Halifax Regional Municipality

Future Serviced Communities

VOLUME 2:

SANDY LAKE STUDY AREA

January 27, 2025

Prepared for:

Halifax Regional Municipality

Prepared by:

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Executive Summary

Stantec Consulting Limited was retained by Halifax Regional Municipality (HRM) to conduct an analysis of four candidate urban growth areas:

- Sandy Lake in Hammonds Plains/Bedford
- Highway 102 Corridor in Halifax [Northwest Mainland]
- Westphal in Cole Harbour/Westphal/Cow Bay
- Morris Lake in Cole Harbour/Eastern Passage

Stantec's scope was to prepare studies to support decisions on if and how to proceed with further planning initiatives by reviewing the following for each Study Area:

- environmental suitability of the Study Area and portions thereof for development;
- feasibility and costs of transportation network upgrades required to connect the Study Area to surrounding communities;
- feasibility and costs of water and wastewater servicing, upstream water infrastructure upgrades, and downstream upgrades; and
- density targets, distribution and thresholds needed to support the efficient use of infrastructure investments.

This volume summarizes the four component studies for the Sandy Lake Study Area (Study Area). Please refer Volume 1: Overall Summary for context for the entire study. The first volume provides background information on the methodology for the study and an overall comparison of the four Study Areas. The remaining four volumes of this report are stand-alone reports for each Study Area.

This report concludes that while there are certain areas of the Study Area that are not suitable for development for a variety of reasons, there are sizeable parts of the site that could be used to support the need for HRM to accommodate its rapidly growing population in new residential and mixed-use communities. The lands most suitable for development generally coincide with the Hammonds Plains Road corridor in areas set back from Sandy Lake, with setbacks from other watercourses that traverse the various parcels of land. As noted in the reports, there are significant areas of the Study Area that have a flood risk, and those areas should be avoided for new development.

The development of the Study Area will necessitate significant investment in new local infrastructure including sanitary sewer and watermain connections; new stormwater management ponds; and upgrades to Hammonds Plains Road to increase capacity, add dedicated transit and active transportation infrastructure, rebuild the road grade and upsize the culverts upstream of Farmers Dairy Lane.

Background growth in the regional transportation system means that there will be increasing capacity issues over time on Highway 102 (also known as the Bicentennial Highway). HRM and the Province of Nova Scotia will need to work collaboratively on mitigation measures for Highway 102 to prioritize high occupancy vehicle and transit usage. The Province recently announced that based on work done by the

Joint Regional Transportation Agency (JRTA), it will plan to build a connector between Hammonds Plains Road and Highway 101 at Exit 2. This will create alternative connections from any new Sandy Lake community to Bedford, reducing some of the pressure on Highway 102.

The Joint Regional Transportation Agency (JRTA) is a Provincial Crown corporation created through legislation passed in November 2022 to provide collaborative long-range transportation planning for Halifax and surrounding communities within the Halifax-Dartmouth commutershed (i.e., East and West Hants, Colchester, and Kings including towns and First Nation communities within their boundaries). The leading responsibility of the organization is the delivery of a Regional Transportation Plan. According to the JRTA website the Plan "will establish a coordinated and strategic vision for a regional transportation system. The plan will focus on safe, efficient and coordinated movement of people and goods, and any infrastructure needed to make this possible.

Section 3.6 of this report lists the specific recommended infrastructure upgrades. The infrastructure upgrades required to allow development in the Sandy Lake area are quite significant and affect regional transportation and servicing systems. HRM will need to do further negotiations with landowners and potentially the Province for cost sharing. Section 3.7 outlines the recommendations for matters to be considered by HRM in subsequent planning processes.

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Abbreviations

Ac	Acre
BRT	Bus Rapid Transit
CBD	Central Business District
CDAT	Community and Deprivation Audit Tool
CFAD	Canadian Forces Ammunition Depot
CMHC	Canada Mortgage and Housing Corporation
HRM	Halifax Regional Municipality
FSC	Future Serviced Communities
GIS	Geographic Information System
GLA	Gross leasable area
Ha	Hectare
HOV	High Occupancy Vehicle
HW	Halifax Water
Hwy	Highway (i.e., Provincial Highway)
IMP	Infrastructure Master Plan
IRP	Integrated Resources Plan
JRTA	Joint Regional Transportation Agency
LSA	Land Suitability Analysis
LUB	Land Use By-law
MAPC	Metropolitan Area Planning Committee
MPS	Municipal Planning Strategy
PID	Parcel Identification Number
RDP	Regional Development Plan

RFP	Request for Proposals
SAR	Species at Risk
SLCA	Sandy Lake Conservation Association
SLSRRPC	Sandy Lake-Sackville River Regional Park Coalition
SPA	Special Planning Area
Sq. Ft.	Square Feet
SWM	Stormwater management
V/C	Volume to capacity analysis
WESP-AC	Wetland Ecosystem Services Protocol – Atlantic Canada

1.0 Overview of the Future Serviced Communities Project

The Halifax Regional Municipal Planning Strategy (Regional Plan) provides direction on how future settlement should take place in Halifax Regional Municipality (HRM). The Regional Plan outlines the Urban Settlement Designation areas to be considered as potential Future Serviced Communities, namely, Sandy Lake, Highway 102 West Corridor, and Morris Lake Expansion. The Westphal (Akoma) area is identified as Urban Reserve under the Regional Plan and supported for consideration for urban development through the Road to Economic Prosperity Plan for African Nova Scotian Communities.

Stantec won the Request for Proposals (RFP) issued by HRM and have collaborated with the HRM Team to complete all the required background studies for each Future Serviced Community. The next step will be for HRM to review the completed studies and determine if comprehensive neighbourhood planning should be initiated, also known as secondary planning.

The scope of work for Stantec is limited to compiling detailed background information needed to inform future decisions about the potential development of the four Study Areas which includes review of:

- environmental and cultural constraints and opportunities;
- existing transportation infrastructure assets and constraints using multi-modal analysis; and
- existing water and wastewater services infrastructure capacity and constraints.

Stantec will also provide recommendations concerning the potential development of the four Study Areas based on:

- suitability of each Study Area and portions thereof for development;
- feasibility and costs of transportation network upgrades required to connect each Study Area to surrounding communities;
- feasibility and costs of water and wastewater servicing, upstream and water infrastructure upgrades, and downstream upgrades; and
- density targets, distribution and thresholds needed to support the efficient use of infrastructure investments.

This volume summarizes the four component studies for the Sandy Lake Study Area (Study Area). Please refer Volume 1: Overall Summary for context for the entire study.

2.0 Overview of the Sandy Lake Study Area

Sandy Lake is one of three Study Areas subject to the Future Serviced Communities study along with Morris Lake and Westphal designated as a Special Planning Area (SPA) by the Province of Nova Scotia. The area is considered to have high potential for development as the next phase of the extensive Bedford West community.

2.1 Location

Sandy Lake is in northwest Bedford at the northwest edge of HRM's urban core. The Study Area defined by HRM covers roughly 400 hectares west of Sandy Lake and north of Hammonds Plains Road within Bedford/Hammonds Plains **(Figure 2.1).** The area fronts on Hammonds Plains Road between the back property lines of residential lots on the east side of Gatehouse Run to a point corresponding to the easternmost extent of Sandy Lake just to the west of the Hammonds Plains Road-Innovation Drive intersection.

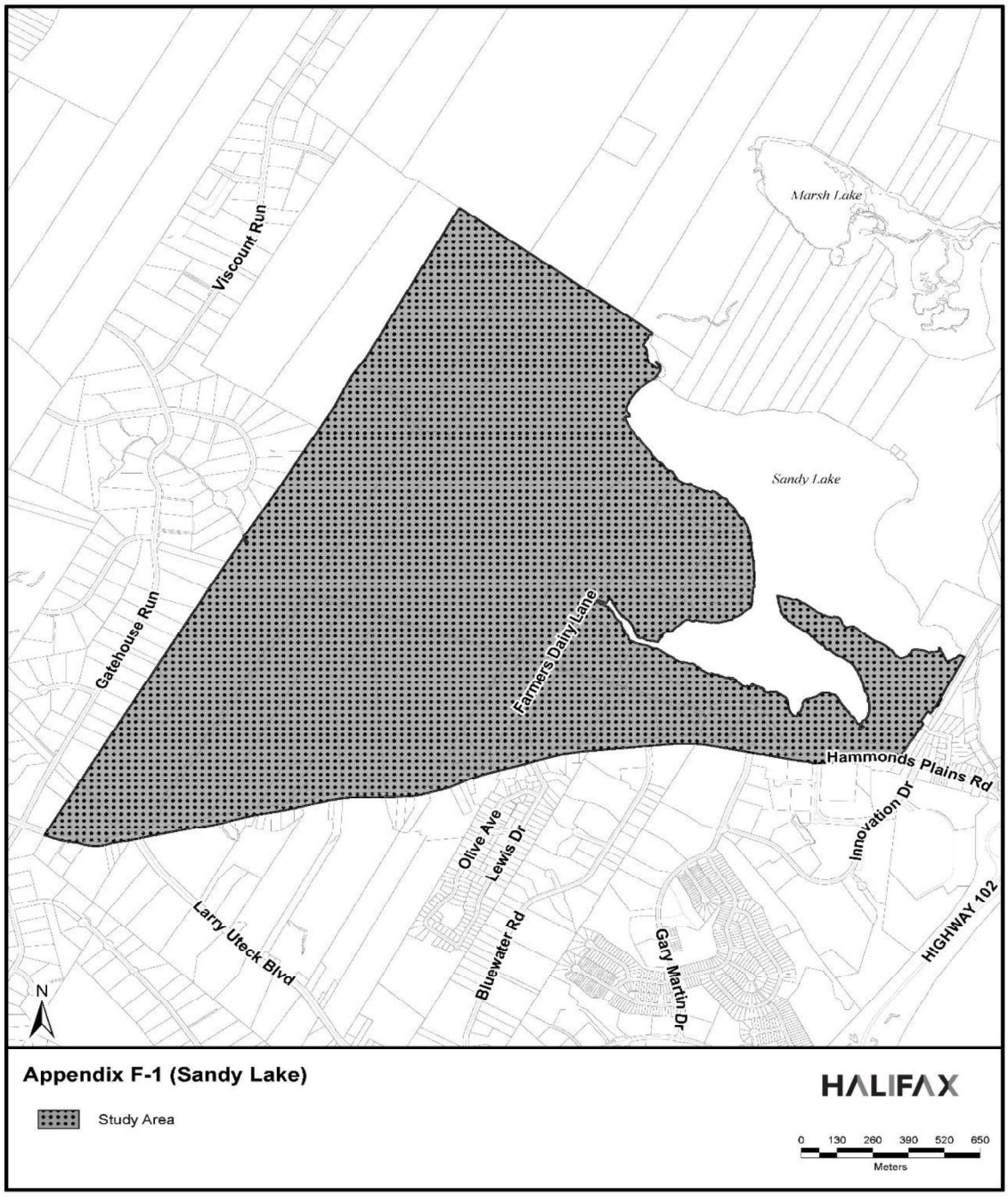

Figure 2.1 Sandy Lake Study Area
(Source: Halifax Regional Municipality)

2.1.1 Existing Land Use

While much of land within the Study Area is undeveloped, there is a mix of residential and commercial uses on the Hammonds Plains Road frontage, a large dairy processing plant on the southwest edge of Sandy Lake, and homes in the same area that are accessed through the industrial property. Land uses fronting on the north side of Hammonds Plains Road include single-detached homes and highway commercial/light industrial uses with direct access to the road (**Figure 2.2**).

Figure 2.2 shows the landowners within the Study Area. One large commercial operation is Halifax Towing, which consists of a network of driveways extending more than 500 metres back from Hammonds Plains Road almost to Sandy Lake that access multiple buildings and storage areas. Mid-way on the Hammonds Plains Road frontage, Giles Drive provides a short loop accessed by several homes to the east of Halifax Towing. Four properties on the north side of Giles Drive (civic numbers 25 to 87) have waterfrontage on the south side of the lake. The remaining waterfrontage on the south side of the lake is occupied by Sandy Lake Academy, a private school and church operated by Seventh Day Adventists that is accessed from a driveway on Hammonds Plains Road as well as via Killarney Drive, a residential street immediately to the east of the Study Area. To the west of Halifax Towing are additional homes and small businesses fronting on Hammonds Plains Road.

The most significant land use in the Study Area is the Agropur dairy plant, which is better known locally as Farmers Dairy. Most residents and travelers on Hammonds Plains Road have little awareness of the plant beyond a prominent sign at its driveway entrance because it is setback substantially from the road. The large, gated plant is accessed via Farmers Dairy Lane, which meets Hammonds Plains Road immediately west of Halifax Towing and extends nearly 500 metres from Hammonds Plains Road crossing Johnson's Brook, a substantial watercourse that feeds into Sandy Lake. Before the brook, on the north side of Farmers Dairy Lane is a lagoon used to treat plant effluent. The plant itself is at the end of the roadway screened from surrounding land uses by heavy vegetation.

Roads built in conjunction with the dairy plant allow property owners to access homes, seasonal properties, and undeveloped lots on the west side of Sandy Lake by using Farmers Dairy Lane and crossing the edges of the plant property. Granter Road, which runs along the outside of the fence in front of the plant accesses several properties immediately east of the plant. Additional lakefront lots have been subdivided but do not have road frontage. A limited road network behind the plant comprised of Lauder Way and a cul-de-sac named Sarty Lane similarly accesses a small number of homes and seasonal residences to the north of the plant but does not reach several lots that are, consequently, vacant, and forested. One landowner we interviewed who does not have access to a road said that he parks his vehicle on the plant parking lot and walks to his property. Before the plant was built, property owners on the lake reportedly reached their properties by boat.

Lands to the west of the dairy plant to Gatehouse Run include large vacant tracts owned by Clayton Developments Limited. The properties owned by Clayton extend to the northern edge of the Study Area and have extensive frontage on Hammonds Plains Road but are punctuated by several residential and commercial lots mentioned to the west of Halifax Towing.

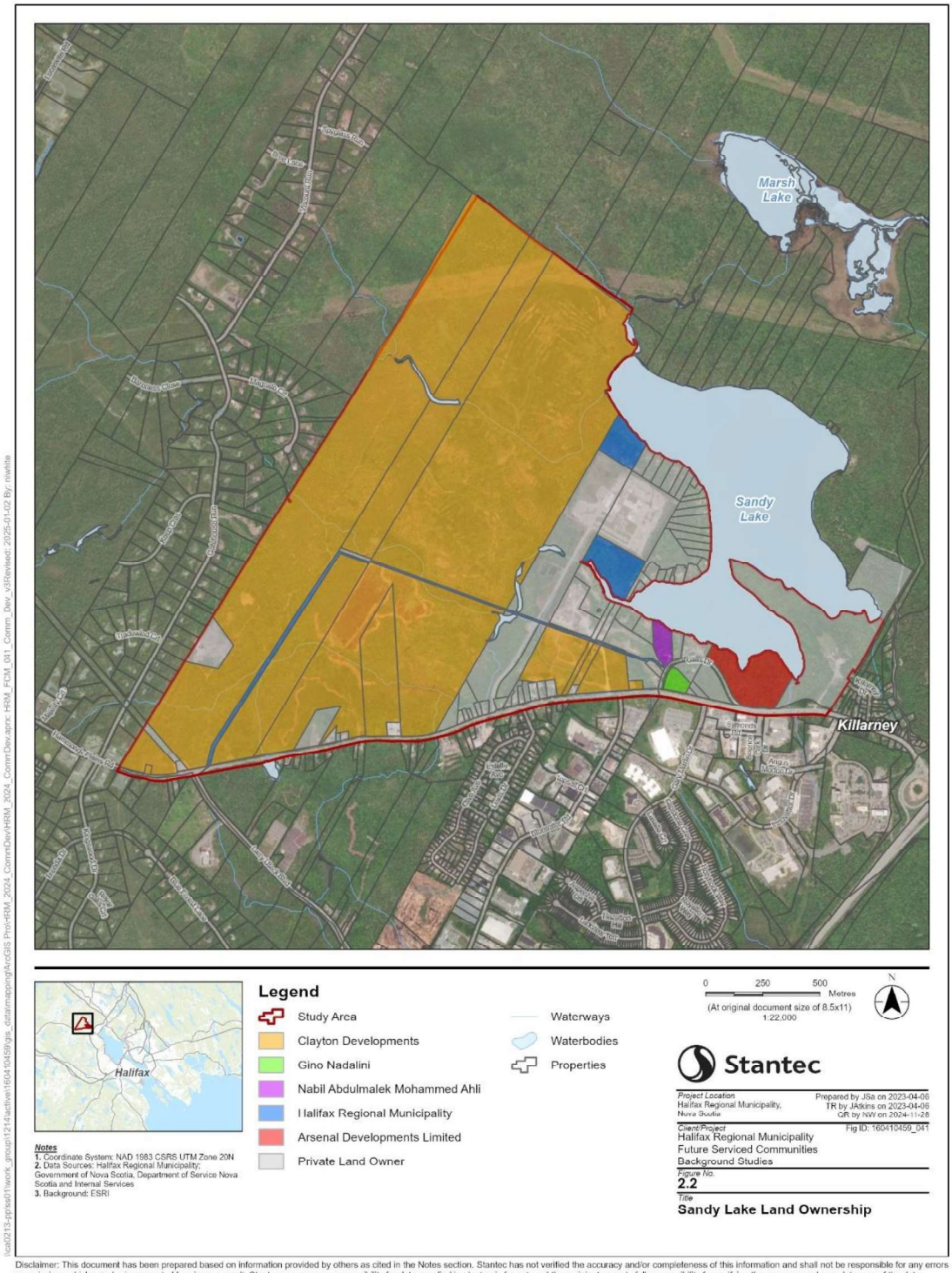

Figure 2.2 Sandy Lake Study Area – Land Ownership Map

Identification numbers (PIDs) 00417949 and 4112945 before they sold both lots to Clayton in 2014. Foliage is growing back but the clearcut area, which is on the eastern half of Clayton's large holdings abutting the Agropur property, is still distinct on aerial photographs of the Study Area.

Lands around Johnsons Brook at the eastern edge of the proposed development property were subject to a forest fire that occurred at the same time as more extensive forest fires that swept through the communities of Upper Tantallon and Hammonds Plains at the beginning of June 2023. Some areas north of the brook have reportedly been charred by the fire. The firefighting effort included emergency cutting of a fire break in the area close to the brook.

2.1.2 Adjacent Land Use

Lands to the north of the Study Area are currently undeveloped over a distance of approximately 2.5 kilometers to Highway 101 and the community of Lower Sackville. The lands are largely publicly owned and have been discussed for many years as the potential site of the proposed Sandy Lake Regional Park. The remaining three sides of the Study Area, by contrast, have seen significant development. Between the eastern edge of the Study Area and the Highway 102 interchange that accesses Hammonds Plains Road are subdivisions comprised largely of single-detached homes fronting on Killarney Drive and Smiths Road. Smiths Road, furthermore, accesses Sandy Lake Park, which consists of 100 acres of municipally owned land on the western shore of Sandy Lake. The Park provides trails and a supervised beach with other amenities on the lake.

To the west of the Study Area, Gatehouse Run provides access to an estate lot subdivision largely comprised of single-detached homes. Gatehouse Run extends roughly 2 kilometers parallel to the western edge of the Study Area. At its northern end, it branches into several shorter roads that are either planned cul-de-sacs or temporary dead-end roads awaiting connection to streets serving currently undeveloped lands to its west.

Development south of Hammonds Plains Road is much more intense. The most prominent land use facing the Study Area lands across Hammonds Plains Road is the Greenfoot Centre, a major regional recreation centre providing four ice surfaces. Beyond the Greenfoot Centre and commercial uses on the Hammonds Plains Road frontage is Stonington Park, which provides a mixture of residential uses ranging from single-detached houses to medium and high-rise apartment structures, as well as a seniors housing complex managed by Northwoodcare Bedford. Stonington also features Charles P. Allen High School and its associated recreational amenities, which include a gym and sports fields as well as the Bedford-Hammonds Plains Community Centre joined to the high school structure.

Bluewater Road and Larry Uteck Boulevard terminate on the south side Hammonds Plains Road where it abuts the Study Area. Bluewater Road is the primary collector road for the Atlantic Acres Industrial Park and runs through the park to connect to Kearney Lake Road. The intersection with Larry Uteck is just to the east of Gatehouse Run and provides direct access to two separate interchanges on Highway 102 via Larry Uteck Boulevard and Kearney Lake Road.

