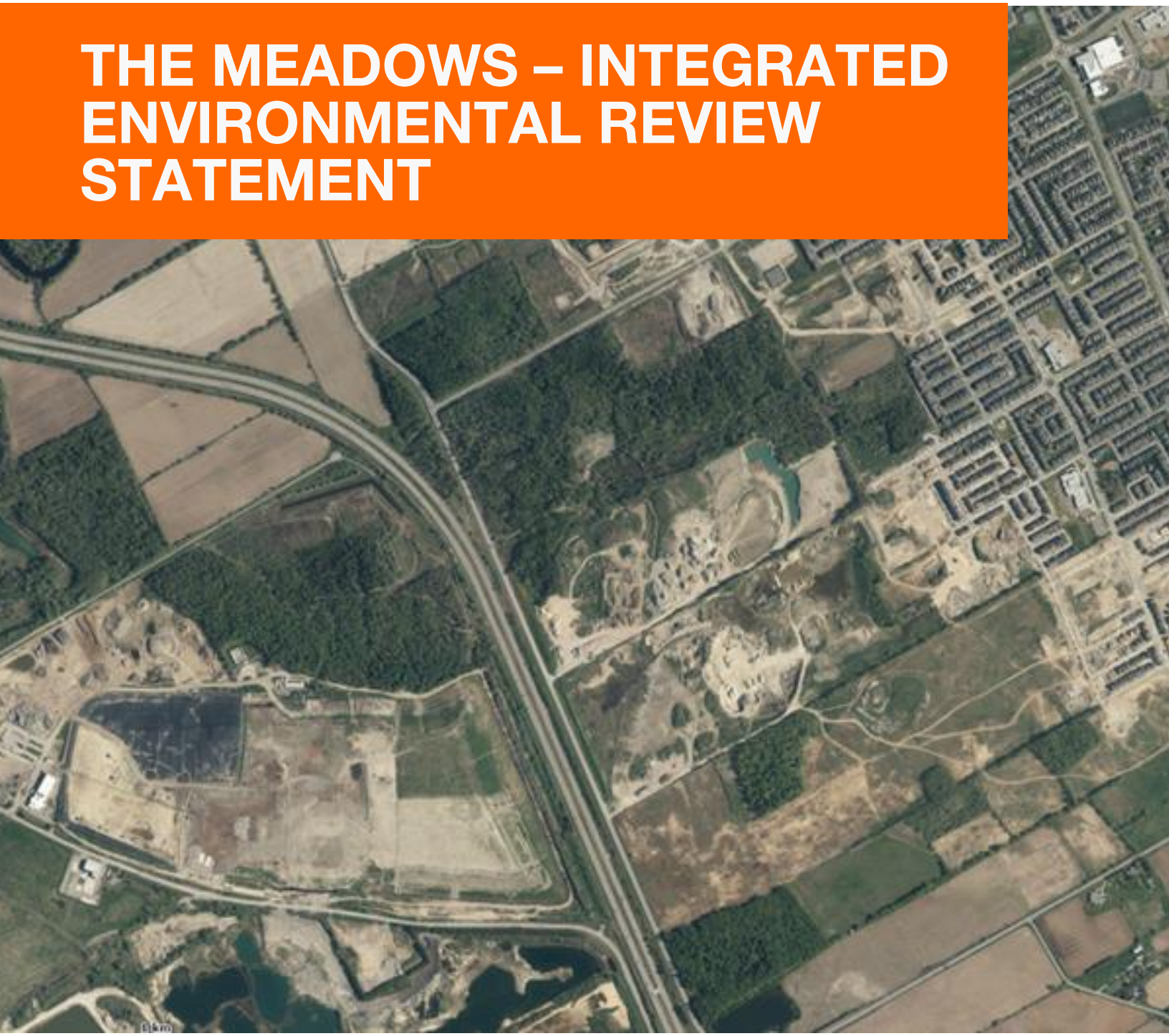
FOTENN

THE MEADOWS – INTEGRATED ENVIRONMENTAL REVIEW STATEMENT



May 04, 2018

Integrated
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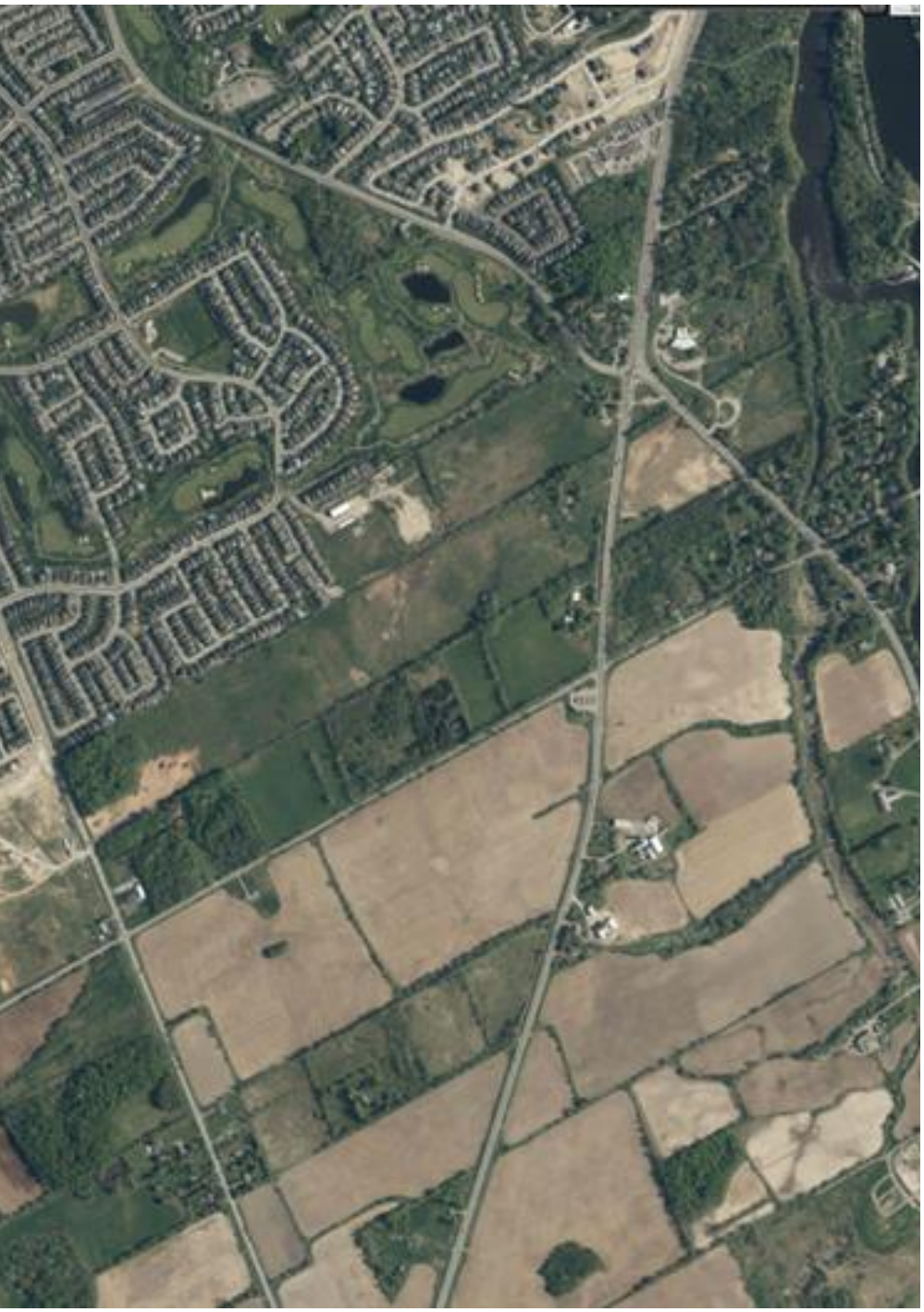
Statement



Prepared for:

TAMARACK

Tamarack Homes
3187 Albion Road South
Ottawa, ON K1V 8Y3

Prepared by:

FOTENN Planning + Design

Fotenn Planning + Design
223 McLeod Street
Ottawa, ON K2P 0Z8
fotenn.com

May 04, 2018

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1.0 INTRODUCTION

FOTENN Consultants Inc. has been retained by Tamarack (Nepean) Corporation to prepare an Integrated Environmental Review Statement (IERS) in support of the proposed Meadows Phase 5 & 6 Plan of Subdivision for 3640 Greenbank Road, located in the Barrhaven South community of the City of Ottawa.

Tamarack Homes proposes a subdivision consisting of 346 detached, semi-detached, traditional townhouse and back-to-back ("gallery town") dwelling units, a school site and associated parkland in Barrhaven South. The development, as well as all supporting infrastructure including roadways and municipal services, will be integrated with adjacent development to the east (previous phases of 'The Meadows') and to the north (Mattamy Half Moon Bay West).

The requirements for an IERS are outlined in Section 4.7.1 of the City of Ottawa Official Plan which states:

Policy 4.7.1 (1)
Subdivision, and site plan and rezoning applications requiring an Environmental Impact Statement, Tree Conservation Report or landform feature assessment, will be accompanied by an integrated environmental review statement demonstrating how all the studies in support of the application influence the design of the development with respect to effects on the environment and compliance with the appropriate policies of section 4. The appropriate policies and studies will be identified through pre-consultation at the beginning of the design and review process.

