25	0	0	0	0
Office	0	0	0	0	0.125	0	0	0	0
Retail and Commercial	0	0	0	0	0.125	0	0	0	0
Student Housing[1]	0	0	0	0	180	0	0	0	0
Transportation Facility	0	0	0	0	0	0	0	0	0
Total Non-Residential Sq Ft	**0**	**0**	**0**	**0**	**Subtotal Water**	**0**	**0**	**0**	**0**
Business and Technology Industries (B&TI)									
Civic and Cultural	0	0	0	0	0.125	0	0	0	0

Table N-15 Water Supply Under Alternative 2

Land Use District	5 Years	10 Years	15 Years	20 Years	Multiplier	5 Years	10 Years	15 Years	20 Years
Education Facility	0	0	0	0	0.125	0	0	0	0
Hotel or Motel[1]	0	0	0	0	125.00	0	0	0	0
Industry, Warehouse, and Storage[2]	635	1,519	2,759	5,241	25	15,880	37,963	68,980	131,015
Office	101,581	251,453	492,907	975,814	0.125	12,698	31,432	61,613	121,977
Retail and Commercial	19,493	48,734	97,467	194,935	0.125	2,437	6,092	12,183	24,367
Student Housing[1]	0	0	0	0	180	0	0	0	0
Transportation Facility	0	0	0	0	0	0	0	0	0
Total Non-Residential Sq Ft	**564,476**	**1,360,205**	**2,516,475**	**4,829,016**	**Subtotal Water**	**31,014**	**75,486**	**142,777**	**277,359**
Education									
Civic and Cultural	0	0	0	0	0.125	0	0	0	0
Education Facility	72,550	161,566	243,897	408,558	0.125	9,069	20,196	30,487	51,070
Hotel or Motel[1]	0	0	0	0	125.00	0	0	0	0
Industry, Warehouse, and Storage[2]	0	0	0	0	25	0	0	0	0
Office	33,678	77,944	130,889	236,777	0.125	4,210	9,743	16,361	29,597
Retail and Commercial	0	0	0	0	0.125	0	0	0	0
Student Housing[1]	72	148	166	203	180	12,960	26,640	29,880	36,540
Transportation Facility	0	0	0	0	0	0	0	0	0
Total Non-Residential Sq Ft	**106,228**	**239,510**	**374,785**	**645,336**	**Subtotal Water**	**26,238**	**56,579**	**76,728**	**117,207**
Residential (R[1])									
Single-family - 2 Bedroom	31	62	92	123	280	8,610	17,220	25,830	34,440
Single-family - 3 Bedroom	91	208	377	676	280	25,519	58,302	105,615	189,249
Single-family - 4 Bedroom	34	76	136	239	280	9,463	21,347	38,075	66,910
Single-family - 5 Bedroom	1	2	2	3	280	210	420	630	840
Townhome/Condo - 2 Bedroom	19	42	73	126	180	3,357	7,492	13,183	22,767
Townhome/Condo - 3 Bedroom	47	99	159	241	280	13,271	27,754	44,657	67,615
Townhome/Condo - 4 Bedroom	7	15	22	29	280	2,030	4,060	6,090	8,120
Townhome/Condo - 5 Bedroom	0	0	0	0	280	0	0	0	0
Apartment - 1 Bedroom	0	0	0	0	180	0	0	0	0
Apartment - 2 Bedroom	0	0	0	0	180	0	0	0	0
Apartment - 3 Bedroom	0	0	0	0	280	0	0	0	0
Apartment - 4 Bedroom	0	0	0	0	280	0	0	0	0
Senior Housing - 1 Bedroom	0	0	0	0	180	0	0	0	0
Total Residential Units	**229.7316**	**502.704**	**862**	**1,438**	**Subtotal Water**	**62,460**	**136,595**	**234,080**	**389,940**
					Grand Total (gpd)	**385,556**	**896,505**	**1,562,213**	**2,854,700**

Multiplier from: Nelson 2004.

Notes:
[1] Units of multipliers are gallons of water per day per unit. Units may be number of rooms, number of structures, or square feet.
[2] Industrial etc. calculated based on employee numbers.