2.1.3 Site Background

Land Development

The Study Area has historically had access to Hammonds Plains Road, which was developed in the early nineteenth century when the Hammonds Plains area supported a forestry industry and numerous coopers or barrel makers.[1] Hammonds Plains Road also connected west Bedford at Mill Cove to Tantallon and the Head of St. Margarets, while serving as the primary connection to Halifax for historic communities such as Lucasville and Yankeetown. More recently, multiple suburban communities have developed adjacent to it, including Uplands Park and Highlands Park in the 1970s, and Kingswood, Glen Arbour, and Voyager Lakes since the early 1990s. Sandy Lake itself attracted a small number of seasonal residents in the twentieth century, while Hammonds Plains Road developed with the mixture of residential and commercial uses.

While Lucasville, Yankeetown, and other communities that access Hammonds Plains Road have long histories dating from the early nineteenth century, and later communities such as Uplands date from the 1960s and 1970s, substantial development did not begin until the 1990s when Kingswood Subdivision was built on the south side of Hammonds Plains Road to the west of the Study Area. The large lot development, which has access to the municipal water supply but not to the wastewater network, was emulated in subsequent years by Kingswood North and West, Glen Arbour on the north side of Hammonds Plains Road from Kingswood, and Voyageur Lakes farther to the west, all of which consist predominantly of single-detached homes that rely entirely on onsite services.

Beginning around the turn of the current century, fully serviced urban development began to progress toward Hammonds Plains Road. To a degree, development in the Town of Bedford moved up Hammonds Plains Road from the Bedford Highway, but the more substantial wave began farther south with the construction of Larry Uteck Boulevard between Bedford Highway and Highway 102. Older communities like Clayton Park were developed in accordance with master plans created and implemented by their developers. Larry Uteck Boulevard formed the spine of the development now formally called Bedford South but more commonly referred to simply as “Larry Uteck.” The extensive community, which was one of the first in HRM built to a comprehensive master plan, offers a wide range of fully serviced housing types from single-detached homes to apartment structures with substantial commercial facilities concentrated at the interchange through which Larry Uteck Boulevard accesses Highway 102.

Development eventually crossed the highway at the interchange and numerous high-rise structures have been built near the highway access. Lands on the west side of the highway are typically called Bedford West and have a similar mix of residential types as Bedford South. Clayton has developed the land through a master plan as the Parks of West Bedford comprising Cascades Park closest to the Hwy 102 interchange, Waterberry Park and Brookline Park to its west, and Stonington Park to the north. Stonington extends to the south side of Hammonds Plains Road where it faces the Study Area.

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[1] hammondsplainshistoricalsociety.ca, “History of Hammonds Plains,” https://www.hammondsplainshistoricalsociety.ca/history-of-hammonds-plains/#:~:text=The%20Hammonds%20Plains%20road%20was,known%20as%20the%20Lucasville%20Road.

The primary holding is owned by Clayton and its proposed mixture of low to high-density housing types resembles Stonington Park. As noted, the land was previously owned by Armco Development, which developed Kingswood. In 2013, Armco clearcut the land before selling it to Clayton Developments in 2014. Clayton now owns 670 acres of land in the Study Area.

In a 2006 report for the Class 1 Environmental Assessment for the proposed Highway 113 link, which is proposed to follow a route to Tantallon to the south of the Study Area, the Nova Scotia Department of Transportation and Public Works stated that Hammonds Plains Road was at capacity and growth controls would be required to prevent worsening the situation. The designation of Sandy Lake as an Urban Settlement area in the first HRM Regional Plan in 2006, as well as other growth controls, partially addresses this concern, although development continues at other sites on Hammonds Plains Road and roads that feed into it. As development has proceeded, roads have been upgraded. Hammonds Plains Road now has four lanes with light-controlled intersections to Gary Martin Drive across from Sandy Lake but returns to two lanes through the balance of the Study Area. It is two lanes for most of its run westward to Upper Tantallon, as well, except for several intersections that have dedicated left-turn lanes. If and when Highway 113 is developed, it is expected to relieve through traffic moving between Highway 102 and Tantallon.

Regional Park

Development of a regional park in and around the Sandy Lake area has been the subject of debate since the 1970s. Plans at various points have called for reservation of at least some of the Study Area for parkland, extension of industrial development, and possible residential development. The Sandy Lake Conservation Association (SLCA) website provides a good summary of these events beginning in 1971 when the timeline summarized on the site states P.B. Dean, Wildlife Biologist with the Canadian Wildlife Service, identified Sandy Lake as one of seven important natural areas in the Halifax-Dartmouth Region that should be preserved as regional parks – a proposal that was accepted later that year by the Metropolitan Area Planning Committee (MAPC) Recreation Work Group.

The Recreation Work Group was contributing at the time to preparation of the first regional plan for the urban and urbanizing area at the core of what was then referred to as Halifax County. The Halifax-Dartmouth Regional Development Plan (RDP) was adopted in 1975 and identified seven proposed parks:

- a Coastal Complex in the Cole Harbour-Lawrencetown area
- Hemlock Ravine
- the Flood Plain Complex around Sandy Lake, Marsh Lake, and the Sackville River
- Admirals Cove
- the Halifax Watershed Complex (i.e., Long Lake, and First and Second Chain Lakes)
- McNab's Island
- the Canal/Lake Complex along Lake Micmac, Lake Charles, and Lake William

Each park listed is delineated on the Urban Form Policy Map that accompanied the RDP. They are described in the Plan as "relatively large natural areas," although it is also clear that they were expected to provide recreational opportunities as well as environmental protection.

The proposed Sandy Lake Park is depicted on the RDP map (**Figure 2.3)** as surrounding Sandy Lake and Marsh Lake and taking in most of the Sackville River, as well as adjacent lands between Highway 102 and the Lucasville Road. The limits of the park are defined by sweeping curves like most land use designations on the Urban Form Policy Map. The representation was not intended to define the specific boundaries of the park, although it would be fair to say that the park polygon around Sandy Lake encompasses the major environmental assets that the park was intended to protect. At the time, lands surrounding the proposed park were rural, although the road network of Atlantic Acres Industrial Park is clearly visible on the Policy Map. The RDP map designated lands immediately to the south of Hammonds Plains Road Urban Mix (Residential First Priority), while lands to the north and west were designated Urban Mix (Residential Second Priority).

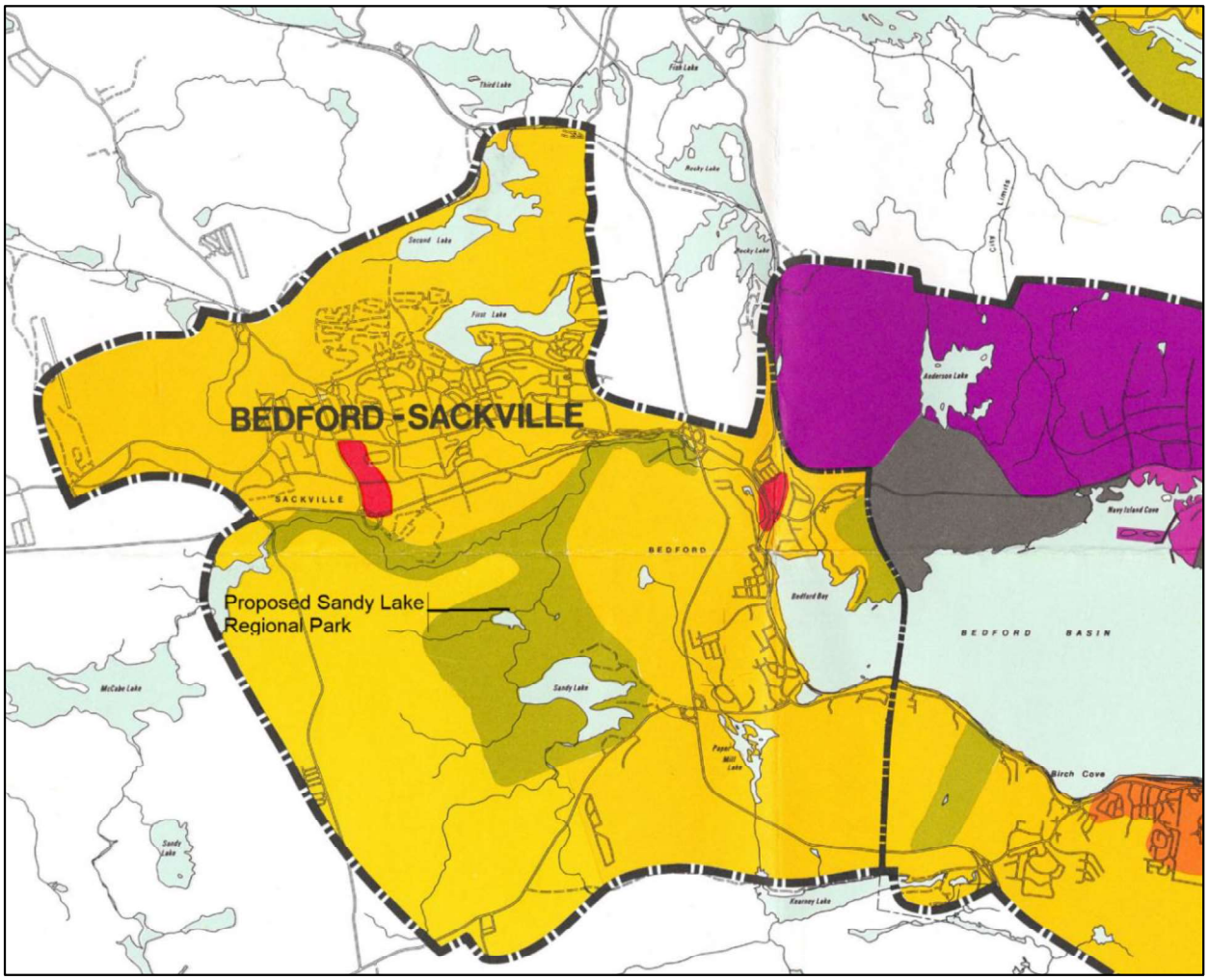

Figure 2.3 Proposed Sandy Lake Park

(Source: Halifax-Dartmouth Regional Development Plan, 1975, Urban Form Policy Map)

In 1973, the County of Halifax began development of Atlantic Acres Industrial Park, which now stretches from the south side of Hammonds Plains Road to Kearney Lake Road. According to the Sandy Lake Conservation Association (SLCA) website, the County's aspirations for industrial development in the area caused it to turn down an offer of 500 acres of land to the west of Sandy Lake from the widow of its then owner, whose only condition was that the park be named after her late husband. The County, instead, arranged for the current Agropur Dairy Plant to be located on the abutting property. The RDP adopted in 1975 nevertheless designated Marsh Lake, Sandy Lake, and the Sackville River Floodplain as the site of a future regional park.

With the creation of the Town of Bedford in 1980, jurisdiction over the lands comprising the Study Area passed to the Town from Halifax County. The Town, on its formation, undertook to prepare a Municipal Plan covering all land within its limits including Sandy Lake. The planning process provided a forum for debate concerning the area of the proposed park and development in the Sandy Lake area. Members of the Sandy Lake Ratepayers Association, although they appear to have been supportive of the park proposal, expressed concerns about their property rights if the lands were incorporated in the park. The Bedford Municipal Planning Strategy adopted in 1982 designated Sandy Lake as a Secondary Development Area and required properties to be developed be more than 5 acres and have direct access to a public road in keeping with requirements for all properties outside the residential development boundary that was defined in the 1976 Halifax Regional Development Plan.

The boundary continues to be a feature of the current RMPS where it is defined by the limits of the Urban Settlement Area shown on the Generalized Future Land Use Map (RMPS Map 2).Under the Bedford Land Use By-law (LUB), current zoning of lands proposed for residential development in the area is predominantly Rural Residential (RR), which limits development to single-detached dwellings on lots of at least 5 acres as before, although it now also permits "Shared housing use with 10 or fewer bedrooms in conjunction with a permitted dwelling unit."

Limited development rights outside the residential development boundary discouraged development as intended; however, the SLCA suggests it diminished awareness of the park proposal and "***opened the area up to interest from developers for future larger housing development***" [emphasis in original], presumably because the intention to create a park was not declared by its labelling as a "Secondary Development Area" (although the RDP continued to be in effect with Sandy Lake listed as one of seven future regional parks).

While the extent of the future park was not established by the Town, it and, subsequent to amalgamation in 1996, HRM have continued to acquire land in the area through donations, dedications, and purchases. Immediately after amalgamation, Jack Lake lands that had been intended for housing development by CMHC were granted to the Municipality by the Province for a regional park when CMHC determined a costly highway interchange would have to be built to access the area. The majority of land immediately north of the Clayton holding within the Study Area is now owned by HRM through acquisitions by the County of Halifax and the Town of Bedford, as well as the Regional Municipality itself between 1954 and 2021. The Municipality now owns roughly 550 acres north of Sandy Lake extending eastward to the Bedford Rifle Range, which is owned by the Department of National Defence. The municipal holding is not however contiguous. Several properties north of Sandy Lake remain in private hands.

All seven regional parks proposed by the 1975 RDP have been developed to some degree, with some being fully realized. The 2016 RMPS confirms HRM's commitment to creating Jack Lake Park under municipal ownership subject to study to determine its boundaries and appropriate development of "remainder lands." The draft revision of the RMPS now before the public retains this commitment stating, "[t]he Municipality has an active program to include additional lands to support the further development of this nature park".

The municipal park is well-established on the eastern and northern shores of Sandy Lake, but it covers only a modest portion of the area illustrated on the RDP map. More recently, the park area has been defined over a more limited area than suggested by the RDP but with more precise boundaries. The proposed boundary illustrated in a 2015 HRM Staff Report discussing a proposed land exchange by Armco in favour of the regional park follows roadways and property boundaries. It varies from the RDP outline in the south and west at Sandy Lake where it no longer includes lands on that side of the lake other than the area to the north of the eastern half of Giles Drive extending eastward over the Sandy Lake Academy property. It also excludes the CFAD Bedford Rifle Range, which occupies the northeast quadrant of the park area depicted on the RDP Map. It does however continue to include nearby federally owned lands extending from the eastern shore of Marsh Lake that encompass a smaller lake and watercourses that feed from the lake to the Sackville River.

Most of the Study Area is currently subject to the Halifax Municipal Planning Strategy and Land Use By-law. Several municipally owned properties within the Sandy Lake area defined for this study and the largely separate Regional Park area referred to in the 2015 HRM Staff Report are zoned Park (P). The large property surrounding Jack Lake, which the Municipality acquired from CMHC in 1999, is zoned Regional Park (RPK). Two properties abutting the Agropur Dairy Plant property to the south and north are zoned P as well. Both properties were acquired in 1992 by the Town of Bedford from Agropur's predecessor company, Farmers Dairy **(Figure 2.4**).

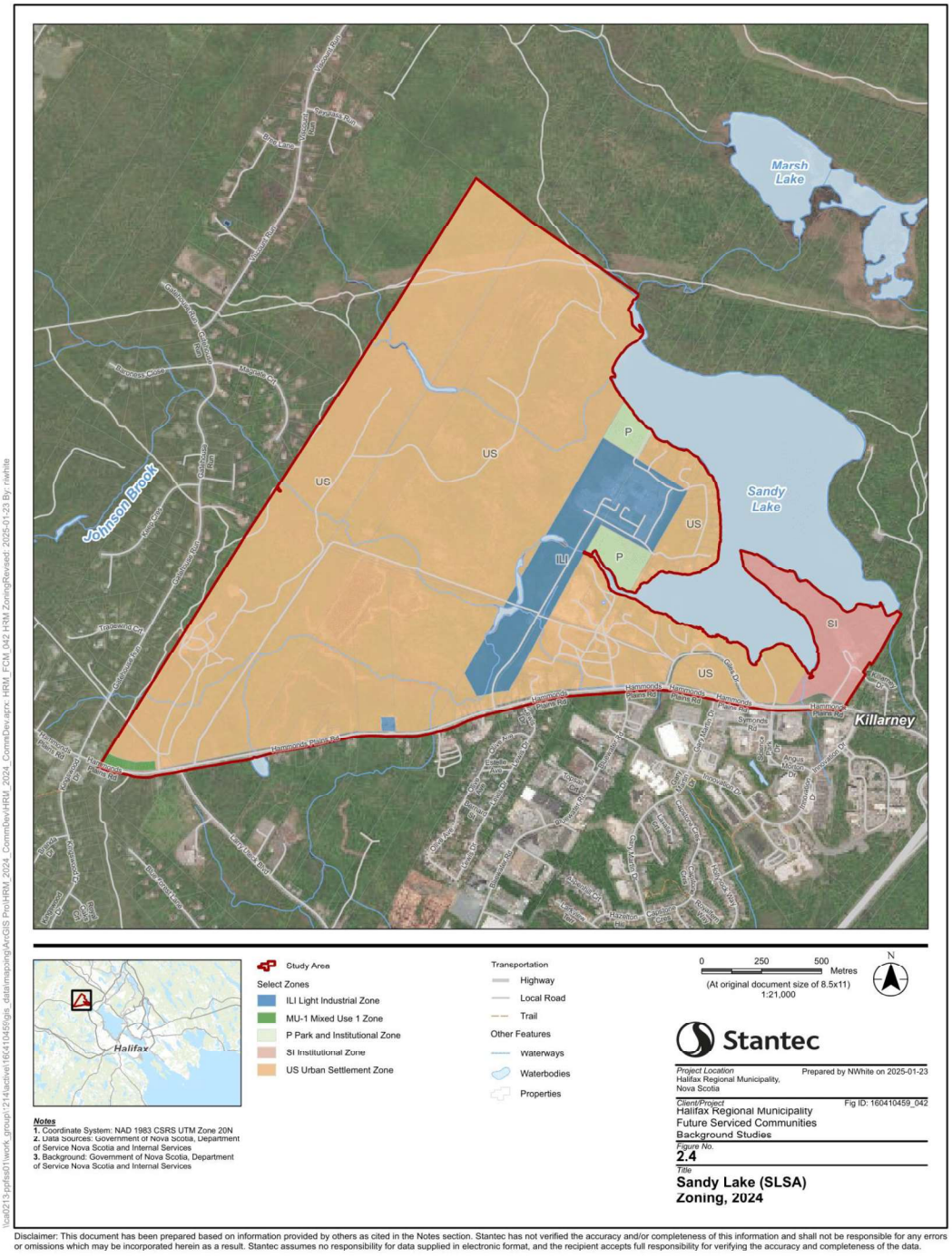

Figure 2.4 Sandy Lake Zoning, 2023

(Source: Bedford Land Use Bylaw, Schedule A – Zoning Bylaw, 2022)

The P Zone permits community and recreational centres; playgrounds and playing fields; recreational uses; public parks; uses of a similar nature to the foregoing; and accessory uses including a refreshment booth or pavilion. The RPK Zone permits recreation uses, conservation uses and uses accessory to recreation and conservation uses. Of the properties zoned P or RPK, only PID 00417360 on the northeast shore of Sandy Lake, which the Town of Bedford acquired in 1987, has been formally developed as a park. The municipal holdings clearly, however, constitute a land assembly for the purpose of developing a regional park consistent with HRM's recent definition. The two parcels abutting the Agropur property are not generally accessible to the public as potential users would currently have to cross the dairy plant yard to get to either property.

The western edge of the Sandy Lake area designated for this project is subject to the Beaver Bank, Hammonds Plains and Upper Sackville MPS and LUB. The largest property within the second planning areas is PID 40202806, which covers 80.9 Ha and is owned by Clayton Developments. Clayton also owns PIDs 00646000 (25,860 square meters) and 00421024 (11,613 square feet), which front on Hammonds Plains Road and are separated from the larger holding by a Halifax Water right of way that runs from the Pockwock Reservoir.

The company intends to develop these properties with its adjacent lands as discussed below. The Beaver Bank MPS designates the property Mixed Use B (MU-B). Text in the MPS states "[t]he Mixed-Use B Designation follows the Hammonds Plains, Upper Hammonds Plains and Lucasville Roads and, as with Beaver Bank, it excludes the larger residential subdivisions developed on local streets." It further states that lands in the designation are predominantly "low density residential" with "several business, industrial, resource and community facility uses, many of which are small scale or are located on a residential lot."

PID 40202806 is zoned US (Urban Settlement) Zone, which limits development to single-detached dwellings on 2 hectares (5 acres) of land in accordance with the limitations historically placed on Sandy Lake under the Bedford MPS and LUB. The Halifax Water right of way and most of PID 00646000 are largely zoned US as well; however, the lands of PIDs 00646000 and all of 00503444 are zoned MU-1 (Mixed Use 1), which permits residential structures with up to four units, senior homes and some additional residential types, commercial uses, and some industrial uses.

The current RMPS, however, contains a much more expansive vision for the area. The RMPS designates the area "Urban Settlement." The designation means the area may be considered suitable for development with municipal water and sewer services. Sandy Lake is identified as one of three "future serviced communities" along with Port Wallace, which is currently under development, and Highway 102 Corridor, which is one of three other areas being assessed by this project.