Table N-16 Wastewater Generated Under Alternative 1

Land Use District	5 Years	10 Years	15 Years	20 Years	Multiplier	5 Years	10 Years	15 Years	20 Years
Aviation Related (AR)									
Civic and Cultural	0	0	0	0	0.119	0	0	0	0
Education Facility	0	0	0	0	0.119	0	0	0	0
Hotel or Motel[1]	0	0	0	0	119.00	0	0	0	0
Industry, Warehouse, and Storage[2]	53	236	897	1,724	24	1,265	5,654	21,526	41,365
Office	0	15,082	75,410	150,820	0.119	0	1,795	8,974	17,948
Retail and Commercial	0	0	0	0	0.119	0	0	0	0
Student Housing[1]	0	0	0	0	162	0	0	0	0
Transportation Facility	385,642	658,452	1,235,502	1,956,815	0		0	0	0
Total Non-Residential Sq Ft	**422,426**	**837,989**	**1,937,007**	**3,310,780**	**Subtotal Wastewater**	**1,265**	**7,449**	**30,500**	**59,313**
Community Mixed Use (CMU)									
Civic and Cultural	28,791	68,574	123,539	233,468	0.119	3,426	8,160	14,701	27,783
Education Facility	20,393	48,114	84,757	158,043	0.119	2,427	5,726	10,086	18,807
Hotel or Motel[1]	125	250	250	250	119.00	14,875	29,750	29,750	29,750
Industry, Warehouse, and Storage[2]	0	0	0	0	24	0	0	0	0
Office	120,703	276,169	449,979	797,601	0.119	14,364	32,864	53,548	94,914
Retail and Commercial	133,708	293,065	421,315	677,816	0.119	15,911	34,875	50,137	80,660
Student Housing[1]	0	0	0	0	162	0	0	0	0
Transportation Facility	0	0	0	0	0	0	0	0	0
Apartment - 1 Bedroom	65	162	325	649	162	10,518	26,296	52,591	105,183
Apartment - 2 Bedroom	94	215	351	621	162	15,245	34,873	56,786	100,612
Apartment - 3 Bedroom	54	135	271	541	252	13,635	34,087	68,174	136,348
Apartment - 4 Bedroom	0	0	0	0	252	0	0	0	0
Senior Housing - 1 Bedroom	43	108	216	433	162	7,012	17,530	35,061	70,122
Total Non-Residential Sq Ft	**303,594**	**685,922**	**1,079,590**	**1,866,927**	**Subtotal Wastewater**	**97,413**	**224,161**	**370,834**	**664,179**
Professional Office (PO)									
Civic and Cultural	0	25,882	51,764	103,527	0.119	0	3,080	6,160	12,320
Education Facility	0	0	0	0	0.119	0	0	0	0
Hotel or Motel[1]	0	0	0	0	119.00	0	0	0	0
Industry, Warehouse, and Storage[2]	0	0	0	0	24	0	0	0	0
Office	0	315,287	630,575	1,261,149	0.119	0	37,519	75,038	150,077
Retail and Commercial	0	31,818	63,636	127,272	0.119	0	3,786	7,573	15,145
Student Housing[1]	0	0	0	0	162	0	0	0	0
Transportation Facility	0	0	0	0	0	0	0	0	0
Total Non-Residential Sq Ft	**0**	**372,987**	**745,974**	**1,491,948**	**Subtotal Wastewater**	**0**	**44,385**	**88,771**	**177,542**
Business and Technology Industries (B&TI)									
Civic and Cultural	2,488	4,975	4,975	4,975	0.119	296	592	592	592

Table N-16 Wastewater Generated Under Alternative 1

Land Use District	5 Years	10 Years	15 Years	20 Years	Multiplier	5 Years	10 Years	15 Years	20 Years
Education Facility	0	0	0	0	0.119	0	0	0	0
Hotel or Motel[1]	0	0	0	0	119.00	0	0	0	0
Industry, Warehouse, and Storage[2]	321	764	1,370	2,583	24	7,708	18,326	32,879	61,985
Office	64,207	152,015	270,022	506,038	0.119	7,641	18,090	32,133	60,219
Retail and Commercial	15,040	34,843	58,661	106,297	0.119	1,790	4,146	6,981	12,649
Student Housing[1]	0	0	0	0	162	0	0	0	0
Transportation Facility	0	0	0	0	0	0	0	0	0
Total Non-Residential Sq Ft	**305,914**	**724,851**	**1,289,966**	**2,420,195**	**Subtotal Wastewater**	**17,434**	**41,154**	**72,584**	**135,445**
Education									
Civic and Cultural	0	0	0	0	0.119	0	0	0	0
Education Facility	39,618	79,235	79,235	79,235	0.119	4,714	9,429	9,429	9,429
Hotel or Motel[1]	0	0	0	0	119.00	0	0	0	0
Industry, Warehouse, and Storage[2]	0	0	0	0	24	0	0	0	0
Office	12,500	25,000	25,000	25,000	0.119	1,488	2,975	2,975	2,975
Retail and Commercial	0	0	0	0	0.119	0	0	0	0
Student Housing[1]	65	129	129	129	162	10,476	20,898	20,898	20,898
Transportation Facility	0	0	0		0	0	0	0	0
Total Non-Residential Sq Ft	**52,118**	**104,235**	**104,235**	**104,235**	**Subtotal Wastewater**	**16,678**	**33,302**	**33,302**	**33,302**
Residential (R[1])									
Single-family - 2 Bedroom	30.75	61.5	92.25	123	224	6,888	13,776	20,664	27,552
Single-family - 3 Bedroom	39.25	78.5	117.75	157	224	8,792	17,584	26,376	35,168
Single-family - 4 Bedroom	16.5	33	49.5	66	224	3,696	7,392	11,088	14,784
Single-family - 5 Bedroom	0.75	1.5	2.25	3	224	168	336	504	672
Townhome/Condo - 2 Bedroom	10	20	30	40	162	1,620	3,240	4,860	6,480
Townhome/Condo - 3 Bedroom	38.75	77.5	116.25	155	252	9,765	19,530	29,295	39,060
Townhome/Condo - 4 Bedroom	7.25	14.5	21.75	29	252	1,827	3,654	5,481	7,308
Townhome/Condo - 5 Bedroom	0	0	0	0	252	0	0	0	0
Apartment - 1 Bedroom	0	0	0	0	162	0	0	0	0
Apartment - 2 Bedroom	0	0	0	0	162	0	0	0	0
Apartment - 3 Bedroom	0	0	0	0	252	0	0	0	0
Apartment - 4 Bedroom	0	0	0	0	252	0	0	0	0
Senior Housing - 1 Bedroom	0	0	0	0	162	0	0	0	0
Total Residential Units	**143.25**	**286.5**	**429.75**	**573**	**Subtotal Wastewater**	**32,756**	**65,512**	**98,268**	**131,024**
					Grand Total (gpd)	**165,546**	**415,963**	**694,258**	**1,200,805**

Multiplier from: Nelson 2004.

Notes:
[1] Units of multipliers are gallons of water per day per unit. Units may be number of rooms, number of structures, or square feet.
[2] Industrial etc. calculated based on employee numbers.

Table N-17 Wastewater Generated Under Alternative 2

Land Use District	5 Years	10 Years	15 Years	20 Years	Multiplier	5 Years	10 Years	15 Years	20 Years
Aviation Related (AR)									
Civic and Cultural	0	0	0	0	0.119	0	0	0	0
Education Facility	0	0	0	0	0.119	0	0	0	0
Hotel or Motel[1]	0	0	0	0	119.00	0	0	0	0
Industry, Warehouse, and Storage[2]	0	0	0	0	24	0	0	0	0
Office	0	0	0	0	0.119	0	0	0	0
Retail and Commercial	0	0	0	0	0.119	0	0	0	0
Student Housing[1]	0	0	0	0	162	0	0	0	0
Transportation Facility	0	0	0	0	0	0	0	0	0
Total Non-Residential Sq Ft	**0**	**0**	**0**	**0**	**Subtotal Wastewater**	**0**	**0**	**0**	**0**
Community Mixed Use (CMU)									
Civic and Cultural	75,305	183,617	348,648	678,712	0.119	8,961	21,850	41,489	80,767
Education Facility	49,744	121,492	231,513	451,555	0.119	5,920	14,458	27,550	53,735
Hotel or Motel[1]	125	250	250	250	119.00	14,875	29,750	29,750	29,750
Industry, Warehouse, and Storage[2]	0	0	0	0	24	0	0	0	0
Office	502,945	1,110,264	1,632,134	2,675,874	0.119	59,850	132,121	194,224	318,429
Retail and Commercial	250,450	577,914	962,988	1,733,136	0.119	29,803	68,772	114,596	206,243
Student Housing[1]	0	0	0	0	162	0	0	0	0
Transportation Facility	0	0	0	0					
Apartment - 1 Bedroom	195	487	975	1,949	162	31,581	78,953	157,907	315,813
Apartment - 2 Bedroom	202	486	892	1,705	162	32,798	78,754	144,549	276,138
Apartment - 3 Bedroom	162	406	812	1,625	252	40,939	102,347	204,694	409,388
Apartment - 4 Bedroom	0	0	0	0	252	0	0	0	0
Senior Housing - 1 Bedroom	130	325	650	1,300	162	21,054	52,636	105,271	210,542
Total Non-Residential Sq Ft	**878,444**	**1,993,287**	**3,175,283**	**5,539,277**	**Subtotal Wastewater**	**245,782**	**579,641**	**1,020,029**	**1,900,805**
Professional Office (PO)									
Civic and Cultural	0	0	0	0	0.119	0	0	0	0
Education Facility	0	0	0	0	0.119	0	0	0	0
Hotel or Motel[1]	0	0	0	0	119.00	0	0	0	0
Industry, Warehouse, and Storage[2]	0	0	0	0	24	0	0	0	0
Office	0	0	0	0	0.119	0	0	0	0
Retail and Commercial	0	0	0	0	0.119	0	0	0	0
Student Housing[1]	0	0	0	0	162	0	0	0	0
Transportation Facility	0	0	0	0	0	0	0	0	0
Total Non-Residential Sq Ft	**0**	**0**	**0**	**0**	**Subtotal Wastewater**	**0**	**0**	**0**	**0**
Business and Technology Industries (B&TI)									
Civic and Cultural	0	0	0	0	0.119	0	0	0	0