2.1.4 Stakeholder Consultation

The Study Area is comprised of 60 properties. Stantec contacted Clayton Developments at the outset of the project to determine their development plans, as the company's interest in development was well-known. Other property owners were subsequently contacted through a mail-out based on owner addresses recorded in Nova Scotia Property Online. While some property owners own more than one property, approximately 45 to 50 separate individuals or corporate entities were reached. The mail-out was intended to ensure all property owners were aware they were within an area subject to the Future

Serviced Communities project. It included an offer for owners to consult with Stantec online or in person, which several landowners accepted.

Clayton Developments provided the concept plan seen in **Figure 2.6** and met with Stantec team members to discuss the main features of their proposal. They shared environmental and traffic studies they have commissioned to assess their development proposal as well as estimates of dwelling units and population for their concept design.

Stantec has had conversations online or in person with twelve property owners in addition to meeting with Clayton representatives. Owners were generally aware of potential development in the area through previous contact with Armco or Clayton, or awareness of past debates concerning the regional park and other planning initiatives in the area. Most were also aware that the Province had designated the area as a SPA for priority development. Contacts can roughly be divided into owners of residential property on Sandy Lake, owners of lands on Hammonds Plains Road east of the Clayton holdings, and owners of lands on Hammonds Plains Road that back onto Clayton lands.

Owners in the last group on Hammonds Plains Road in front of the Clayton Developments properties expressed mixed feelings concerning the development proposal. They see it as changing the community character with which they are familiar. Those we spoke to indicated they had contact with Armco when the company clear cut the area as Armco asked for access through some properties and left an area uncut to function as a buffer abutting back property lines. They stated they have been approached by Clayton, because their proposed development would benefit from having uninterrupted frontage on Hammonds Plains Road. One owner was very critical of the clear cut and the process that followed and suggested that he had little faith that the new proposed community would be built with any better consideration of affected neighbours. Owners we spoke to said they were willing to sell for a satisfactory price and would move elsewhere.

Owners on the remaining Hammonds Plains Road frontage to the east of the proposed development site expressed a mixture of intentions. Some were interested in being rezoned so they could pursue commercial development opportunities, most notably a contractor's yard/building material operation. zzap Architecture and Planning submitted concept plans on behalf of Arsenal Developments for proposed residential developments at 25 and 87 Giles Drive. The owner of 593 Hammonds Plains Road at the corner of Giles Drive and Hammonds Plains Road has expressed an interest in developing a 15-storey apartment building with 300 dwelling units and ground floor commercial space.

Existing residential property owners on Giles Drive and Hammonds Plains Road to the east of the Agropur property were not opposed to the proposed Clayton Development but did express concerns with lake water quality and other potential environmental impacts similar to environmental advocates with the Sandy Lake-Sackville River Regional Park Coalition (SLSRRPC aka Sandy Lake-Sackville River Conservation Coalition and Sandy Lake Conservation Association). Several noted, however, that as recreational users of the lakes and surrounding woodland, they did not support the level of controls favoured by the Coalition. Residential owners may not be aware of the plans being advanced by their neighbours and did not address the various proposals in their vicinity that we were familiarized with over the course of the consultation process.

The variety of ambitious schemes put forward suggest there is interest in developing on a similar scale to Clayton's Sandy Lake project as a mixture of residential and commercial users. Clayton, in fact, has proposed developing lands between Farmers Dairy Lane and Giles Drive now occupied by Halifax Towing as part of its overall development scheme. On their concept plan, this secondary area, which they own through Sandy Lake Developments, is accessed via an extension to Bluewater Road that they propose to begin at a proposed roundabout that will replace the current intersection of Bluewater Road and Hammonds Plains Road. The so-called Bluewater Road Extension crosses Farmers Dairy Lane to provide secondary access to Clayton's larger development area.

Abutting the roundabout in Clayton's plan is a proposed mixed commercial area and on the north side of the Bluewater Road Extension are three multi-unit apartment buildings. The mix that adjacent landowners propose to the east is similar and likely compatible with Clayton's plan as well as existing development on the south side of Hammonds Plains Road. The cumulative effect of large-scale residential and commercial development, however, will add pressures to Hammonds Plains Road and other local road links that the current Traffic Impact Statement prepared for Clayton has not taken into account. It will also add to demands on water and wastewater networks expected to serve the Study Area.

Stantec contacted Agropur directly because the extension of Bluewater Road proposed by Clayton crosses their land and contacts in the area suggested the dairy plant operator was not in favour of the idea. Agropur's representative, in fact, confirmed that he and colleagues with the company had discussed possible sale of land to Clayton for the purpose of accommodating the proposed road and decided against it. The representative we talked to said Agropur is concerned with the Clayton proposal largely because of the potential for conflicts between additional residents in the area and their industrial operation.

Although the Agropur plant is set well back from Hammonds Plains Road and is not visible from the road or adjacent areas, it is bordered on two sides by permanent and seasonal residences on Sandy Lake that are accessed through their plant yard, which some property owners and visitors use for parking. While Agropur and its neighbours have managed this situation since construction of the plant in the 1980s, the company's representative said that it does create challenges, most notably for plant security. He said a development on the scale proposed by Clayton would raise the likelihood of conflicts significantly.

Agropur is happy with their current location. The site is within the largest population centre in Nova Scotia and affords them good access to both Highway 102 and Highway 103 via Hammonds Plains Road, allowing them to easily distribute their products throughout the province. They are looking forward to expanding production within the current plant and could consider expanding the plant if demand for their products increases.

Owners with properties on Sandy Lake are primarily concerned with preserving their quality of life and expressed no interest in development beyond building homes for relatives on their current properties, which in some cases include vacant lots. They were naturally concerned with the potential impact of development on lake waters and expressed the hope that watercourses will be buffered to limit runoff. When we assured interviewees that current regulations restrict development within 20 metres of a watercourse and are proposed to be increased to 30 metres in the recently released draft RMPS, one

said they should be maintained in public ownership as private property owners cannot be relied on to adhere to limitations on cutting and other activities within buffer areas.

Aside from developers and property owners, Stantec also made contact early in the project with the SLSRRPC. The group has had a long-standing interest in protecting the lands in the Sandy Lake area and in the establishment of the Sandy Lake Regional Park. Representatives of the group met with Stantec team members in Stantec's offices and had a follow-up meeting with Stantec online. They set out their position on development in the area and provided Stantec with an extensive list of background materials and studies relevant to consideration of the Study Area, the regional park proposal, and general environmental concerns, including studies and submissions prepared by Coalition members. They provided many of the documents to Stantec and have since continued to provide materials relevant to Sandy Lake.

The Coalition is opposed to development in the Study Area and would prefer all the proposed development lands to be incorporated in the proposed regional park. Failing its acquisition as parkland, they emphasized the need for generous wildlife corridors through the area and substantial riparian buffers around all watercourses. They were critical of past water quality assessments and provided a study of local water quality prepared by member Dr. David Patriquin, a retired biology professor from Dalhousie University. They also argued that assessment of the water quality should include the entire Sandy Lake-Sackville River watershed, not just the Study Area, which was beyond the scope of Stantec's study.

Attitudes to use of the lake vary among owners of waterfront land. As noted, some property owners stated that while they share many of the objectives of the SLSRRPC, they are recreational users of the lake and surrounding areas. They use motorized boats on the lakes and all-terrain vehicles in the forest and want them to be permitted with appropriate controls. Others were critical of motorboat use noting that the lake is small, and swimmers regularly swim across it raising the concern that a motorboat could collide with a swimmer. Owners on Sarty Lane are restricted from using motorboats by a covenant in their deed and other lakefront owners choose not to use them. The law, however, does not limit their use and motorboats are used by some property owners. One property owner, while understanding concerning the proposed development, noted that the lake will be accessible and attractive as a convenient swimming place for many residents of Clayton's proposed community leading to the possibility that the number of swimmers could increase dramatically, which would add to current safety and environmental concerns, and potentially diminish the enjoyment of existing lakefront residents.

Although Stantec's mandate is to consult with property owners within the Study Area, we contacted United Gulf Developments on the recommendation of HRM staff. United Gulf owns five properties covering 15 Ha clustered at the northwest corner of the Clayton Development lands in the Sandy Lake area (PIDs 41178773, 40203697, 41181744, 40203721, 40203671) (**Figure 2.5**). The company also owns 81 Ha at Papermill Lake that access Hammonds Plains Road on the south side of the Highway 102 interchange serving Hammonds Plains Road.

United Gulf's President expressed concern that Clayton's Sandy Lake concept plan shows only parkland abutting their property and provides no direct road connection to their lands. While United Gulf expects to develop its land in the longer term, they suggested that the eventual development of their holdings could provide a connection through their land to a planned extension of Margeson Drive from Highway 101, to

which it is currently connected, to Hammonds Plains Road, a link that could relieve Hammonds Plains Road of a portion of the substantial traffic that new development appears likely to generate.

Papermill Lake, in contrast, is an immediate proposition. United Gulf has already developed lands on the south side of the lake with low- to medium-density housing at roughly 9 dwelling units per acre. The company wishes to develop the balance of their land on the north side of the lake, which abuts Highway 102, with higher density residential development at approximately 35 units per acre or roughly 7,000 total units, which is very similar in scale to Clayton's proposal for Sandy Lake. United Gulf's proposed development at Papermill Lake would impact several transportation links on which development at Sandy Lake will also rely, most notably the Highway 102 interchange and the section of Hammonds Plains Road between the 102 and Bedford Highway. Papermill Lake will also make use of some of the same wastewater and water facilities and many of the same schools, recreation facilities, and community facilities.

Abutting Sandy Lake Study Area

Papermill Lake

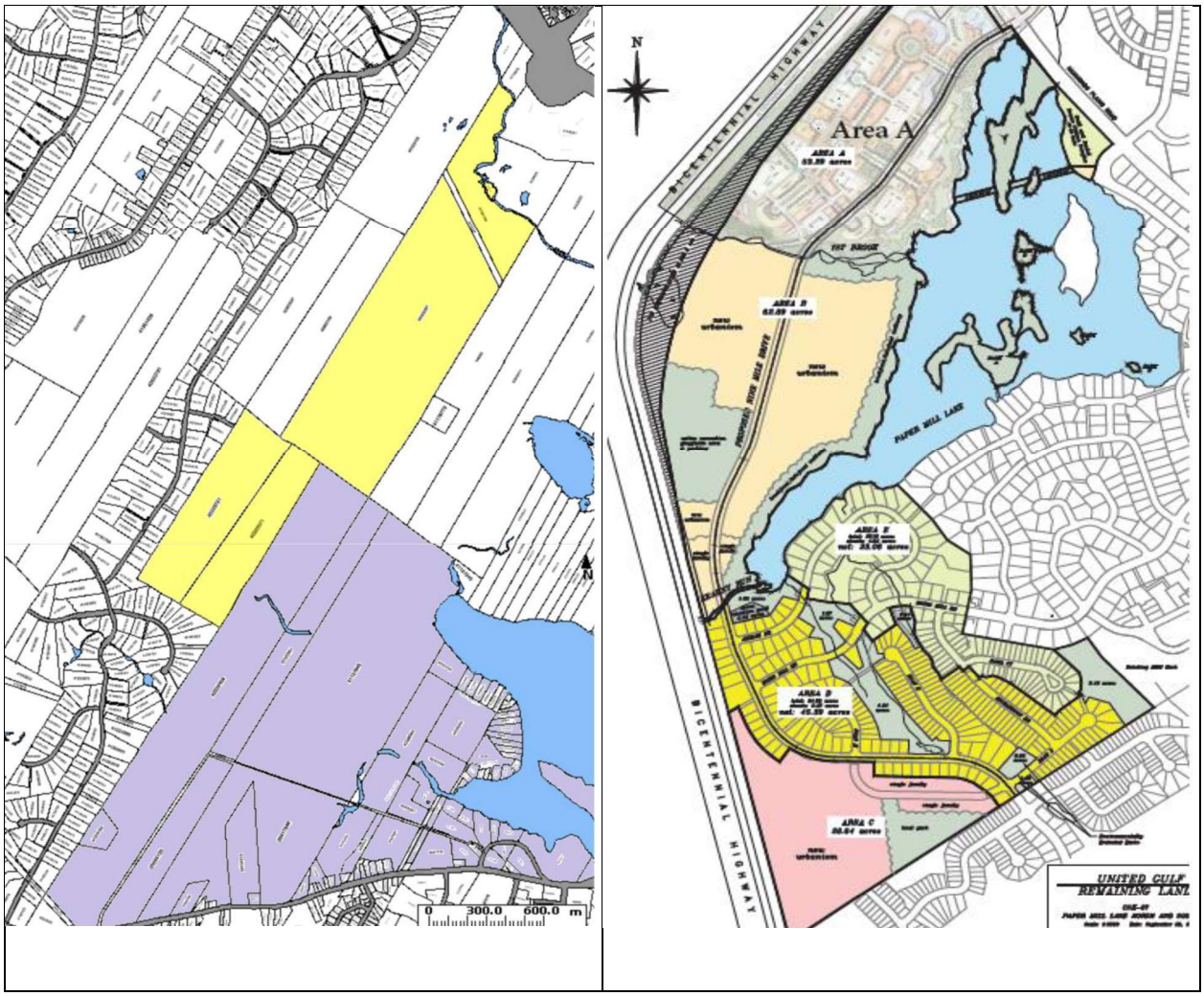

Figure 2.5 United Gulf Land Near Sandy Lake and United Gulf Plan for Papermill Lake

(Source: United Gulf Developments)

2.2 Development Proposals

2.2.1 Clayton Developments Concept Plan

Clayton Developments is a well-established private developer with residential projects throughout Atlantic Canada. The large parcel of land within the Study Area is one of several holdings the company is

proposing to develop in HRM. The company also owns most of the land in the Morris Lake Study Area that is a subject of assessment by the Future Serviced Communities project.

Clayton's proposal for their 670-acre holding at Sandy Lake incorporates a mixture of residential and commercial development (**Figure 2.6**). Their concept plan includes housing types ranging from single-detached homes to high-rise apartment structures. Apartments account for 85.5% of all proposed dwelling units based on Stantec calculations developed from Clayton numbers.

Clayton only provided population for residential development in commercial areas so we assumed units in mixed residential commercial buildings would be apartments accommodating the same number of residents as other apartments provided in the concept plan (i.e., 2.25 residents per unit) and divided that figure into Clayton's population estimate. Remaining units will be ground-oriented types including single-detached homes, semis, and townhouses in row and cluster arrangements. Proposed apartment structures range from four to 20 storeys according to Clayton's summary.

The plan includes a property set aside for a school. If the land is not taken for a school, Clayton proposes to develop 12-storey apartment buildings accommodating 600 additional units on the property. If the land is used for a school Clayton's summary of their proposed development indicates it will also accommodate 50 residents in undefined housing types. Based on occupancy estimates derived from other areas of their concept plan, 50 people would require either 15 ground-based units or 22 apartments. Overall, the concept as depicted in Clayton's plan will incorporate a maximum of 7,631 dwelling units of all types expected to be occupied by 18,392 people, if the proposed school site is developed for residential purposes rather than a school. If it is taken for a school, dwelling units will total between 7,046 and 7,053 with an expected population of 17,842.

Table 2-1 Summary of Clayton Proposed Land Uses

Type	Ground Based Units	Residential Apartments	Apartments in Commercial	School Site (if developed)	TOTALS
Units	1,111	5,596	324	600	**7,631**
% of Total Units	14.5%	73.3%	4.3%	7.9%	**100.0%**
Residents	3,722	12,591	729	1,350	**18,392**
% of Residents	20.2%	68.5%	4.0%	7.3%	**100.0%**
Residents/Unit	3.35	2.25	2.25	2.25	**2.41**

Proposed access to the site is arranged from a crescent roadway off Hammonds Plains Road. Properties accessing the crescent are designated as multi-residential, although substantial area is also devoted to open space, notably including reserved lands on either side of Johnson Brook, which runs immediately north of properties on the roadway. The crescent is connected to a much larger loop that collects traffic from northwest sections of the site and joins to the proposed Bluewater Road Extension after it crosses the Agropur property.

The larger loop collects traffic from multiple local roads. The local roads mostly access neighbourhoods comprised of ground-oriented units (i.e., singles, semis, and townhouses) but also from several high-

density areas and a commercial centre. The largest area of high-density residential uses flanks the watercourse buffer intended to protect Bob's Brook. The proposed mixed commercial node straddles the eastern leg of the loop between Bob's Brook and Johnson Brook. A proposed school site lies across the road from the mixed commercial area.

A further loop in the northeast corner of the site accesses additional ground-oriented units. The neighbourhood served by this final loop is surrounded by lands Clayton is offering to sell to HRM for expected parkland development. The proposed park contains wetlands and reserved lands bordering an unnamed stream that empties into the northwest corner of Sandy Lake, as well as the lake's northeast shoreline. It will abut the HRM-owned properties acquired from Armco for development of the Sandy Lake Regional Park.

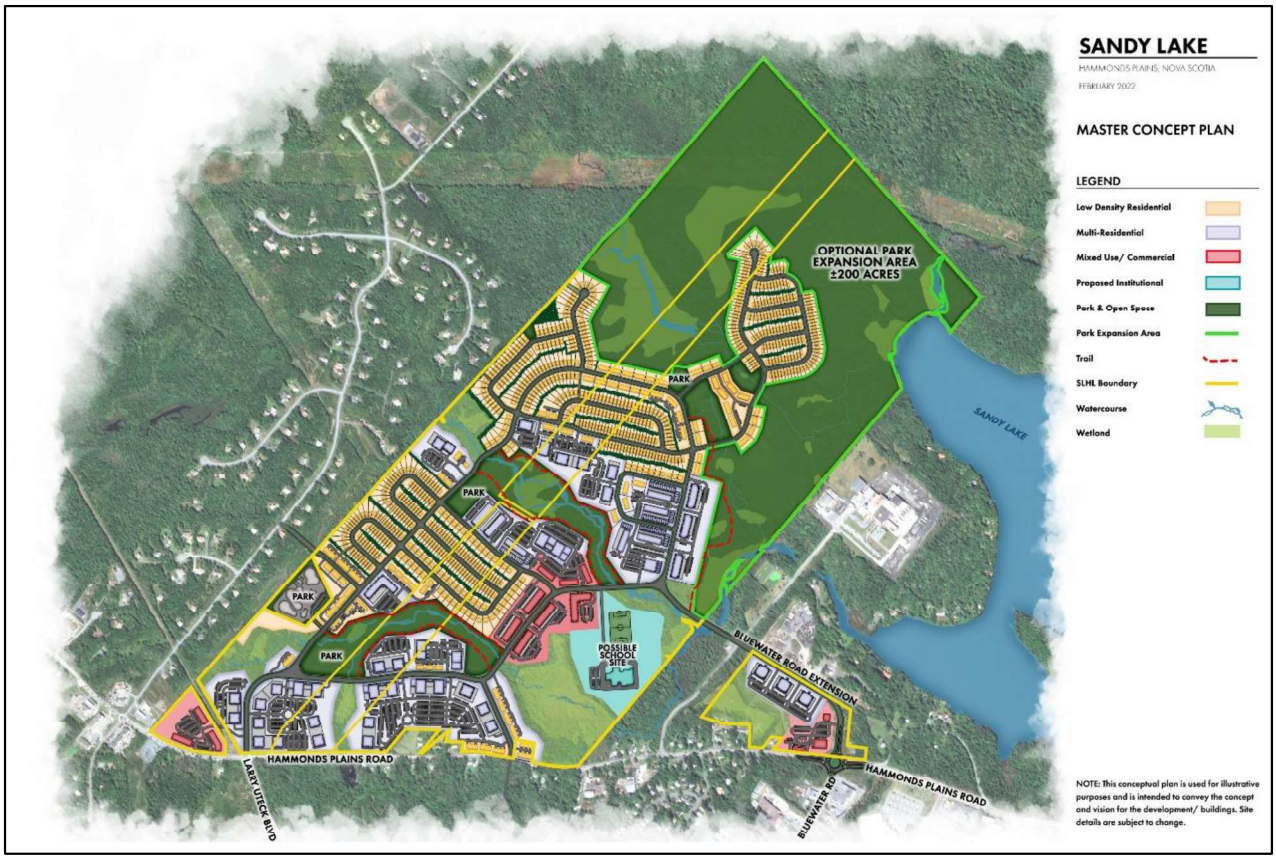

Figure 2.6 Clayton Developments Concept Plan

The final component of the development concept deals with lands on Hammonds Plains Road abutting the eastern edge of the Agropur property. The area is joined to the main development via the proposed Bluewater Road Extension, which crosses the Agropur land, although it does not appear that Agropur supports the idea, which will bring traffic across their property that may impede vehicles accessing the plant. Clayton's plan calls for three multi-unit apartment structures on the north side of the extension where it enters the dairy plant land and commercial development on the west side of the proposed roundabout at the intersection of Bluewater Road and Hammonds Plains Road.