Table N-17 Wastewater Generated Under Alternative 2

Land Use District	5 Years	10 Years	15 Years	20 Years	Multiplier	5 Years	10 Years	15 Years	20 Years
Education Facility	0	0	0	0	0.119	0	0	0	0
Hotel or Motel[1]	0	0	0	0	119.00	0	0	0	0
Industry, Warehouse, and Storage[2]	635	1,519	2,759	5,241	24	15,245	36,444	66,221	125,775
Office	101,581	251,453	492,907	975,814	0.119	12,088	29,923	58,656	116,122
Retail and Commercial	19,493	48,734	97,467	194,935	0.119	2,320	5,799	11,599	23,197
Student Housing[1]	0	0	0	0	162	0	0	0	0
Transportation Facility	0	0	0	0	0	0	0	0	0
Total Non-Residential Sq Ft	**564,476**	**1,360,205**	**2,516,475**	**4,829,016**	**Subtotal Wastewater**	**29,652**	**72,167**	**136,476**	**265,094**
Education									
Civic and Cultural	0	0	0	0	0.119	0	0	0	0
Education Facility	72,550	161,566	243,897	408,558	0.119	8,633	19,226	29,024	48,618
Hotel or Motel[1]	0	0	0	0	119.00	0	0	0	0
Industry, Warehouse, and Storage[2]	0	0	0	0	24	0	0	0	0
Office	33,678	77,944	130,889	236,777	0.119	4,008	9,275	15,576	28,176
Retail and Commercial	0	0	0	0	0.119	0	0	0	0
Student Housing[1]	72	148	166	203	162	11,664	23,976	26,892	32,886
Transportation Facility	0	0	0	0	0	0	0	0	0
Total Non-Residential Sq Ft	**106,228**	**239,510**	**374,785**	**645,336**	**Subtotal Wastewater**	**24,305**	**52,478**	**71,491**	**109,681**
Residential (R[1])									
Single-family - 2 Bedroom	31	62	92	123	224	6,888	13,776	20,664	27,552
Single-family - 3 Bedroom	91	208	377	676	224	20,415	46,642	84,492	151,399
Single-family - 4 Bedroom	34	76	136	239	224	7,570	17,078	30,460	53,528
Single-family - 5 Bedroom	1	2	2	3	224	168	336	504	672
Townhome/Condo - 2 Bedroom	19	42	73	126	162	3,021	6,743	11,865	20,490
Townhome/Condo - 3 Bedroom	47	99	159	241	252	11,944	24,978	40,192	60,853
Townhome/Condo - 4 Bedroom	7	15	22	29	252	1,827	3,654	5,481	7,308
Townhome/Condo - 5 Bedroom	0	0	0	0	252	0	0	0	0
Apartment - 1 Bedroom	0	0	0	0	162	0	0	0	0
Apartment - 2 Bedroom	0	0	0	0	162	0	0	0	0
Apartment - 3 Bedroom	0	0	0	0	252	0	0	0	0
Apartment - 4 Bedroom	0	0	0	0	252	0	0	0	0
Senior Housing - 1 Bedroom	0	0	0	0	162	0	0	0	0
Total Residential Units	**230**	**503**	**862**	**1,438**	**Subtotal Wastewater**	**51,834**	**113,207**	**193,657**	**321,802**
					Grand Total (gpd)	**351,573**	**817,492**	**1,421,654**	**2,597,382**

Multiplier from: Nelson 2004.

Notes:
[1] Units of multipliers are gallons of water per day per unit. Units may be number of rooms, number of structures, or square feet.
[2] Industrial etc. calculated based on employee numbers.