Connection to Bluewater Road is not essential to development of the Clayton plan. The road network provided for the larger western area covered by the Clayton concept plan provides two connections to Hammonds Plains Road. The roadway serving the smaller area east of Farmers Dairy Lane will likely have to be modified but a cul-de-sac or crescent appears to be feasible.

2.2.2 Arsenal Developments Ltd. and Nabil Ahli

In 2023, Arsenal Developments and Nabil Ahli submitted plans to develop lands south of Sandy Lake at 25 Giles Drive and 87 Giles Drive summarized as follows:

25 Giles Drive - This vacant 15-acre property has frontage on both Hammonds Plains Road and Giles Drive. The north edge of the property is on the shore of Sandy Lake while the southern edge faces several light industrial and commercial properties opposite it on Hammonds Plains Road. The Sandy Lake Academy property abuts the eastern boundary. Residential subdivisions are located to the east of Sandy Lake Academy and southwest of the site.

Arsenal proposes to develop a new crescent road from Hammonds Plains Road to Giles Drive as well as a cul-de-sac reaching lands in the northwest corner of their property. The plan incorporates “single unit, low-rise multi-unit and/or townhouse building typologies.” While a letter outlining the proposal prepared by zzap on behalf of Arsenal does not specify the number of dwelling units, the zzap plan **(Figure 2.7**) for the property shows 45 lots, two of which are to be multi-unit buildings. Labels on the multi-unit buildings indicate each would have a 15,000-square foot footprint.

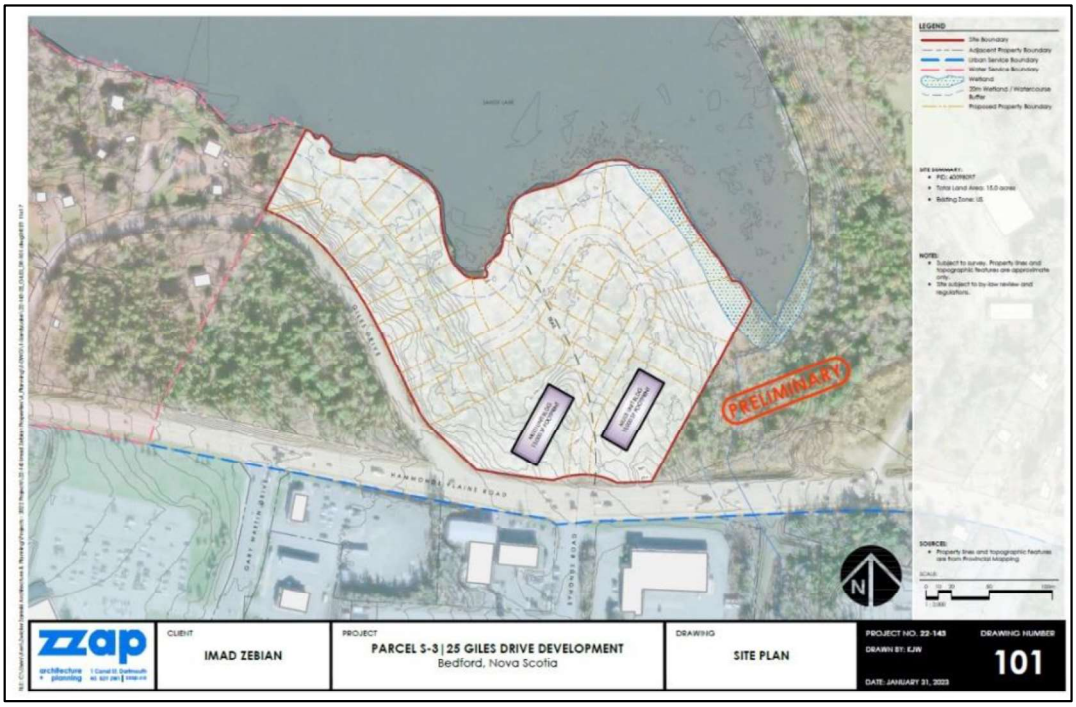

Figure 2.7 Concept Plan, 25 Giles Drive

87 Giles Drive - This 3.2-acre property fronts on Giles Drive and backs onto Sandy Lake. There is currently one single-detached dwelling on the site. Large low-density residential lots surround the property.

The plan submitted by zzap for the property **Figure 2.8** shows a single cul-de-sac accessed from Giles Drive. The plan shows 12 lots with frontage on the cul-de-sac based on the RSU (Single Dwelling Unit) Zone contained in the Bedford LUB. zzap's covering letter states that the cul-de-sac "complies with the maximum length specified in subsection 2.2.1(f) of the HRM Municipal Design Guidelines 2021."

The two development plans will provide 55 lots for single-detached dwellings, although the existing home at 87 Giles Drive would be demolished. Stantec assumes each of the multi-unit buildings at 25 Giles Drive would provide 64 units. In total, the two subdivisions should accommodate a net 119 units, with an estimated additional population of 325.

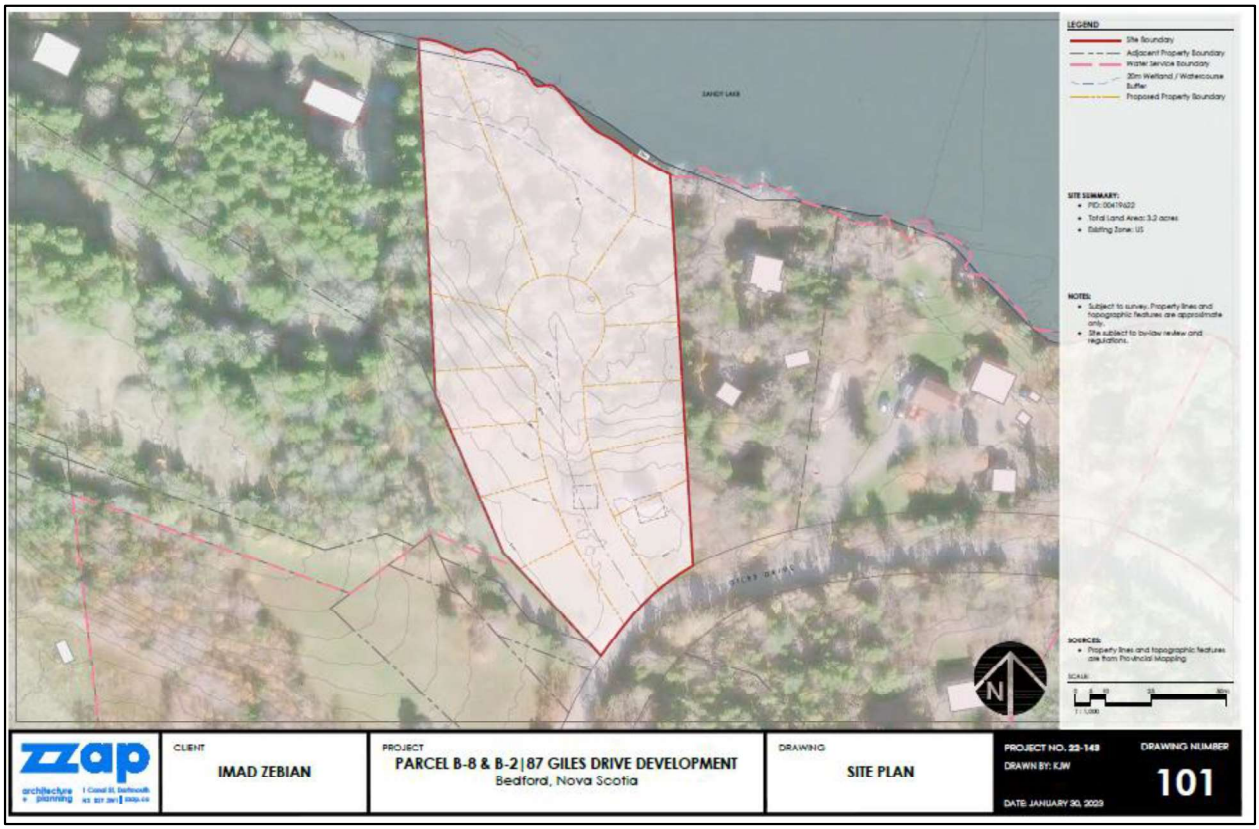

Figure 2.8 Concept Plan, 87 Giles Drive

2.2.3 Other Proposals

Landowners with property in front of the Clayton lands generally indicated they were willing to sell to Clayton for a reasonable price. Clayton has approached some, but they have not reached an agreement. Other landowners want to move a contracting business to a new location in the area and build a 15-storey, 300-unit apartment building with ground floor commercial at 593 Hammonds Plains Road. The

landowner in the latter case, Gino Nadalini, asked Stantec if he could provide a concept, but we suggested he wait because his description of their intentions is sufficient for our current requirements.

2.3 Development Scenarios

The RFP for this assignment specified that the consultant would assess the Study Area in terms of three scenarios described as follows:

- **Low-Density Scenario**: Based on the analysis outlined in Appendix A (of the RFP), the amount of development needed to avoid costly infrastructure or environmental tipping points that also supports the function of a multimodal transportation system to/from and within the proposed community.
- Developer Requested Density Scenario: 6,000 dwellings units.
- **High-Density Scenario**: Based on the analysis outlined in Appendix A (of the RFP), the maximum amount of development that can be accommodated within the lands identified as being suitable for development from an ecological and cultural perspective that respects HRM's goal of creating complete communities, that are connected by efficient multimodal transportation networks and manage impacts on transportation connections outside of the Study Area.

The scenarios have departed from the RFP specifications based on information gathered and available at the time of preparing this Development Scenarios Report. Most notably, developer proposals for the Study Area determined through interviews exceed 6,000 dwelling units

Using the initial findings of the background review and updates to previous studies, Stantec has evaluated and identified three development possibilities for the Study Area. The scenarios consider the following criteria:

- Environmental considerations,
- Capacity to create mixed use development comprising of residential and commercial uses,
- Creating a complete community following the principles of a walkable and transit-oriented neighbourhood,
- Provision of employment opportunities through incorporation of commercial and office space compatible with residential uses, and
- Inclusion of leisure, cultural, and recreational benefits essential for a wholesome lifestyle.

For each Study Area, Stantec prepared three conceptual development scenarios to estimate the potential developed land area and resulting population and non-residential gross floor area. This is used as background information to the various analyses of infrastructure servicing, water quality and transportation impacts. These Development Scenarios should not be considered as a land use plan for any of the Study Areas. HRM will also undertake further planning assessment as part of future development approvals for lands within each Study Area, if directed to proceed with secondary planning by the Province/Regional Council. The methodology for creating the Development Scenarios is explained in Volume 1.

The three scenarios that are discussed are:

1. **Developer Requested Density Scenario –** This scenario explores the proposed intentions of developers that own lands within the Study Area. As discussed throughout the report, Clayton Developments owns most of the lands west of Sandy Lake. Other developers, such as Arsenal to the east, have communicated their intentions to develop land to accommodate residential and commercial/office uses. The section will also reference intentions of individual landowners within the Study Area. A detailed review is provided in Section 2.3.1.

2. **Low-Density Scenario –** A Low-Density scenario will consider a conservative approach to development, proposing to reduce the density proposed by developers to understand the contrast. This approach will utilize the current low and medium-low-density housing typologies such as single detached dwellings, townhouses, and low-rise apartments. A detailed review is provided in Section 2.3.2.

3. **High-Density Scenario –** Higher densities described in section 2.3.3, represent the maximum amount of development that can be accommodated within the lands identified as being suitable for development from an ecological and cultural perspective. This scenario respects HRM's goal of creating complete communities, which are connected by efficient multimodal transportation systems and manage impacts on transportation connections outside of the Study Area. The intent of the high-density scenario is to test, where possible, if higher densities cause unresolvable problems with the water, sanitary servicing, or transportation infrastructure.

4. In the Water Quality analysis only, a fourth "**areal**" development scenario was created as a sensitivity test to assess water quality impacts from a smaller built-up land area. This scenario was developed by reducing the footprint of the developed area by twenty percent, leaving the anticipated population the same as the High-Density scenario. The intent of this scenario is to model a new community built more compactly, and leaving more land in an undeveloped/vegetated condition.

2.3.1 Developer Requested Density Scenario

The primary developer responsible for the "Developer Requested Density Scenario" is Clayton Developments. They have estimated the dwelling units created by their concept plan at just over 7,000 units, as outlined above. In addition, Stantec's consultation of additional property owners has revealed plans for 119 units in two subdivisions that now appear to be owned by the Clayton-affiliated company Sandy Lake Developments as well as 300 units in a 15-storey apartment structure proposed by Gino Nadalini. Together, all proposed residential developments within the Study Area total 8,050 dwelling units with an estimated population of 15,423 in a mixture of housing types as summarized in **Table 2.2.**

Clayton has devoted 14.6 acres to commercial development. Assuming a 40% requirement for roads and related infrastructure, the remaining 8.8 acres or roughly 385,000 square feet would be available for accommodation of commercial structures and related parking and loading areas. Further, assuming 40% building coverage, the gross floor area would be approximately 165,000 square feet, which we would

expect to consist of local commercial uses and business offices. The total commercial complement within the Study Area would therefore be 170,000 of gross leasable area (GLA) or 11 square feet per resident.

Table 2-2 Summary of the Proposed Development, Developer Requested Scenario

	Land Area (ac.)		Dwelling Units				Estimated Population		Commercial GLA (sq. ft.)	
Developer	**Total**	**Developable**	**Unit Type**	**Unit Numbers**	**Density**	**Share by Type**	**Residents**	**Density**	**Per Resident**	**Total Area**
Clayton Developments	670	459.6	Ground-based	1,111		14.6%	2,889			
			Commercial	324		4.2%	583			
			Multi-unit	5,596		73.3%	10,073			
			School Site	600		7.9%	1,080			
			All types	**7,631**	**16.6**	**100.0%**	**14,625**	**31.8**	**11.0**	**165,000**
Arsenal Developments	15	10.3	Singles	43		40.2%	112			
			Multi-unit	64		59.8%	115			
			All types	**107**	**10.4**	**100.0%**	**227**	**22.1**	**11.0**	**5,000**
Imad Zebian	3.2	2.2	Singles	12	5.5	100.0%	31	14.2		
Gino Nadalini	2.6	1.8	Multi-unit	300	**168.2**	100.0%	540	302.8		
STUDY AREA	**691**	**473.9**	**All development**	**8,050**	**17**		**15,423**	**32.5**	**11.0**	**170,000**

2.3.2 Low-Density Scenario

The assumed density of 25 persons per acre based on blending settlement patterns D (Urban Low-Density) and E (Suburban Mid Density) from the 2005 HRM document *Settlement Pattern and Form with Service Cost Analysis* also known as the Pattern Book. This density is as low as we would expect to be contemplated for fully serviced mixed use development. The pattern and density of residential density assumed is similar to currently developed areas of Bedford West that provide a mix of detached housing and apartments such as Stonington Park, immediately to the south of Sandy Lake, and areas of Clayton Park West flanking Parkland Drive. Applying the ratio of 11 square feet of gross leasable area per person inferred from Clayton's concept plan, the commercial space expected to complement the development is roughly 110,000 square feet. In any case, the total of 4,923 dwelling units results in an approximate population of 9,478 people as estimated by Stantec. .

Table 2-3 Summary of the Proposed Development, Low-Density Scenario

	Land Area (ac.)		Dwelling Units				Estimated Population		Commercial GLA (sq. ft.)	
Developer	**Total**	**Developable**	**Unit Type**	**Unit Numbers**	**Density**	**Share by Type**	**Residents**	**Density**	**Per Resident**	**Total Area**
Clayton Developments	670	459.6	Singles	616		12.8%	1,602			
			Townhouses	84		1.8%	218			
			Multi-unit	4,096		85.4%	7,372			
			All types	**4,796**	**13.0**	**100.0%**	**9,192**	**25.0**	**11.0**	**105,000**
Arsenal Developments	15	10.3	Ground-based	39		40.2%	101			
			Multi-unit	58		59.8%	105			
			All types	**97**	**11.8**	**100.0%**	**206**	**25.0**	**11.0**	**5,000**
Imad Zebian	3.2	2.2	Singles	17	9.6	100.0%	44	25.0		
Gino Nadalini	2.6	1.8	Ground-based	14	9.6	100.0%	36	25.0		
STUDY AREA	**691**	**473.9**	**All development**	**4,923**	**13.0**		**9,478**	**25.0**	**11.0**	**105,000**

2.3.3 High-Density Scenario

The assumed density of 45 persons per acre is based on settlement patterns G (Urban High-Density) from the 2005 HRM Pattern Book and is as high as we would expect to be contemplated for fully serviced mixed use development. Applying the ratio of 11 square feet of gross leasable area per person inferred from Clayton's concept plan, the commercial space expected to complement the development is roughly 235,000 square feet. Stantec estimates a total of 11,147 dwelling units with a population of 21,325.

Table 2-4 Summary of the Proposed Development, High-Density Scenario

Sandy Lake - High Density

	Land Area (ac.)		Dwelling Units				Estimated Population		Commercial GLA (sq. ft.)	
Developer	**Total**	**Developable**	**Unit Type**	**Unit Numbers**	**Density**	**Share by Type**	**Residents**	**Density**	**Per Resident**	**Total Area**
Clayton Developments	670	459.6	Singles	1,386		12.8%	3,604			
			Townhouses	189		1.8%	491			
			Multi-unit	9,216		85.4%	16,588			
			All types	**10,791**	**23.5**	**100%**	**20,683**	**45.0**	**11.0**	**230,000**
Arsenal Developments	15	10.3	Multi-unit	257	25.0	100.0%	463	45.0	11.0	5,000
Imad Zebian	3.2	2.2	Multi-unit	55	25.0	100.0%	99	45.0		
Gino Nadalini	2.6	1.8	Multi-unit	45	25.0	100.0%	80	45.0		
STUDY AREA	**691**	**473.9**	**All development**	**11,147**	**23.5**		**21,325**	**45.0**	**11.0**	**235,000**

2.4 Cumulative Effects

The proposed development at Sandy Lake is similar to completed and developing phases of the Bedford South and Bedford West areas. Development is continuing at a high pace within the area along with notable infrastructure improvements (e.g., a new high school on Broad Street and current upgrading of Larry Uteck Boulevard in the same area of West Bedford). The impact of development within the Study Area will overlap with continuing development in the surrounding area, including potential off-site communities such as United Gulf's proposal for Papermill Lake and potential development in the Highway 102 Corridor Study Area that is also a subject of this Future Serviced Communities Study.

3.0 SUMMARY OF KEY FINDINGS FROM THE BACKGROUND STUDIES

3.1 Sandy Lake Land Suitability Analysis

The land suitability analysis (LSA) for the Study Area involved both desktop and field evaluations, supplemented by regional and local studies provided by other organizations. The desktop review included data from various sources such as the Atlantic Canada Conservation Data Centre, Nova Scotia Department of Natural Resources and Renewables, and HRM. Despite valuable information from these studies, additional desktop and field work was necessary to fill gaps, particularly in wetland functional assessments and forest inventory. Field surveys were conducted from spring to fall 2023 to gather further environmental data and assess cultural significance through an Archaeological Resource Impact Assessment. Final analysis covered wetland habitat, watercourses, water quality, forest habitat, species at risk, landscape connectivity, geology, and topography. Suitability for development was ranked from low (1) to high (3), with lower scores indicating higher ecological function and suitability for conservation and higher scores indicating relatively higher suitability for development. The study also identifies potential contaminated sites and areas with elevated archeological potential recommending further investigations to manage risks prior to development. The full LSA report can be found in **Appendix 2A**.

Wetland habitat was a significant focus, with 24 wetlands identified. Thirteen of these wetlands were evaluated using the Wetland Ecosystem Services Protocol – Atlantic Canada (WESP-AC) method. The analysis revealed that most wetlands scored high for ecological condition and wetland risk, indicating their importance for conservation. Stantec recommends that planners and developers engage with Nova Scotia Environment and Climate Change as early as possible to discuss potential wetland impacts (direct or indirect), the permitting process, and compensation requirements (e.g., potential opportunities for wetland restoration, enhancement, or creation). Full analysis of wetland desktop and field data can be found in Section 3.2 in **Appendix 2A**.

The analysis of watercourses and water quality identified nine mapped watercourses and several topographic features that may contain water. The Study Area is located within the Sackville River

Watershed, with Sandy Lake being a central feature. Water quality sampling indicated generally low levels of contaminants, although occasional high bacteria levels were noted. The study highlights the importance of protecting riparian zones and maintaining buffer zones around watercourses to preserve aquatic habitats and water quality. Areas located within 30 m of a watercourse were considered to have low suitability for development. Areas between 30 m and 100 m from a watercourse were considered to have moderate suitability for development, while areas greater than 100 m from a watercourse were considered to have higher suitability for development. Prior to the development of lands within the Study Area, it is recommended that dedicated fish habitat assessments be conducted to determine the use of habitats by fish and to provide data to fulfill applicable regulatory requirements at the time of any potential construction. Full analysis and study details of watercourses and water quality can be found in Section 3.2 of the LSA report in **Appendix 2A**.

Forest habitats and species at risk were assessed using the Nova Scotia Forest Ecosystem Classification system and data from the Atlantic Canada Conservation Data Centre. The study identified several forest types typically associated with habitats for species at risk, including mature and potential old-growth forests. The analysis underscores the ecological value of these habitats and the need for careful planning to balance proposed development with conservation. Forest habitat and species at risk are the focus of Section 3.4 in the LSA in **Appendix 2A**. The report also addresses landscape connectivity, proposing wildlife corridors to link habitat patches and facilitate species movement (Section 3.5 **Appendix 2A**).

The Halifax Green Network Plan (HGNP) and the Nova Scotia Crown Share Land Legacy Trust (NSCSLLT) have identified an important north/south wildlife corridor in the Study Area, connecting the Sackville River to the Blue Mountain Birch – Cove Lakes Wilderness Area. This corridor is recommended to be at least 100 meters wide.

Watercourses and wetlands in the Study Area are protected under provincial legislation and are essential for wildlife travel and aquatic species movement. These areas have low land suitability rankings due to their ecological importance.

A wildlife corridor system has been developed, balancing the protection of sensitive habitats with connectivity needs. This includes a north/south corridor along the western margin of the Study Area, consisting of mature forests. Streams flowing into Sandy Lake should be buffered by 30 meters to protect riparian habitats, with wetlands receiving the same buffering.

To facilitate wildlife movement, a second north/south corridor along Sandy Lake's western shore is recommended. Development areas within the Study Area are surrounded by these corridors, and road and utility crossings should use bridges to maintain corridor integrity. The existing transmission line corridor at the northern end of the Study Area may act as a minor barrier to wildlife movement. Staggering brush cutting along this corridor can ensure continuous security cover for wildlife. Overall, these wildlife corridors will help maintain ecological connectivity, protect sensitive habitats, and provide recreational opportunities for adjacent communities. Conservation easements are suggested to protect these lands and their benefits.

Stantec suggests further evaluation and analysis of forested areas to align with the objectives of the final community design. When planning the community layout either through a secondary plan or in a

developer-initiated application, Stantec advises reviewing forest data to identify regions that can serve as effective carbon sinks and wildfire breaks, as well as mitigate stormwater runoff. To further inform design, additional information can be gathered through targeted species at risk surveys and old-growth survey, among other methods.

The LSA report concludes with two summary maps that show the culmination of biological and geological/topographical land suitability analysis. Areas with higher ecological function, shown in red, such as wetlands, mature forests, and potential habitats for species at risk, are generally deemed less suitable for development and more suitable for conservation. Conversely, areas with lower ecological function, shown in green, are considered more suitable for development **(Figure 3.1).** Geological and topographical mapping highlights potential constraints relating to steeper slopes and potential for acid rock drainage **(Figure 3.2).** Lands shown in yellow generally correspond to recommended setbacks and buffers from the sensitive features. The study provides a framework for future planning and decision-making, emphasizing the need for ongoing evaluations and stakeholder engagement to promote sustainable development in the Study Area.

In the LSA, areas marked in red indicate the lowest suitability for development, while yellow areas represent moderate suitability with certain considerations. Green areas are deemed most suitable for development, as they have the least ecological function. It is important to note that follow-up site investigations and environmental permitting during the development planning and approvals process may refine the suitability mapping with more current and specific information.

Section 3.6 and 3.7 consolidate the considerations from the LSA with the considerations of the other background studies to provide integrated recommendations for the Study Area.

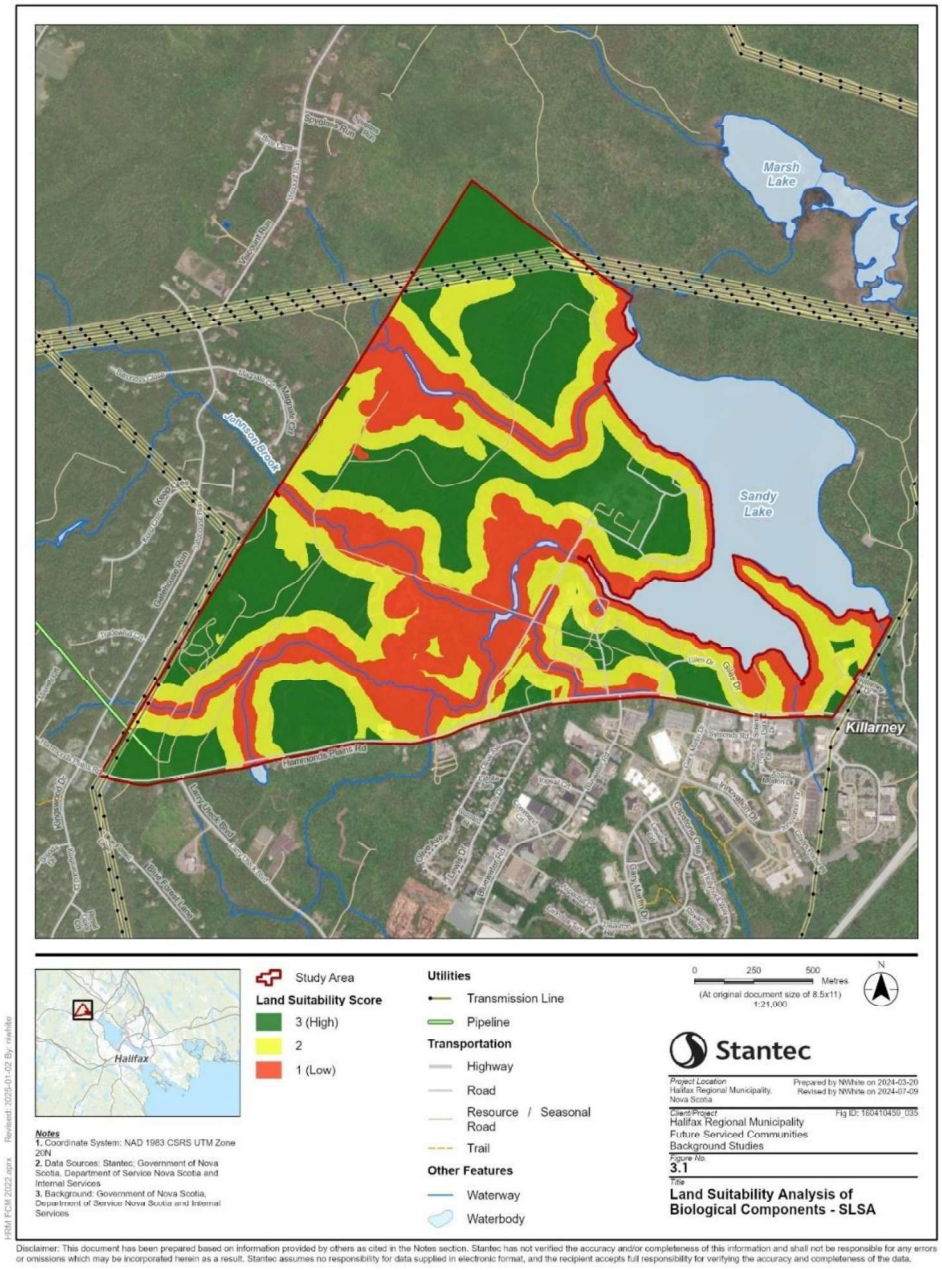

Figure 3.1 Land Suitability Analysis - Biological Components

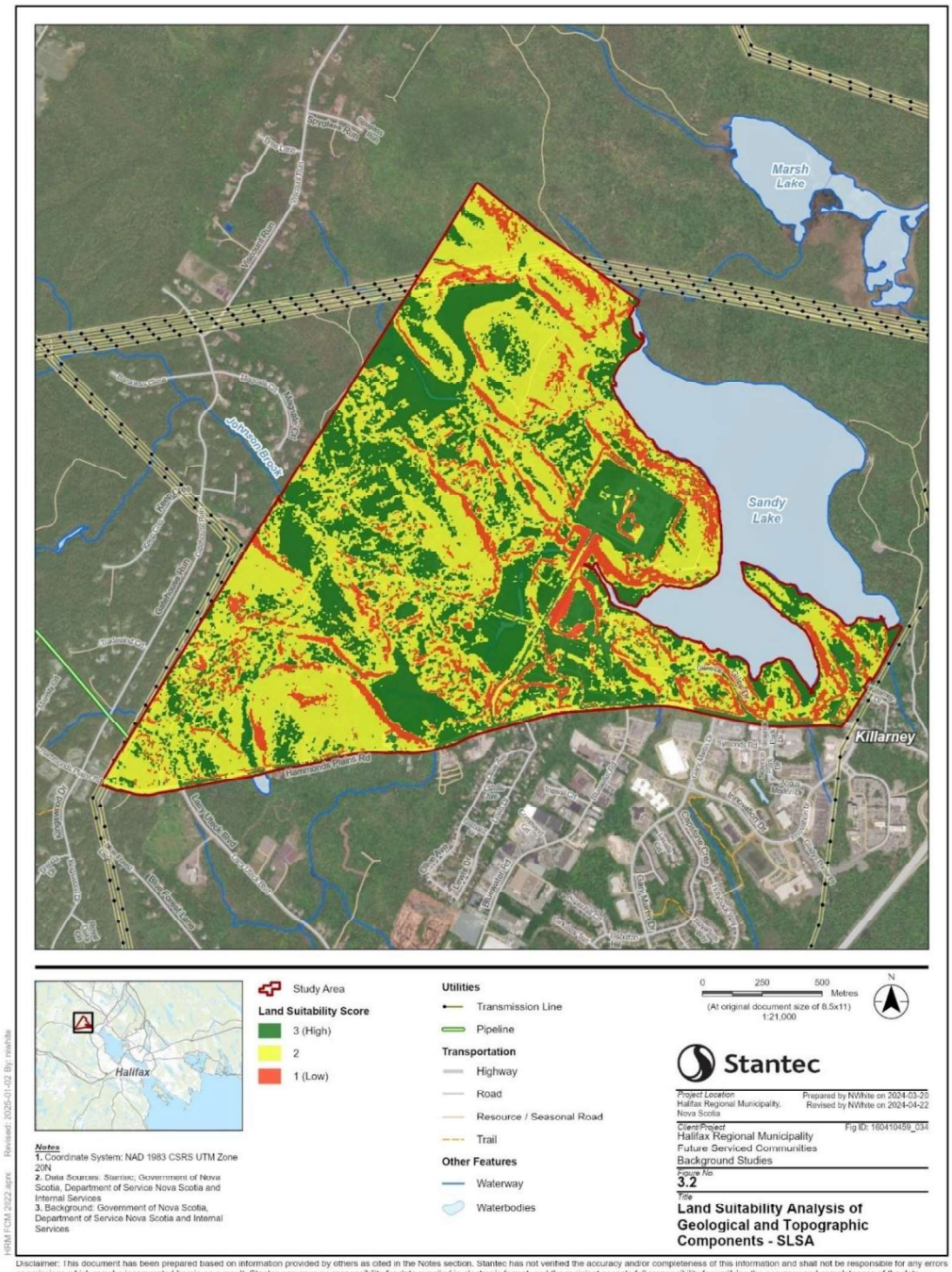

Figure 3.2 Land Suitability Analysis - Geological and Topographic Components

3.2 Sandy Lake Watershed and Stormwater Study

3.2.1 Water Quality Findings

The water quality study focused on three key contaminants: phosphorus, fecal coliform, and sediment, which are known to adversely affect water bodies.

The study analyzed historical water quality data collected from 1980 to 2023, focusing on phosphorus levels, fecal coliform, and total suspended solids. Phosphorus concentrations in Sandy Lake indicate the lake is currently oligotrophic, a natural state for many lakes in Nova Scotia that equates to relatively low biological activity. Urban development will change those levels.

The three previously described development scenarios were evaluated: low-density, developer-requested, and high-density. A fourth "areal" development scenario was created as a sensitivity test to assess water quality impacts from a smaller built-up land area (i.e., a reduced development footprint). Each scenario was modeled to predict changes in contaminant loadings and the resulting impacts on water quality.

- Phosphorus Loading: Stantec estimates that the development scenarios will result in an increase in phosphorus loading to Sandy Lake by 20% to 40%, with the low-density scenario contributing the most significant increase. Phosphorus tends to increase in developed areas as a result of a combination of factors including fertilizers, pet waste, erosion, and organic debris.

- Fecal Coliform: Predicted increases in fecal coliform loadings range from 28.4% to 49.3%, with the areal scenario being the lowest, and the high-density being the highest, primarily due to increased residential and commercial development resulting from human activities (e.g., improper waste disposal and pet waste).

- Sediment Loading: Changes in land use, particularly due to construction and development activities, are expected to increase sediment transport into the lake, potentially degrading water clarity and aquatic habitats.

- From a water quality perspective, the number of people living in the Study Area has less of an impact in comparison to the amount of hard surface coverage created. The amount of land area left in its natural or unurbanized state has a greater impact on water quality than population density. Low density development typically has low lot coverage for buildings and more paved areas per hectare. Medium and high-density development have very high lot coverage for buildings and paved parking areas in comparison.

Full analysis and study details of the Watershed Study are included in **Appendix 2B**.

The Watershed Study outlines a number of approaches to reduce the impacts of new urban development on the water quality in the Study Area. These include:

- Mitigation Strategies: The study provides recommendations to mitigate the impacts of increased contaminant loadings. These include land-use management practices, infrastructure improvements, public education initiatives, and ongoing water quality monitoring.
- Low-Impact Development (LID): Implementation of LID practices is suggested to manage stormwater runoff and reduce pollutant loadings. However, the specific selection, design, and location of these LIDs should be further investigated at any potential future detailed design stage. The assessment should take into account factors such as the infiltration capability of the native soils, the depth to bedrock, the depth to groundwater table, and local regulations. It should also be noted that LID measures that impact the overall drainage plan should be located within the right of way owned by the Municipality, since practices located at the lot level could be modified by property owners impacting the performance of the overall storm drainage plan.
- The study underscores the need for careful planning and implementation of mitigation measures to preserve the water quality of Sandy Lake amid any potential future development. The findings highlight the importance of balancing urban growth with environmental stewardship to ensure the long-term health of the watershed. In any subsequent phases of community planning, careful attention should be taken to clustering development to retain the portion of land remaining as greenspace and provide sufficient buffers from all water features.

3.2.2 Existing Flood Risk Findings

Existing policies and regulations provide direction to limit development in flood risk areas. The Province of Nova Scotia has adopted a Statement of Provincial Interest Regarding Flood Risk Areas. The goal of the statement is to protect public safety and property and to reduce the requirement for flood control works and flood damage restoration in floodplains.

Given that the Study Area is within the Sackville River Watershed, which has experienced significant flooding in the past, the provisions outlined in the Statement of Provincial Interest Regarding Flood Risk Areas should be met.

The Statement of Provincial Interest Regarding Flood Risk Areas outlines that planning documents must identify *Flood Risk Areas* consistent with the Canada-Nova Scotia Flood Damage Reduction Program mapping and any locally known floodplain. For *Flood Risk Areas* that have been mapped under the Canada-Nova Scotia Flood Damage Reduction Program, planning documents must be reasonably consistent with a number of guidelines that explain what is permitted and what is prohibited in floodways and floodway fringe areas. The Statement does permit development contrary to the Statement provisions, provided a hydrotechnical study carried out by a qualified person shows the proposed development will not contribute to upstream or downstream flooding or result in a change to flood water flow patterns.

The MPS and LUB for Bedford contain policies and regulations that limit development in the Sackville River floodplain. These policies and regulations are in the process of being updated based on a recent

floodplain study. While this project does not include floodplain mapping for the Sandy Lake sub-watershed, the updated policies and regulations will provide updated municipal standards that should be considered for the Study Area through future planning reviews.

The water elevation in Sandy Lake significantly influences existing drainage conditions within the Sandy Lake sub-watershed. Preliminary (i.e., subject to change) flood lines were provided by HRM from the on-going Regional Flood Mapping Delineation project and were used to estimate the water levels in Sandy Lake during various return periods and used in the stormwater model as boundary conditions.

Figure 3.3 illustrates the existing conditions with the preliminary floodplain extents for the 20-year and 100-year flood lines including climate change impacts.

The northwestern portion of the Study Area on the lands primarily owned by Clayton is transected by two watercourses: Johnsons Brook and an unnamed watercourse. As described in the LSA, the watercourses require appropriate setbacks to avoid flood vulnerable areas and for ecological conservation. Significant areas in the southeastern portion of the Study Area along Hammonds Plains Road are also flood vulnerable, and development of new communities, public service facilities, and major infrastructure in this area will be constrained.

The existing condition stormwater model showed that several culverts might be undersized. However, the preliminary flood lines obtained from HRM imply that three of these undersized culverts in particular might be exacerbating the flooding extents in the Hammond Plains area, which has been subject to flooding in the past. These culverts include the culvert crossing Farmers Dairy Lane and the culvert downstream of it, as well as the culvert located at the outfall, also crossing Farmers Dairy Lane. It is recommended that upsizing of these culverts be prioritized to provide adequate conveyance capacity and improve existing drainage conditions prior to further development in the area. However, it is important to note that culvert upgrades will result in peak flow increases and increased flooding risks downstream and as such, it is recommended that further hydraulic analyses be completed at the detailed design stage of these culvert upgrades to assess flooding impacts downstream.

The existing culvert under Hammonds Plains Road, close to Blue Water Road, is also undersized. This culvert, located at the upstream end of the drainage system, has a direct impact on the flooding levels within the downstream Hammonds Plains Road area, and as such, it is recommended that any further culvert upgrades be completed based on further hydrologic/hydraulic analyses taking into account flow monitoring and model calibration to confirm peak flows, culvert sizes, and assess the impacts downstream. It is also recommended to base future revisions to the stormwater management plan on the potential upgrade of the culvert under Hammond Plains Road, which could be deemed necessary to reduce flooding risks upstream of the culvert.

Please refer to **Appendix 2B** for details on the existing condition hydrologic/hydraulic modeling exercise.

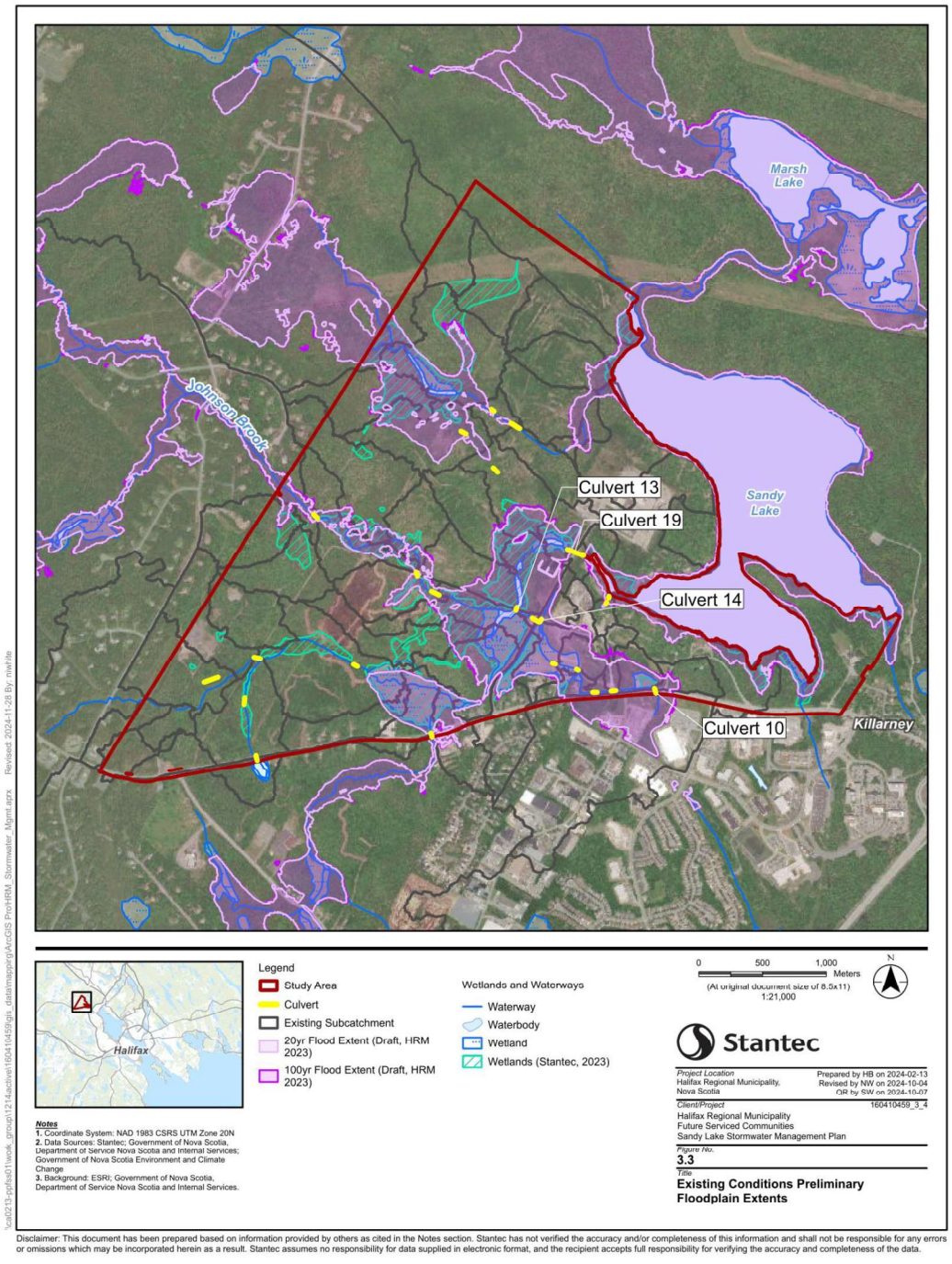

Figure 3.3 Existing Conditions - Preliminary Floodplain Extents

3.2.3 Conceptual Stormwater Management Plan

To assess stormwater management (SWM) measures and best practices, Stantec developed a conceptual grading plan for the Study Area, based on the road and development concept plans provided by the landowners. Note this conceptual grading plan will likely change with any subsequent phases of community planning as the concepts evolve. The developer requested-density development scenario, which results in larger impermeable surfaces, was used for planning, with a focus on maintaining existing drainage patterns and incorporating stormwater management measures. Post development subcatchments were developed based on existing topography, proposed grading, and the high-density concept plan layout. A hydrologic/hydraulic modeling exercise was completed in PCSWMM for different return periods based on estimated boundary conditions from the preliminary HRM flood lines in order to size required storm drainage infrastructure and to outline resulting stormwater management strategies. Please refer to **Appendix 2B** for details on the conceptual SWM plan.