N-6 Methodology and Assumptions for Impervious Surface Area Projections

The total impervious surface areas that would result from the implementation of Alternative 1, Alternative 2, and the No-Action Alternative were projected utilizing the final build-out projections identified in the Build-Out Analysis (see Appendix C). The impervious surface area projections include only the NAS Brunswick and McKeen Street Housing Annex properties. The East Brunswick Radio Transmitter Site and Sabino Hill Rake Station properties are not included since minimal development is proposed at these sites. The total impervious surface area includes existing and the potential new surface areas (i.e., buildings, structures, parking lots, roadways, and sidewalks) resulting from the maximum build-out of both Alternative 1 and Alternative 2. The impervious surface area projections are used only for planning and assessment purposes and should not be interpreted as an absolute definition of future conditions upon full build-out of either Alternative 1 or Alternative 2. The final build-out of the installation is subject to many variables outside of the Navy's and developer's control, including future market conditions, changes to local and state land use regulations, and other development factors.

The projected total impervious surface area for each alternative is presented in Table N-18.

Table N-18 Impervious Surface Area Calculations

Land Use District	Zoning Regulations			Build-out Projections				Right-of-Way	Projected Impervious Surface Area	
	Min. Lot Size (sq ft)	Max. Impervious Surface Coverage Allowed per Lot (%)	Max. Impervious Surface Area Allowed per Lot (sq ft)	Projected Number of Lots per Land Use District	New Impervious Surface Area (sq ft)	Existing Impervious Surface Area, Building + Min. Parking (sq ft)	Total - Impervious Surface Area per Land Use District (except right-of-way)	Total Right-of Way and Sidewalk Surface Area (sq ft)	Total Impervious Surface Area per Land Use District (sq ft)	Total Impervious Surface Area per Land Use District (acres)
Alternative 1										
Aviation Operations						9,979,596	9,979,596		9,979,596	229
Aviation Related Business	20,000	0.80	16,000	332	5,312,000	473,117	5,785,117	1,961,235	7,746,352	178
Professional Office	10,000	0.80	8,000	347	2,776,000	0	2,776,000	1,369,248	4,145,248	95
Community Mixed-Use	10,000	1.00	10,000	393	3,930,000	460,524	4,390,524	1,792,174	6,182,698	142
Business and Technology Industries	10,000	0.80	8,000	519	4,152,000	161,902	4,313,902	2,049,962	6,363,864	146
Education	4,000	0.50	2,000	NA	319,000	148,235	467,235		467,235	11
Residential	4,000	0.50	2,000	0	0	2,515,154	2,515,154		2515154.4	57.74
Total									**37,400,148**	**859**
Alternative 2										
Aviation Operations (N/A)										
Aviation Related Business (N/A)										
Professional Office (N/A)										
Community Mixed-Use	10,000	1.00	10,000	1,179	11,790,000	1,212,702	13,002,702	5,381,036	18,383,738	422
Business and Technology Industries	10,000	0.80	8,000	1,062	8,496,000	175,505	8,671,505	4,194,391	12,865,896	295
Education	4,000	0.50	2,000	598	1,515,000	148,235	1,663,235	1,448,785	3,112,020	71
Residential	4,000	0.50	2,000	865	1,730,000	2,515,154	4,245,154	2,511,426	6,756,580	155
Total									**41,118,234**	**944**
No-Action Alternative										
Total	--	--	--	--	**--**	--	**--**	--	**22,490,028**	**516**

Notes:

- Impervious surface area projections are derived from the Build-Out Analysis (see Appendix C for more information).
- The Aviation Operations land use district (Alternative 1 only) includes existing airfield and taxiways (126.8 acres) and aircraft parking areas (102.3 acres).
- Education land use district includes existing buildings and impervious surface area as identified in Bowdoin College's land use plan for the Education/Natural Land Use District (Bowdoin College 2008).
- Total right-of-way surface area includes projected roadways and sidewalks. Derived by subtracting "other factors" (20%) from total partial land use constraint. See Build-Out Analysis (Appendix C) for more information.
- Zoning Regulations are derived from the Town of Brunswick Zoning Ordinance (Town of Brunswick 2009).
- Total impervious surface area for the No-Action Alternative equals the total impervious surface area for existing 2008 baseline conditions. Area was derived through GIS analysis of existing conditions and equals a summary of all existing building floor space, roadways, parking and airfield surface areas.

N-7 References

Maine Department of Labor. 2010. Monthly (July) Not Seasonally Adjusted Labor Force, Employment and Unemployment data in Brunswick Micro for 2010. Available online at: http://198.182.162.220/analyzer/saintro.asp?cat=LAB&session=labforce&time=&geo=. Last Accessed on August 27, 2010.

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