The conceptual SWM plan illustrates conceptual trunk storm sewers at key locations, sized to convey the 5-year storm under free flow conditions. The SWM plan also shows conceptual SWM pond locations and overall drainage areas to the proposed SWM ponds. The final number, location, and size of the SWM dry ponds is to be confirmed based on best engineering principles and detailed floodplain mapping for the area, including flow monitoring and model calibration.

To restrict post-development peak flows to pre-development levels up to the 100-year storm event, eight dry ponds are proposed, located based on existing drainage patterns and the conceptual development plan. In general, it is recommended that the proposed development plans for the Study Area be revised to avoid residential, commercial and institutional land uses within the 100-year floodplain and to ensure that appropriately sized blocks are allocated for the SWM ponds outside of the confirmed 100-year floodplain. Refer to **Figure 3.4**.

Given that Halifax Water currently does not have a mandate for stormwater quality and cannot devote budget for this purpose, quality control of runoff for the Study Area is to be provided by land developers through different techniques as follows:

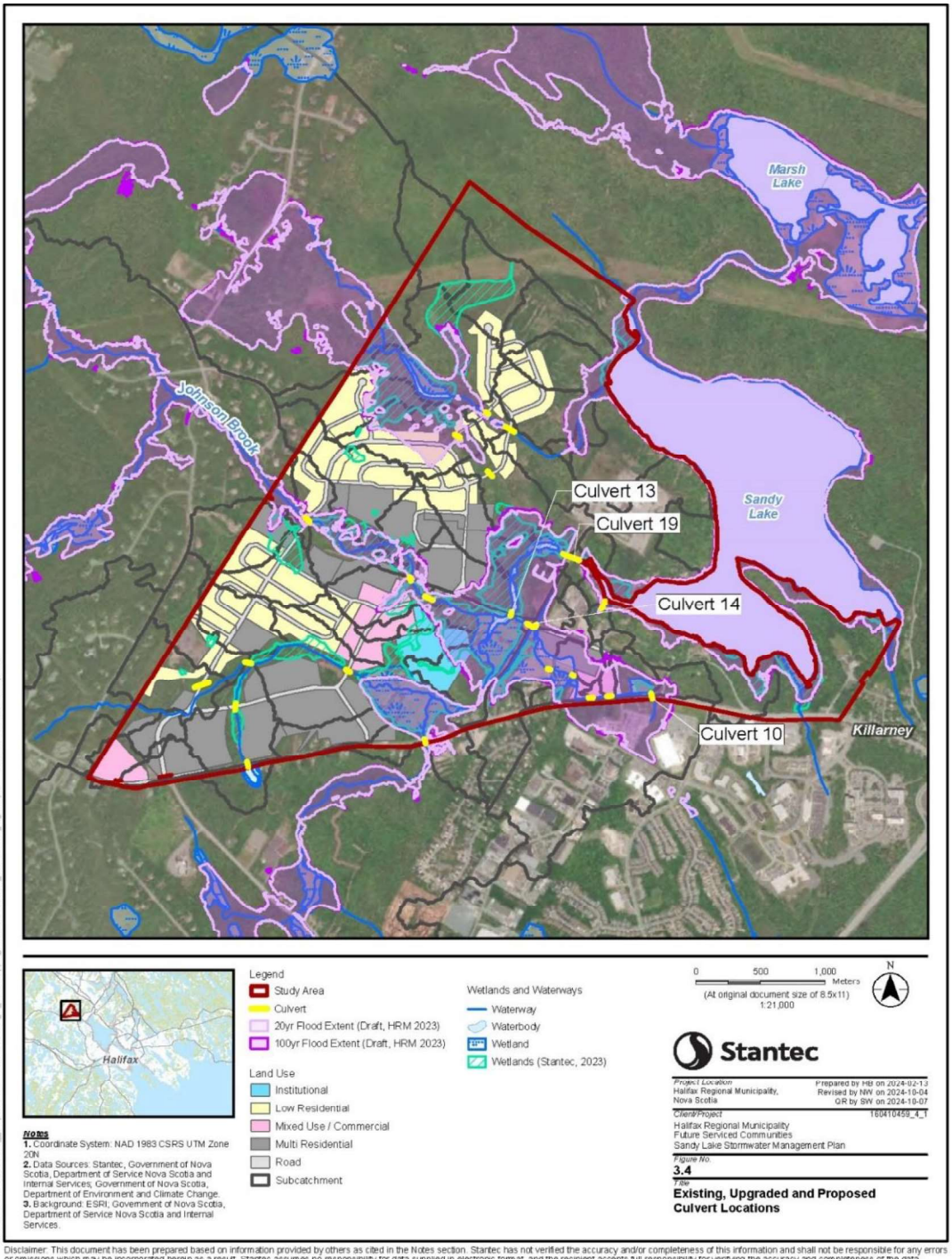

Figure 3.4 Existing, Upgraded and Proposed Culvert Locations

Best Management Practices (BMPs):

- Lot-Level Measures: Directing residential roof runoff to vegetated surfaces and introducing vegetated swales.
- Low Impact Development (LID) Measures: Infiltration trenches, bioswales, and other measures to filter and infiltrate runoff before it reaches watercourses.

Green Infrastructure:

- Vegetated Filter Strips and Swales: Designed to process and reduce runoff from impervious surfaces.
- Native Species Plantings: To absorb stormwater, decrease runoff, enhance water quality, and support biodiversity.

Erosion and Sedimentation Control:

- Implementing measures to prevent sediment from entering watercourses during construction activities.

The following is a summary of recommendations from a SWM perspective should this area be approved for development:

- Flow monitoring in the watercourses and subsequent model calibration should be completed to confirm regulatory floodplain limits, culvert sizing, and proposed pond sizes and location.
- No active development should be permitted within the limits of the 100-year regulatory floodplain. Some reduced risk uses may be considered in agreement with HRM by-laws and the Nova Scotia Statement of Provincial Interest regarding Flood Risk Areas. This is subject to design considerations that effectively mitigate and/or minimize the impact of such development on the floodplain and protect the riparian corridor functions.
- An investigation into Sandy Lake's rain-runoff response and outlet structure should be completed to refine the boundary conditions in the model.
- The development applicants should complete a detailed geotechnical investigation at any future detailed design stage. Geotechnical recommendations should be provided for the proposed SWM ponds, grade-raise restrictions, and the feasibility of LIDs in the area.
- Detailed hydraulic modeling of the watercourses should be completed to better understand flooding risks at the current location of SWM Pond 1 and SWM Pond 2 as the current 100-year flood lines are based on a high-level model and are subject to change. The development applicants should examine a revision of land use distribution to increase high-density uses, reduce the development footprint, and allow the location of the proposed ponds to inform the design of an effective and sustainable stormwater management plan.
- The feasibility of implementing two separate SWM ponds at each side of the watercourse should be investigated during any future design stages to service the current development area tributary to SWM Pond 3 and discussed with Halifax Water. The SWM ponds could potentially be moved

upstream as long as proposed grades and site layout work to ensure sufficient cover over storm sewers.

- The development applicant should examine a revision of land use distribution to increase high-density uses, reduce development footprint, and allow the location of the proposed ponds to inform the design of an effective and sustainable SWM plan.
- The development applicant should revisit the development concept plan to ensure SWM ponds are located outside of the 100-year floodplain and delineated wetlands, to maximize the use of natural areas considering the recommendations of the LSA, to consider high-density land uses that reduce sprawl to achieve this purpose, and to inform the revision of the proposed development layout and stormwater management plan to reduce risk of flooding and degradation to natural assets in the Study Area. The current layout includes SWM ponds located in or close to areas under risks of flooding.
- HRM should restrict development in the vicinity of Hammond Plains Road and Bluewater Road to minimize future flood related impacts. By limiting new construction and structural modifications within this flood-prone area, the potential for property damage and adverse environmental impacts can be reduced, supporting a more sustainable and resilient infrastructure approach. Base future revisions to the SWM plan on the potential upgrade of the culvert under Hammonds Plains Road (Culvert 10). This upgrade may be needed to reduce flooding risks upstream of the culvert.
    - In any future stages of planning and development of the site, the development plan should be revised to relocate residential development and ponds that are currently close to or within the potential floodplain, such as those currently envisioned around Pond 1. By pulling back the development, and potentially adding density to the remaining area, the population/development yield of the site could remain similar, and it could reduce the potential risks associated with flooding. The LSA recommends that areas within 30 m of a watercourse have low suitability for development, so setback areas from watercourses must be studied on a site-specific basis during any subsequent area planning to determine suitability.
- Retaining native and existing ground cover should be prioritized where possible to preserve ecosystem service function (i.e., support biodiversity), reduce volume of runoff discharged into watercourses, promote infiltration, and provide an opportunity for evapotranspiration.
    - Start future development phasing in higher areas outside of the identified preliminary floodplain and complete detailed floodplain mapping to confirm floodplain extents and development setbacks as future developments move closer to the identified preliminary floodplain. High density land uses potentially reduce the footprint of development and help to maintain development and stormwater management infrastructure away from flooding risk areas. Therefore, a revision of the proposed development layout is required to improve the effectiveness and safety of the proposed SWM plan.
    - Implement structural LID measures within public property to reduce contaminant loads for the development area to achieve contaminant loads of existing conditions.
    - Implement erosion and sedimentation control measures to mitigate effects from development during construction, as well as implementing construction sequencing to minimize the quantity of soil exposed at any given time to prevent erosion.

3.3 Sandy Lake Water Servicing Plan

The Sandy Lake Development Servicing Scenario (**Appendix 2C**) outlines the review of the potable water servicing within the Study Area and summarizes the conceptual water servicing plan required to meet Halifax Water's established level of service and design criteria.

The proposed development concepts consist of a combination of residential dwelling types and commercial buildings. Two of the three development scenarios were assessed to estimate high- and low-density population projections to identify servicing constraints at either population density extreme. These scenarios were used to estimate average day demand, maximum day demand, minimum hour, and peak hour demands for the development based on per capita usage rates and peaking factors from Halifax Water's *Design Specifications and Supplementary Standard Specifications for Water, Wastewater & Stormwater Systems*, 2023 Edition. The demands were then used to assess the requirements for servicing the proposed development with potable water from Halifax Water's existing water system network.

A review of the adjacent pressure zones and proposed site grading suggests the proposed development can be serviced with potable water from the existing Bluewater Intermediate and West Bedford Intermediate pressure zones. Proposed pressure zone re-delineation is outlined in the **Figure 3.4**.

A water system model was developed using InfoWater Pro to estimate the development distribution system requirements to achieve the level of service set out in Halifax Water's Design Specification. The model development assumes that the connection to each existing pressure zone is a constant Hydraulic Grade Line (HGL) with unlimited flow (i.e., the connections are modelled as fixed head reservoirs). This assumption does not reflect the actual system, however, in the absence of a full system model it is a reasonable assumption. The proposed watermain sizes range from 200 mm to 400 mm diameter, with the majority being 200 mm diameter.

The water model results indicate the following for both the high-density and low-density population scenarios:

Table 3-1 Water Modelling Results

Flow Scenario	Pressure Range (psi)	Max Velocity (m/s)	Available Fire Flow (Lpm)
MDD High Density	51 – 98	< 1.5	N/A
PHD High Density	48 – 97	< 1.5	N/A
MHD High Density	52 – 92	< 1.5	N/A
MDD + FF High Density	> 22	< 2.4	4,500 – 27,500*
MDD Low Density	52 – 99	< 1.5	N/A
PHD Low Density	52 – 99	< 1.5	N/A
MHD Low Density	52 – 99	< 1.5	N/A
MDD + FF Low Density	> 22	< 2.4	4,500 – 27,900*

- Based on the assumptions of a constant HGL at the connections to the existing pressure zones. Therefore, the values for available fire flow should be considered with a low level of confidence.
- Since the maximum pressures for each scenario exceed the range presented in Halifax Water's Design Specification, pressure reducing valves installed on the water service lines (in accordance with Halifax Water's Supplementary Standard Specifications) should be considered in those locations.

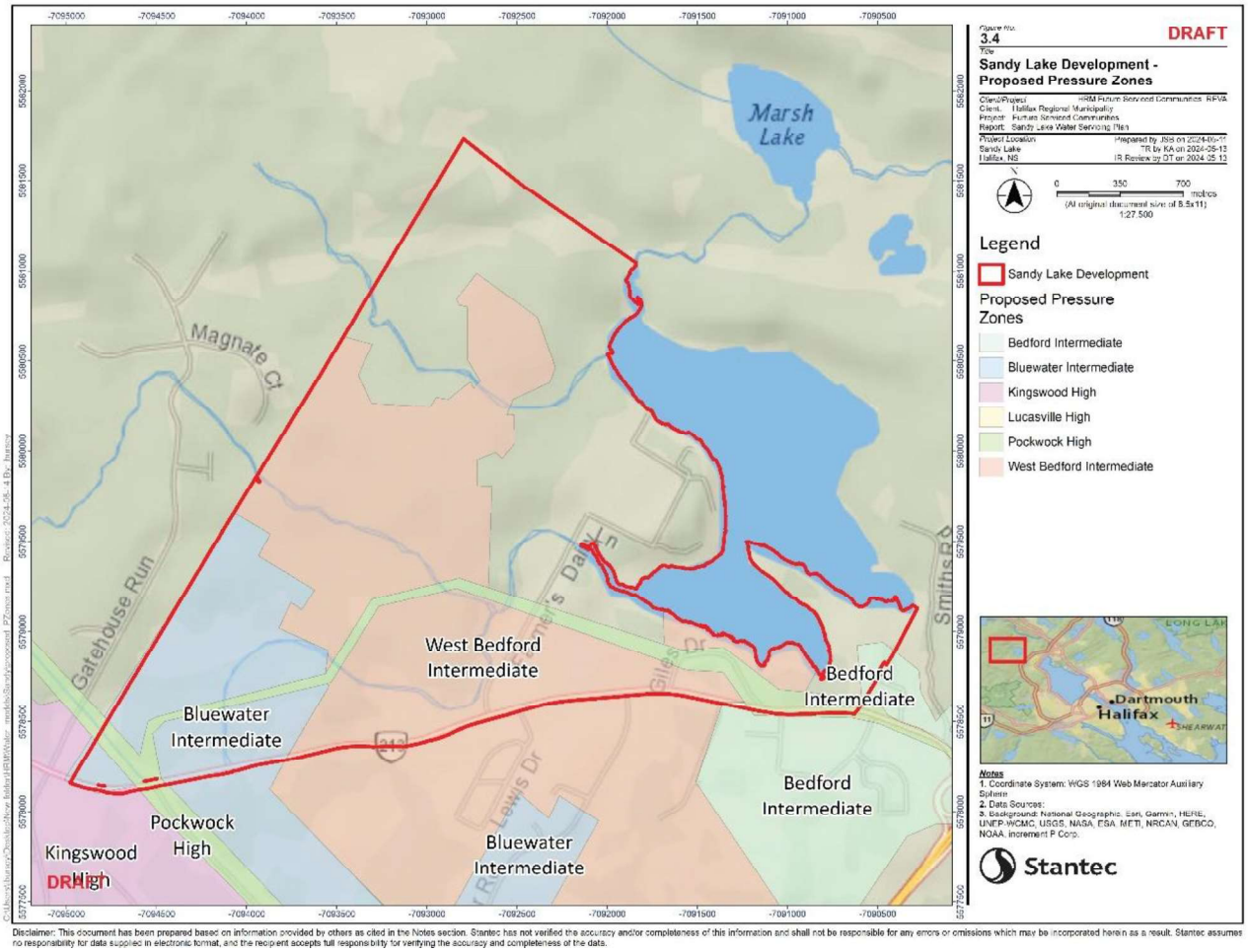

Figure 3.5 Sandy Lake Development – Proposed Pressure Zones

Since the Sandy Lake Development plan is preliminary and subject to change, the maximum day demand, minimum and peak hour demands, and required fire flow demands presented may change resulting in changes to proposed water distribution preliminary design. It is recommended that the level of service and distribution system requirements be reassessed during subsequent design stages.

In the absence of a full system model, the effect of the proposed development on the level of service of the remaining system could not be assessed. Also, the effect of potential restrictions within the existing system on the proposed development could not be assessed. In Halifax Water's 2019 Infrastructure Management Plan (IMP), it was recommended that an all-pipe hydraulic model be developed. An all-pipe model can be used to assess fire flow objectives at each property or node in the system. It is recommended that the proposed development be incorporated in the all-pipe model to perform a more refined fire flow level of service assessment for the development. The impact of this development on the regional water system was outside the scope of the study. Regional impacts are managed by Halifax Water. Halifax Water maintains a full system model and they would ultimately assess the effect of the proposed development on the level of service of the remaining system.

3.4 Sandy Lake Wastewater Considerations

Unlike the other Study Areas in the Future Serviced Communities project, the review of the anticipated wastewater system in the Study Area was excluded from Stantec's scope of work. Halifax Water is evaluating the Study Area for sanitary servicing. Any information provided in this section on sanitary servicing is a synopsis of information provided by Halifax Water and has not been independently verified by Stantec.

The scope of the water and wastewater servicing analysis included in the Future Serviced Communities Study does not include wastewater treatment facilities or water treatment plants. Halifax Water has a well-established strategy for water and wastewater infrastructure planning as it relates to asset renewal, compliance, and growth. The Integrated Resource Plan (IRP) shapes Halifax Water's capital program by identifying resource and finance needs. There are three major plans contained within the IRP, those being the Asset Management Plan, Compliance Plan, and IMP. The IRP aims to provide regional water and wastewater infrastructure needed to support planned growth.

The IMP is a comprehensive infrastructure master plan for both water and wastewater that supports growth. As part of the IRP approach, the plan is updated at regular intervals to ensure the consolidated long-term program remains current. HRM supplies Halifax Water with growth projections to be considered within the IRP, in this case, the Future Serviced Communities Studies: Sandy Lake, Highway 102 Corridor, Morris Lake Expansion, and Westphal will be incorporated into the upcoming review of the latest iteration of the IRP. Growth projections are used as input to analysis, such as water and wastewater models, which aid in determining preferred servicing strategies.

Based on the study by DesignPoint, Bedford West, Sandy Lake, and Jack Lake Wastewater Infrastructure Area Plan (2017), a high-level wastewater servicing plan was prepared, which addressed regional wastewater improvements for the broader area and accommodated the proposed Sandy Lake Development as described in Section 2.3. Clayton provided an updated wastewater concept plan prepared by DesignPoint. The concept wastewater plan contemplates a new Pump Station 1 servicing the proposed Sandy Lake Development and accommodating the existing flows from the Twin City Pump Station. A local pump station servicing rear lands and tributary to the Main Pump Station is also proposed (Refer to the Sanitary Schematic, Design Point). This generally aligns with the previous study by DesignPoint (2017) with some notable differences:

- The Main Pump Station 1 is a new Pump Station located east of the Twin City Pump Station, whereas DesignPoint (2017) proposed Twin City Pump Station to be upgraded.
- The Main Pump Station 1 identifies flows at 213.2 L/s vs. 419 L/s DesignPoint (2017), which appears to be sized for only Sandy Lake (SL1) area and Existing Twin City PS flows (29.7 L/s), and not for a larger area encompassing areas SL1, SL2, BW12, PL1, BW1A, B1, U1, U2 per previous study.
- The i/i allowance of 0.24 l/s/ha was used to calculate i/i loading, which deviates from the DesignPoint (2017) and prescribed Halifax guidelines.

- Forcemain connection is proposed to be connection at the west of the BW12 lands instead of east end along the Hammond Plains Road.
- No narrative has been provided with regards to the downstream infrastructure improvements and upgrades.

The existing wastewater collection system and transmission system for Sandy Lake Lands (SL1 and SL2 sub-sewershed) currently drains to the Mill Cove Wastewater Treatment Facility (MCWWTF) via Farmer's Dairy Pump Station (Twin Cities PS) at a peak flow rate of 29.7 L/s (as referenced in the 2008 CBCL report, DesignPoint, 2017). However, based on the recommendation of the report, the SL1 and SL2 lands would ultimately be re-routed to the Halifax System via Twin Cities Pump Station & Pump Station #1 to Kearney Lake Regional Trunk, with only SL3 lands tributary to MCWWTF. The DesignPoint report estimate of the population for the SL1 and SL2 area, was 17650 and 6290, respectively, which combined exceeds the high-density development scenario for these lands 23,940 (DesignPoint) vs. 21,325 (Stantec, 2024).

It is of note that the developer requested scenario peak sanitary discharge exceeds that demonstrated by DesignPoint within recent (2023) sanitary schematics due to variance in anticipated developable land and differing allowance for infiltration noted on accompanying drawings. The PS flows for the Study Area per a figure provide by Clayton's consultant is 213.2 L/s, whereas we calculated 240L/s and 298L/s for developer requested and high scenario, respectively. The Design Point (2017) completed for Halifax Water (HW). HW contemplated the Study Area and other lands to be going to the upgraded Twin City PS/Main Pump Station 1 at 419L/s, which is different from what they provided to Clayton in 2023. This variance should be corrected by the proponent through the adjustment of developable land and accounting for various land uses and buffers and setbacks, as well as confirmation of the design parameters prescribed for this area with HW during any secondary planning processes and any subsequent permitting processes.

Peak discharge from upgraded Twin Cities pump station is expected to accommodate discharge from the Sandy Lake development area as noted in addition to areas U1, U2, undeveloped portions of SL2, BW12, PL1, B1, and BW1A per the 2017 Infrastructure Area Plan.

As anticipated by the 2023 sanitary schematic, preliminary grading plans identify the potential need for a smaller internal lift station to service lands within the Study Area north of the unknown watercourse crossing at the extension of Granter Road. This low-density residential area would otherwise require local sanitary sewers in excess of 6m in depth when following existing topography of the lands north of Johnson Brook.

Based on the evident deviation from the original study by DesignPoint (2017), it is recommended that the Bedford West, Sandy Lake, and Jack Lake Wastewater Infrastructure Area Plan be updated as part of the Master Servicing Study for the Study Area.

In any subsequent planning steps, it will be essential for landowners to coordinate servicing strategies with the regional infrastructure as noted by Halifax Water and summarized in the detailed Development Servicing Scenario report **(Appendix 2C)**. This needs to be carefully integrated with community design since there are significant interdependencies.

3.5 Sandy Lake Transportation Analysis

The Study Area is primarily served by a pair of two-lane arterial roadways. Hammonds Plains Road travels from east to west and forms the southern boundary of the Study Area. Larry Uteck Boulevard meets Hammonds Plains Road near the southwest corner of the Study Area. Speed limits range from 50 to 70 km/h on each road.

The concept plan for the Clayton Developments – the largest in the Study Area – describes site access as a crescent roadway intersecting Hammonds Plains Road at its current intersection with Larry Uteck Boulevard and at Bluewater Road to the east prior to Farmers Dairy Lane. A proposed extension of Bluewater Road would join a second Clayton-owned parcel with the main development. This extension crosses land currently owned by Agropur, operators of the nearby dairy processing plant. A large collector loop joins the proposed crescent road and Bluewater Road extension while providing access for the majority of uses to be located on the parcel. The larger loop collects traffic from a secondary street network, which provides access to additional low-density residential units in the proposed Clayton plan, in addition to a proposed commercial centre. A further loop in the northeast corner of the site provides access to proposed additional low-density residential units.

As previously described, proposals for two smaller developments along Giles Drive have also been submitted. The proposed Arsenal development proposes a new road joining Hammonds Plains Road and Giles Drive as well as a dead-end street closer to Sandy Lake. The second plan proposes to subdivide the lot at 87 Giles Drive and construct a single street terminating in a cul-de-sac in the north. Concept plans illustrating these proposed roadway configurations can be found in Section 2.2 of this document.

The West Bedford Park and Ride and its associated transit terminal are located roughly one kilometre southeast of the intersection of Hammonds Plains Road and Bluewater Road. Halifax Transit serves the terminal with one express, one rural, and two local routes.

The Clayton Developments' concept proposes multi-use paths along its collector roads that connect to other planned multi-use paths through nearby developments. Proposed multi-use paths along the primary arterials connect the development site to the previously mentioned bicycle facilities east and south of the Study Area. An eastern extension of the path network provides separated facilities along Hammonds Plains Road. The Clayton concept plan proposes additional trails along lands reserved for watercourses that provide alternate routes and through connections between various points on the primary active transportation loops.

Access Audit

The Community and Deprivation Audit Tool (CDAT) is a GIS-based analytical tool to examine public and active transportation connectivity and levels of socioeconomic deprivation. Deprived areas are defined as lacking in a major socioeconomic indicator such as the unemployment rate or higher education achievement. The primary use of the tool is to determine the strength of the relationship between connectivity and levels of deprivation in a municipality or community to inform investment in transportation infrastructure and services. The study of Sandy Lake employs the tool to identify connectivity deficiency for future residents of the proposed development.

CDAT assessed pedestrian and transit access to 14 key service and amenity categories for the entirety of Halifax roughly equivalent to the sum of the Regional Centre and Inner Suburban areas defined in the Integrated Mobility Plan.

A second evaluation scenario solely considers the Study Area and assesses future resident connectivity to health care (hospital, doctor, pharmacy), transportation (public transport, train station), education (primary and higher education), daily needs (supermarket, local shops), leisure (entertainment, park Land, natural space, sports), and places of worship if no other action is taken to diversify land use within the development site.

A third and final evaluation scenario adds new destinations and services to the proposed development area to determine relative connectivity improvements for the proposed new population according to intentional land use decisions. The Study Area was subsequently reassessed with added public transit stops (route undefined), a doctor's office, a pharmacy, local shops, an entertainment venue, and a primary school.

Macro level connectivity data from the CDAT indicates that if certain destination types are not located within or served by frequent and rapid transit from the proposed development, that large percentages (refer to Figure 9 in Appendix 2D) of the newly settled population would not be able to access vital services via walking/public transit within 30 minutes. If increased to a one-hour timeframe, residents still would not have access to a doctor's office, hospital, shopping center, or higher education opportunities. While some future Sandy Lake residents might have access to a subset of destinations in less than 30 minutes, average travel times often exceed 30 minutes. Even destinations seemingly more accessible to more of the development population such as park land and grocery require a 30-minute walk on average.

The third scenario recalculates average active transportation access times if shopping and entertainment along with basic health care options are included in the commercial portions of the proposed development. Average active transportation travel time to previously described destination types drops to 12-13 minutes for new development residents.

Finally, analysis outputs indicate that roughly half of the Study Area residents would not be able to access any public transportation routes within 30-minute walk if buses do not more closely service the development. When a stop is added to the Study Area, the average time required to reach transit by walking drops from just under 40 minutes to roughly 10 minutes.

Detailed Transportation Modelling

An agent-based modelling approach predicts how trips will be distributed to and from the development site. This process involves assigning each Sandy Lake residence a place of work and, at the same time, matching the projected Sandy Lake employment opportunities with potential residents. This allocation of trips is carried out using a gravity-based distribution model, which factors in both the distance between residential areas and employment centers, as well as the size and capacity of these employment areas. The model ensures a balance of trips by weighing the proximity of residents to available job spaces. In addition to work-related trips, the agent-based model also accounts for other tour-based travel patterns, such as school commutes and shopping trips.

The forecast distribution of trips between the Study Area and other areas of the HRM as well as internal trips within the Study Area describes the variance of trip mode share for internal and external travel demand. Trips made by private auto comprise 90 percent of total trips. Walking trips comprise nine percent of trips within the Study Area as compared with five percent of external trips. Transit is forecast to handle three percent of external trips. Note that the model produces conservative estimates of active transportation demand. The presence of residential, commercial, and recreational spaces in close proximity may encourage higher levels than predicted. Actual walking and cycling trip rates could exceed the model's estimates dependent on the quality of the development's active transportation facility network and transit routing/stop placement.

The development of Sandy Lake is expected to significantly influence traffic patterns on the surrounding highway network. As the project introduces new residential, commercial, and educational facilities, the resulting increase in travel demand will have direct implications for highway capacity, congestion, and overall traffic flow. Detailed analysis of the projected highway traffic impacts focuses on key corridors and junctions that will experience the greatest shifts in volume.

A Volume-to-Capacity (V/C) analysis of forecasted transportation network constraints in a 2045 Do-Minimum scenario identifies a significant increase congestion by the 2045 forecast year without introduction of the proposed Sandy Lake development. Traffic congestion is expected to increase significantly along Highway 102, especially around the Bedford Interchange and further south towards Highway 103. Larry Uteck Boulevard will also experience more congestion. The Bedford Highway and its connection to Highway 111 are similarly forecasted to remain congested while the most severe congestion is projected for the MacKay and Macdonald Bridges. In general, traffic congestion is expected to be more severe during the evening peak period compared to the morning.

Delay per kilometre assessment reinforces V/C analysis and reflects the same congestion areas. Highway 102, Hammonds Plains Road, Larry Uteck Boulevard, and the two bridges show significant delay of greater than two minutes per kilometre.

Flow differential analysis highlights the distribution and impacts of car trips from the Sandy Lake development. The largest increases in traffic volume are seen along Hammonds Plains Road and Highway 102 during both the AM and PM Peak periods. A significant increase in travel demand is also noticed along Larry Uteck Boulevard. Reassigned background trips due to increased congestion along Hammonds Plains Road divert to utilize Lucasville Road and Highway 101.

The Bedford Interchange of Highway 102 represents an important junction greatly impacted by forecast transportation demand. Vehicles accessing southbound Highway 102 from Hammonds Plains Road comprise the greatest increase in AM peak traffic flow. During the PM peak period, the largest impact is observed to be trips travelling from northbound Highway 102 to westbound Hammonds Plains Road.

Travel delay change assessment highlights the delay increase between modelled scenarios for the AM and PM peak periods along Hammonds Plains Road, Larry Uteck Boulevard, and Highway 102 between Clayton Park and the Bedford Highway 101/102 interchange. Increase in delay across the Macdonald and Mackay Bridges is caused by their sensitivity to congestion. A minor increase in traffic demand causes an exponential increase in delay.

The proposed Bus Rapid Transit (BRT) and additional ferry routes from Mill Cove to Halifax Central Business District are included within each modelled scenario. Investigating transit demand versus capacity throughout the HRM highlights several routes that will be already operating at or near capacity in 2045.

The impacts of transit demand changes due to a large-scale Sandy Lake development compare passenger volumes at the link level between modelled scenarios, highlighting the anticipated increase in transit usage stemming from the proposed development. The predominant destination area of transit demand from the Sandy Lake development is shown to be the Halifax CBD and areas within Dartmouth, taking capacity away from the already oversaturated transit network routes along Larry Uteck Boulevard and Dunbrack Street. The largest anticipated increases of transit ridership on individual transit lines during peak periods in response to the introduction of the Sandy Lake development correspond to the proposed BRT Purple Line and other proposed routes connecting new ferry routes to bus rapid transit. A significant uptake of remaining capacity along transit lines in proximity to Sandy Lake indicate a need for augmented transit frequency along Hammonds Plains Road and Larry Uteck Boulevard.

Conclusions

To provide a more accurate assessment of environmental and social impacts related to transportation access, it is important to understand detailed development plans, especially those involving commercial services. Additionally, the need for an easement or property sale to extend Bluewater Road affects transportation planning, including trip assignments. Addressing these issues will improve connectivity analysis and the placement of transportation infrastructure and shared mobility services.

Travel modelling suggests that Highway 102 travel demand is expected to far exceed capacity by 2045, leading to severe congestion regardless of the introduction of the Sandy Lake development. Mitigation measures for Highway 102 proposed by the Province (increasing the capacity of Highway 102 and upgrading key interchanges, such as Exit 2 at Kearney Lake Road and Exit 3 at Hammonds Plains Road) should ideally be implemented before development to prevent further exacerbation of congestion. In addition to planned improvements on Hammond Plains Road, further junction upgrades are required to accommodate eastbound and westbound movements efficiently at the Highway 102 interchange.

By 2045, the proposed BRT system is already projected to be over capacity, even without the additional demand from the Sandy Lake development. Several transit services near Sandy Lake will also exceed their capacity. Extending the proposed BRT Purple Line to Sandy Lake would connect it to Halifax's CBD and areas north of the MacKay and Macdonald Bridges, aligning with expected travel patterns. Alternatively, additional BRT services, such as an orbital route around the Bedford Basin, could connect Larry Uteck Boulevard to Dartmouth Crossing or Commodore Drive, enhancing transit connectivity and reducing pressure on Highway 102.

Creating active travel connections from Sandy Lake to Sackville, Lower Sackville and commercial areas such as Bedford Common would be highly beneficial. These links could connect internal infrastructure to nearby destinations, supporting active transportation as an option for residents due to the relatively short distance.

Figure 3.5 shows the various recommended transportation improvements.

Environmental impacts depend on the accurate representation of transportation facilities in development plans. Developers must specify right-of-way dimensions for on-site roadways. Alignment must ensure that all residents are within a 400-metre walk of a transit stop. Understanding the final configuration of vehicle parking and the amount of impermeable surface has implications for future planning and for achieving mode share targets. Only with these factors fully understood can environmental impacts be properly assessed.

Recommendations

HRM should explore physical roadway interventions. Hammonds Plains Road should be widened west from Gary Martin Drive to Bluewater Road, the anticipated eastern access to the largest proposed development. Hammonds Plains Road should also be adjusted near its Highway 102 interchange, which also needs modifications to increase capacity for west-to-south traffic during the morning peak and south-to-west traffic during the evening peak. Connection from Hammonds Plains Road to Highway 101 should be explored. Section 3.6 summarizes all upgrade costs and who should be responsible.

Transit routes should connect the subject lands to regional destinations via east and south connections, including upgrades like transit priority lanes. These lanes should be considered along Hammonds Plains Road to make transit a competitive alternative to personal vehicles. Transit should also connect to ferry routes proposed in the Rapid Transit Strategy.

Primary corridor designs should include a multi-use path along Hammonds Plains Road (between Larry Uteck Boulevard and Bedford Highway) and Larry Uteck Boulevard (between Hammonds Plains Road and Brookline Drive) to enhance non-motorized user connectivity, safety, and accessibility to enhance user safety and accessibility. Design should employ high visibility treatments at pedestrian and cycling crossings to ensure safe movement across the roadway and better connect communities to existing amenities and services.

Major new development should properly site a mobility hub that provides the maximum number of transportation options to the maximum number of new residents and employees.

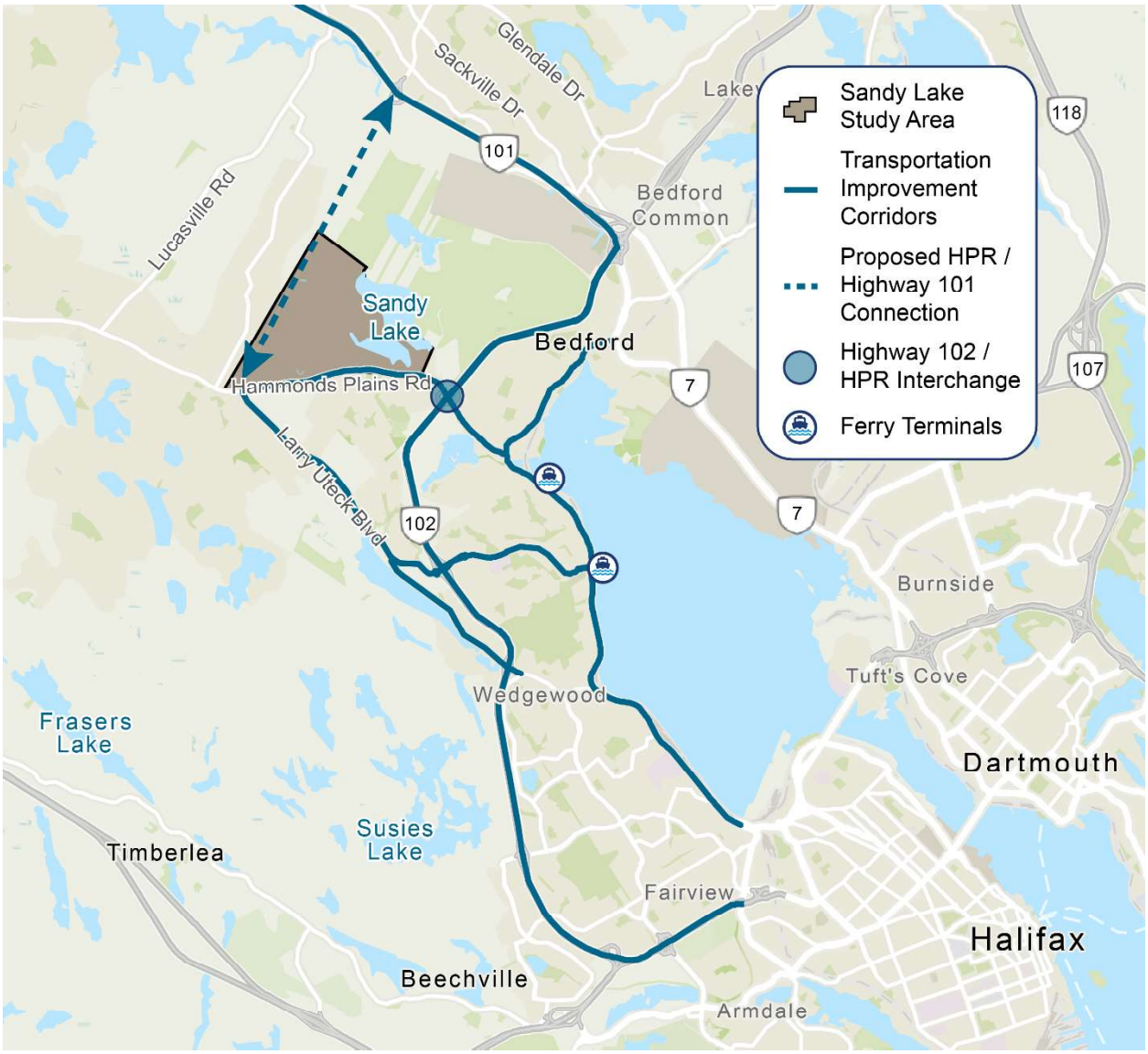

Figure 3.6 Recommended Transportation Improvements

Follow-On Work Required

To meet the mobility study goals of the Future Serviced Communities initiative, further investigations, analysis, and planning are needed. Without proactive planning and investments, the proposed Sandy Lake development, located in the Inner Suburban region of HRM, is expected to be car oriented. Additional work will be required to support HRM policies promoting transportation alternatives. This following work should be addressed in Transportation impact studies as part of further detailed development plans, and it may require further analysis by HRM.

- Connectivity analyses will need to be repeated as assumptions and site uses become clearer. It is important to consider the cumulative effects of multiple short-term developments, especially along the Highway 102 Corridor, focusing on the function of the 100 series highways and interchanges. These should be explored by the developer in consultation with HRM.
- Future planning for the Beaver Bank Connector Road by the Province and HRM must evaluate its impact on the broader transportation network, especially the Study Area. This connection, linking Hammonds Plains Road with Highway 101, should consider the cumulative effects of nearby developments, traffic relief on existing routes like Highway 102, and implications for land use, the environment, and community disruption. Detailed traffic projections are needed to determine road capacity and guide development decisions. Integrating smart growth principles and promoting alternative transportation modes will require careful planning and stakeholder engagement to enhance regional connectivity and mitigate negative impacts. Any new transportation corridor that creates a new option for residents in the Sandy Lake area to travel to Bedford without using the Highway 102 corridor will create better traffic distribution, improve access to services, and not add as much additional traffic to Highway 102 for local trips.
- Using a more detailed development plan, the developer in consultation with Halifax Transit should determine ideal routing for high quality transit service that links to top regional destinations and corridors. Accurate assessment and service provision can spur demand-based service improvements that create a positive feedback loop of higher use.
- Through development application-specific transportation impact modelling, the proponent should demonstrate how many units in early phases of development could proceed in advance of major improvements to Hammonds Plains Road.
- HRM should determine the feasibility and benefit-cost of bus-only facilities to position transit service as a competitive alternative to personal vehicle use. Consider including queue jumps at intersections or entire travel lanes on Hammonds Plains Road.
- Future iterations of the development plan by the developer must reflect high quality active transportation facilities that support seamless movement to destinations and transit stops. Importantly, future facilities should be built to a high standard of quality, robust throughout all seasons.
- Additional detail in the development site plan enables efficient implementation of shared mobility services that offer localized access for Sandy Lake residents and expand access to nearby neighborhoods without requiring personal vehicle ownership.

- To fully understand traffic volume and congestion mitigation needs, supplementary analysis of junction performance in the developer's Transportation Impact Assessment is necessary for a complete assessment of network impacts and potential bottlenecks.
- Beyond detailed congestion-focused modeling, the community design process should explore variations in trip internalization and travel distribution patterns to help integrate active transportation within the development and its surrounding areas, potentially reducing reliance on car travel.

3.6 Infrastructure Costing

The order of magnitude costs of providing the conceptual servicing are shown in the following **Table 3.2**. Note that cost estimates in this report are high-level order of magnitude costs. They are not Class D Estimates. A Class D Cost Estimate is an indicative estimate used in the early stages of a project. It is based on a comprehensive statement of requirements, potential solutions, and/or a functional program. The various infrastructure requirements in this report have not been studied to a functional level of design; that will occur in future planning processes.

The relative difference in cost for on-site infrastructure between the three development scenarios will be negligible, since the major earth moving costs to create linear infrastructure will be the same regardless of development density. All cost estimates that follow are based on the high-density scenario unless stated otherwise. The costs between pipe sizes to accommodate differing population levels are a relatively small portion of the cost. There may be some minor differences in the sizing of storm ponds, but the differences could be erased during detailed planning if high density land uses had a lower impermeable lot coverage.

The cost estimate does not include regional level public transportation upgrades such as the cost of the Purple line BRT or improved ferry services which are not yet funded.

Table 3-2 Estimated Order of Magnitude Costs for Infrastructure

Servicing Component	Estimated Order of Magnitude Cost[2]
Provincial Responsibility	
Highway 102 Corridor Traffic Mitigation Measures	Provincial responsibility – not costed
Highway 102 and Hammonds Plains Road Ramp Improvements. Hammonds Plains Road should also be adjusted near its Highway 102	Provincial responsibility – not costed

[2] Construction inflation estimates are based on Statistics Canada for the Halifax Census Metropolitan Area. Building construction price indexes, by type of building and division

interchange, which also needs modifications to increase capacity for west-to-south traffic during the morning peak and south-to-west traffic during the evening peak.	
New road link connection from Hammonds Plains Road to Highway 101	Provincial responsibility – $17.27M for two-lane non-local roadway (excluding any opportunities for below grade infrastructure improvements)
HRM Responsibility or Halifax Water Responsibility	
Twinning of the Pockwock Transmission Main	Halifax Water cost
Integrated modification to Larry Uteck Boulevard corridor. Upgrades to the water transmission main, twinned for growth and redundancy. Additional lane from Kearney Lake Road to Hammonds Plains Road. Multi-use path from Hammonds Plans Road to Brookline Drive	Halifax Water cost for system resiliency. Approximately $16.06M for combined transportation enhancements. Level of modification dependent on Bus Rapid Transit extension. Lane addition estimate of $13.88M. Multi-use path estimated between $1.00M and $1.18M dependent on width.
Culvert upgrades: these culverts include the culvert crossing Farmers Dairy Lane and the culvert downstream of it, as well as the culvert located at the outfall, also crossing Farmers Dairy Lane.	Culvert 13 (Length=16.6m) - $2.28M) Culvert 14 (Length=33.4m) - $3.58M Culvert 19 (Length=72.9m) -$11.66M
Intersection Enhancements: Hammonds Plains Road at Larry Uteck Blvd, Gary Martin Drive, Bluewater Road	$0.4M to $1.27m per intersection
Integrated reconstruction of Hammonds Plains Road, addressing grading from flood risk in the Bluewater Road area, upsizing the culvert at Farmers Dairy Lane, widening as necessary (transit priority or general purpose) from Larry Uteck Boulevard to Bedford Highway, adding sidewalks from Larry Uteck Boulevard to Brookshire Court, and adding cycle tracks from Larry Uteck Boulevard to Bedford Highway. ROW to be constructed for possible future roadway widening, new watermain on the	$30.33M for transportation enhancements – estimate requires further refinement to account for flood protection works and transit priority after more detailed hydraulic modelling. This includes $18.41M for widening for lane addition (transit priority or general purpose to be determined), $2.64M for sidewalks, $3.04M for cycle tracks, and $6.24M for watermains, linear infrastructure, and culvert upgrades. Cost excludes property acquisition and permitting costs. We assume that HRM would pay for

western portion of the road reconstruction, and replacing the Hammonds Plains Road Trunk Sewer.	those upgrades but collect much of the cost back through a Capital Cost Contribution for the portion attributable to population growth from the new development. HRM could request a contribution from the Province, but that is entirely at the Province's discretion.
New Pressure Reducing Valve and/or replacement of the Peerless Pressure Reducing Valve on Farmers Dairy Lane	Approximately $1M - covered by Capital Cost Contribution
BRT Purple Line extension from Larry Uteck West Station to intersection of Larry Uteck Boulevard and Hammonds Plains Road	$0.48M for the station, $7.74M for transit priority lanes and intersection improvements, $2.61M annual operating costs per 2020 Rapid Transit Strategy
Hammonds Plains Road non-BRT enhanced bus service	$1.08M to $1.57M annual operating cost
Larry Uteck Boulevard non-BRT enhanced bus service	$1.08M to $1.57M annual operating cost
Bedford Highway – Increased capacity (i.e., one lane only due to property constraints) from Union Street to Highway 11	$35.1 million per Class D Plan estimates (2019) which is $52.7M (2024) with inflation. Cost excludes property acquisition and permitting.
Supplementary Active Transportation Safety Enhancements	$112k
Developer Responsibility or Shared Responsibility	
On-site grading/earthworks and stormwater management works	Developer responsibility – not costed
On-site water distribution and sanitary sewer collection	Developer responsibility – not costed
Replace/upgrade Twin Cities wastewater Pump Station onto Clayton lands	Developer responsibility (shared) – $8.1M – $8.4M (2017) the original estimate by DesignPoint, which is $13.3M -$13.8M (2024) with inflation.
Replace Temporary Pump Station #1	Developer responsibility (shared) – $9.6M - $9.7M (2017) the original estimate by

	DesignPoint, which is $15.7M - $15.9M (2024) with inflation
3.9ML water storage/reservoir recommended in 2009 study by CBCL (capacity to be reviewed and updated)	Developer responsibility (shared) - $24M – likely funded through Capital Cost Contribution to be determined at a later date
New Twin Cities Pumping Forcemain	Developer responsibility (shared) – $3.1M (2017) original estimate by DesignPoint, which is $5.1M (2024) with inflation
New Pumping Station 1 Forcemain	Developer responsibility (shared) – $2.0M (2017) original estimate by DesignPoint, which is $3.3M (2024) with inflation
Extend 600 mm gravity sewer from Bluewater Road to Pumping Station 1	$4.9M funded through a future Capital Cost Contribution to be determined at a later date
Lifecycle replacement and relocation of the Bedford Connector 750mm water transmission line currently going through Clayton Lands, identified by Halifax Water	$15.3M – potential cost sharing with the landowner, covered by Capital Cost Contribution
Intersection Enhancements: new Sandy Lake access	$1.27M – new Sandy Lake Access

3.7 Considerations for Future Planning

While certain areas of the Study Area are not suitable for development for a variety of reasons, including flood risks and ecological sensitivities, a sizable part of the site could be used to support HRM's rapidly growing population in new residential and mixed-use communities.

Based on the consolidated findings of the four technical studies for the Study Area, and discussed in further detail below, should HRM proceed with secondary planning, HRM should work with the various landowners to try and achieve as much density as possible on lands furthest from the natural features to concentrate development on a smaller footprint and achieve density levels that support a more integrated mixed-use community that is transit supportive. In addition, higher densities will spread the high cost of servicing this Study Area over more units of development to mitigate the costs to individual homes.

We acknowledge that it would be ideal to concentrate as much density over a small land area as possible to minimize the overall lot coverage. However, it is appropriate that there be a mix of housing typologies in the overall development with some high, mid, and low-density development. The cost of high-rise construction for new housing for up to 12 storeys is 47% to 54% higher than the cost of construction per

square foot for single unit dwellings according to a 2024 Canada Cost Guide report by Altus. The cost of less dense and less expensive forms of muti-unit housing such as townhouses and stacked townhouses are comparable to the costs of constructing single unit dwellings.

The Provincial Housing Needs Assessment, 2023, recommended that 40% of all new housing be single unit housing with the remaining 60% being a combination of different forms of multi-unit housing. The Provincial Housing Needs Assessment is a practical set of targets that could be used in further community planning.

The following are integrated observations from the various reports that elaborate on the principal conclusions above:

Ecology and Water Quality

From an environmental perspective, avoiding the lands shown with low suitability in the LSA provides protection of ecological resources and addresses terrain-based constraints. From a water quality perspective, the number of people living in the Study Area has less of an impact in comparison to the amount of hard surface coverage created. The amount of land area left in its natural or unurbanized state has a greater impact on water quality than population density. Low density development typically has low lot coverage for buildings and more paved areas per hectare. Medium and high-density development have very high lot coverage for buildings and paved parking areas in comparison.

Watercourses should be buffered from development with the buffered areas remaining in as natural a condition as possible. The LSA recommends areas within 30 m of a watercourse have low suitability for development, so setback areas from watercourses must be studied on a site-specific basis during subsequent area planning to determine suitability. Retaining native and existing ground cover in its existing or replacing it in a naturalized condition should be prioritized wherever possible to preserve ecosystem service function (i.e., nutrient cycling, soil formation, water purification, and pollination, among others), reduce volume of runoff discharged into watercourses, promote infiltration, and provide an opportunity for evapotranspiration.

The highest density and high lot coverage land uses should be clustered as close as possible to Hammonds Plains Road to promote a compact and walkable community and to keep these uses further from the watercourses, where the higher lot coverage impacts water quality. Low density, lower lot coverage single unit dwellings, or semi-detached residences should be organized in the intervening space between the high-density areas to the west and the remaining undeveloped areas to the north-east since they generate less runoff and on-site stormwater mitigation measures are easier to incorporate.

There is potential presence of Species at Risk (SAR) throughout the entirety of the Study Area. This is attributable to the potential presence of yellow-banded bumblebee, which has an extremely broad niche. This species can potentially be found in all terrestrial habitat types in the Study Area. Areas potentially capable of supporting multiple SAR are typically associated with four habitat features including watercourses, wetlands, mature forests, and anthropogenic habitats. Watercourses provide habitat and travel routes for a variety of SAR that have been recorded in the vicinity of the Study Area including Atlantic salmon, American eel, common snapping turtle, eastern painted turtle, and wood turtle. SAR

associated with wetlands include Canada warbler, olive-sided flycatcher, rusty blackbird, yellow-banded bumblebee, and black ash. SAR associated with mature forests include chimney swift, eastern wood pewee, evening grosbeak, little brown myotis, northern myotis, tri-colored bat, and yellow-banded bumblebee.

Many of the areas where SAR are potentially concentrated are linked by watercourses. This is probably attributable to several factors. The watercourses provide habitat for their own suite of SAR. Wetlands often develop along these watercourses or are the headwaters for water courses and support a different group of SAR. The riparian habitats along the watercourses are protected by buffer zones within which no forest harvesting may occur. Therefore, the remnants of mature forest in the Study Area have become concentrated along the shores of these watercourses. These mature forest remnants provide habitat for other SAR.

These linear concentrations of SAR are of particular benefit since they can provide both habitat for SAR and corridors to connect plant and animal populations in urban areas. This is why these studies conclude that retaining large areas of undisturbed lands to the north end of the Study Area and adjacent to Sandy Lake is necessary.

No new development should be permitted within the limits of the 100-year regulatory floodplain. Some reduced risk uses may be considered in agreement with HRM by-laws and the Nova Scotia Statement of Provincial Interest regarding Flood Risk Areas. This is subject to design considerations that effectively mitigate and/or minimize the impact of such development on the floodplain and protect the riparian corridor functions. Detailed hydraulic modeling of the watercourses should be completed to better understand flooding risks at the current location of SWM Pond 1 and SWM Pond 2 as the current 100-year floodlines are based on a high-level model and are subject to change.

In particular, to minimize future flood-related impacts, it is recommended to restrict development on the Sandy Lake side of the road in the vicinity of the Hammond Plains Road and Bluewater Road intersection (shown in **Figure 3.3**). By limiting new construction and structural modifications within this flood-prone area, the potential for property damage and adverse environmental impacts can be reduced, supporting a more sustainable and resilient infrastructure approach.

The developer requested development scenario presented in this work needs to be updated to reflect the findings of this report. In particular, refinement to the edges of the development areas should be undertaken to account for Johnsons Brook and the unnamed watercourse that traverse the site. These refinements should address the flood vulnerable lands and recommended buffers from the watercourses.

Clayton Development's development proposal allocates over 200 acres to be incorporated into the Regional Park. Most of this land is not suitable for development and it has real value for the proposed park partly because it incorporates substantial wetland areas (i.e., valued habitat) and largely drains into Sandy Lake. Maintaining the area in a natural state will assist with maintaining the quality of Sandy Lake and, by the by, will create a buffer between the residential development and the Agropur plant.

While the most northerly pocket of proposed development in the Clayton plan is feasible to service and it is not low suitability lands, it will have to be thoughtfully planned with low-impact development designs to

address the adjacent natural features. It is not a suitable area for mid- or high-density development since it will be far from the transit service and more dense forms of development create more impacts on surface water quality, but there is no particular barrier to low density development. Nevertheless, HRM should continue discussions with Clayton regarding the most easterly portion of the site where low-density development is proposed. If the same population could be transferred to the remaining development area in the portion of the site closer to Hammonds Plains Road, and if HRM and Clayton could reach a mutually agreed upon arrangement to take in this additional land into the Regional Park, that would be beneficial.

To facilitate wildlife movement, a north/south corridor along Sandy Lake's western shore is recommended. Development areas within the Study Area are surrounded by areas used by wildlife for movement, and road and utility crossings should use bridges to maintain corridor integrity. The existing transmission line corridor at the northern end of the Study Area may act as a minor barrier to wildlife movement. Staggering brush cutting along this corridor can ensure continuous security cover for wildlife. Overall, these wildlife corridors will help maintain ecological connectivity, protect sensitive habitats, and provide recreational opportunities for adjacent communities. Conservation easements are suggested to protect these lands and their benefits.

There may be other community design modifications that can be explored during any future detailed planning phase such as clustering a school or other open spaces so they could become an informal gateway to the Park. In addition, HRM should enter into discussions with the other landowners to the southwest about incorporating additional lands that have been shown as not suitable for development to create an entry into the Park from Hammonds Plains Road.

Transportation

From a transportation perspective, the same upgrades would be required in every development scenario to address the increased travel demands from any level of development. Higher density development is desirable to make the public transit and active transportation improvements create a higher modal shift from automobile trips. 30-50 units per hectare is typically considered an appropriate density to support frequent bus service (crcopg.org). The anticipated densities for both the developer-requested and high-density scenarios scenario are within that range. The relative impact of going to higher densities on the overall transportation network, prompting upgrades, is negligible between the two development scenarios. There is no “tipping point” per se where the multi-modal transportation system cannot be upgraded.

Higher density development is also desirable because it reduces the distance between residential and commercial components of the development site, increasing the likelihood those trips are taken by active transportation modes.

Ideally the densest development should cluster near Hammonds Plains Road to attempt to capture as many trips to other developed areas of West Bedford by non-auto modes as possible. The developer proposed plans should cluster high- and mid-density development plus local commercial and schools on a local transit loop toto make a consolidated cluster of transit demand, improving the viability of transit services to the area. HRM should work with Clayton Developments to create a Mobility Hub within the

development area and mixed-use transit-oriented development nodes at the three proposed access points.

To address transportation needs and reduce socioeconomic disparities in Sandy Lake's potential future population, it is essential to increase the density of multi-unit developments, particularly those near transit stops. This approach will not only support higher population densities but also promotes sustainable modes of transportation, reducing reliance on costly or difficult travel, and reducing impacts on existing road capacity. Additionally, the integration of essential services and retail options within these the proposed developments or nearby areas will enhance accessibility, especially for non-motorized users, aligning with policy objectives of the Reginal Plan.

Extending Bluewater Road may not be feasible for a number of reasons. The Agropur representative interviewed by Stantec said the company is happy with the current location of their plant and have no plans to leave, so that would impede the extension. He stated that the extension of Bluewater Road across Farmers Dairy Lane would interfere with vehicles coming from and going to the plant. He added that Agropur is concerned with possible conflicts with large numbers of residents close to their plant. Making the connection to the northeast involves crossing a considerable flood vulnerable area, and adding more infrastructure in that area may exacerbate known existing drainage problems around Hammonds Plains Road.

Portions of Hammonds Plains Road will require significant reconstruction to manage known flooding problems by raising the grade by 5-6 metres in the deepest sections. This presents an opportunity to reconfigure the right-of-way to provide enhanced transit priority measures and active transportation facilities.

Servicing

Stantec was provided input on the regional water and sanitary sewer system capacity by Halifax Water. Stantec is not in a position to analyze the differences between the developer requested and high-density scenarios as it does not have access to the water and sanitary Regional hydraulic model, or information pertaining to available capacities of the regional infrastructure. It is Stantec's understanding that the Developer Requested scenario is an outcome of discussions between Clayton Developments and Halifax Water of what is likely able to be accommodated in the downstream conveyance system for sanitary sewer and has been included in previous versions of Infrastructure Master Plan (IMP). Stantec's report identifies the anticipated sanitary flows, and water demands for each development scenario, which provides further direction to Halifax Water with respect to planning requirements for the regional infrastructure, which should be taken into consideration as part of the next IMP update and/or updates to Area Specific Studies. It is our understanding that the cost of the regional infrastructure upgrades would be recovered through Development Charges/Capital Cost Contributions (CCC). HRM will need HW to comment on further costs or limits to upgrading system-level sanitary sewer infrastructure.

Financial

Opening the area for development, in Stantec's high-level order of magnitude estimate, requires a considerable investment of approximately $203M at the high end of the range of estimates. This

investment would come from a mix of developer, HRM, Halifax Water, Provincial, Capital Cost Contribution, and shared infrastructure investments.

On a “per door” (total cost divided by the number of estimated housing units), that represents approximately $46,800 per door for the low-density scenario, approximately $28,600 per door for the developer-requested scenario, and approximately $20,700 per door for the high-density scenario. While the infrastructure investment could likely be reduced slightly for the low-density scenario, many of the infrastructure upgrades are still required regardless of the scenario.

The high-density scenario would be ideal to share infrastructure costs and make transit more viable, provided Halifax Water can address any additional downstream sanitary sewer conveyance concerns. If not, the Developer Requested Scenario is the next best option from a cost/financial perspective.

Next Steps

Development in the Study Area will need deeper consideration of a series of tradeoffs between different municipal planning objectives in subsequent steps of community planning. The next step will be for HRM to review the completed studies and determine if comprehensive neighbourhood planning should be initiated, also known as secondary planning, which should include an updated master servicing study. In any subsequent planning steps, it will be essential for landowners to coordinate servicing strategies with the regional infrastructure as noted by Halifax Water and summarized in the detailed Development Servicing Scenario report. This will be a major complexity of confirming the overall density and population for the Study Area. This needs to be carefully integrated with community design since there are significant interdependencies.

APPENDICES

Appendix 2A Sandy Lake Land Suitability Analysis

Appendix 2B Sandy Lake Watershed and Stormwater Study

Appendix 2C Sandy Lake Development Servicing Scenario

January 27, 2025

Appendix 2D Sandy Lake Transportation Analysis