Policy 4.7.1 (2)
The integrated environmental review statement will provide:

- *A brief overview of the results of individual technical studies and other relevant environmental background material;*
- *A graphic illustration, such as an air photo, summarizing the spatial features and functions (e.g. natural vegetation, watercourses, significant slopes or landform features, recharge/infiltration areas) as identified in the individual studies;*
- *A summary of the potential environmental concerns raised, the scope of environmental interactions between studies, and the total package of mitigation measures, including any required development conditions and monitoring, as recommended in individual studies;*
- *A statement with respect to how the recommendations of the support studies and the design with nature approach have influenced the design of the development;*
- *An indication that the statement has been reviewed and concurred with by the individual sub consultants involved in the design team and technical studies; and,*
- *A description of how the proposed development maximizes the energy efficiency of development and to promote sustainable design that reduces consumption, energy use and carbon footprint of the built environment. A sustainable design checklist will be prepared to assist in this description.*

2.0 SITE AND PROJECT DESCRIPTION

2.1 Description of Site and Project

The subject property is located at 3640 Greenbank Road, west of existing Greenbank Road. Phase 5 and 6 of the project are located west of the future Greenbank Road realignment. The lands are legally known as *Part of Lots 9 and 10, Concession 2 (Rideau Front)* in the Geographic Township of Nepean. The Draft Plan of Subdivision has a total area of 19.39 hectares, and has no frontage along current Greenbank Road.
The lands are located south of the Jock River, east of Borrisokane Road (formerly Cedarview Road) and Highway 416, west of the future re-alignment of Greenbank Road, west of the existing Greenbank Road and south of the Cambrian Woodlot, as illustrated in Figure 2.

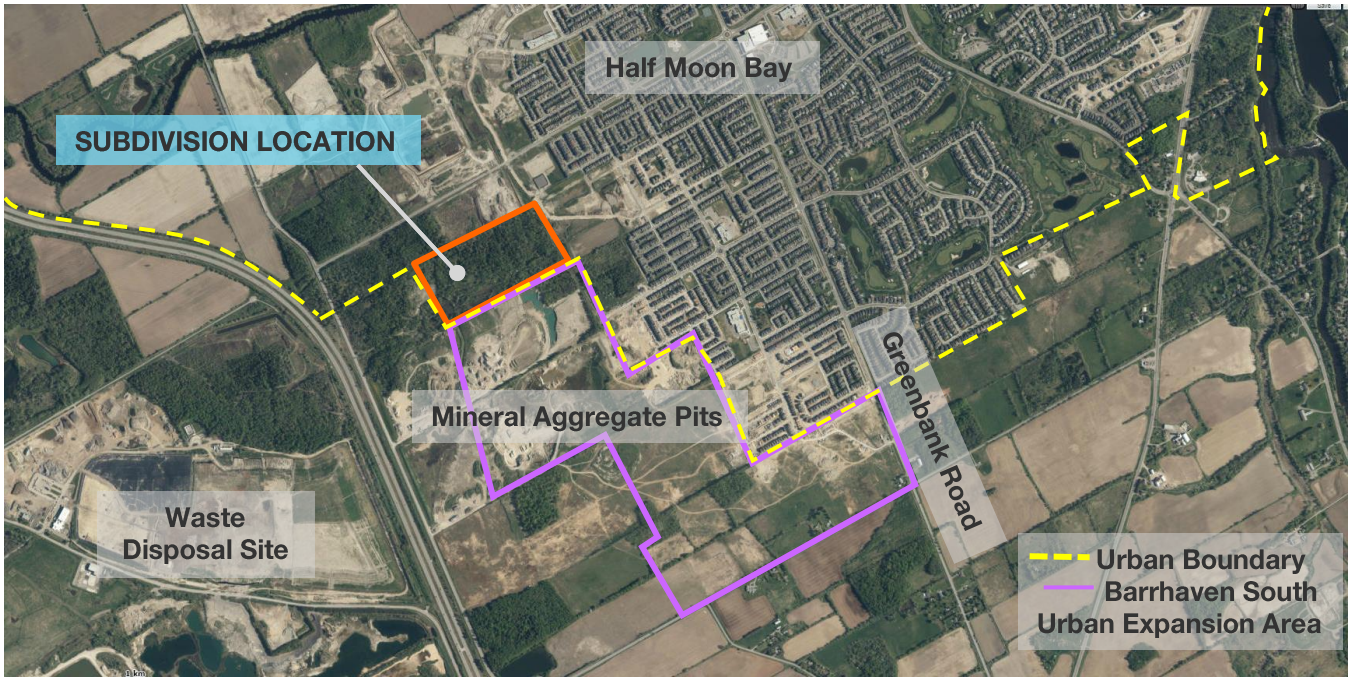

Figure 1: Location of Subdivision

The property is relatively flat, with a gentle slope from the south-west to the north-east portion of the site, and is presently vacant. Aggregate extraction operations previously occurred in the west and central portions of the site until the 1990's. A berm is present along the southern edge of the property and an elevated ridge is located through the centre of the property in the east-west direction. Other areas of the property appear to have been used in the past as pasture. The site is generally treed as a result of tree re-growth on the site over the last three (3) decades, following the previous aggregate extraction and agricultural uses. It is noted that one section of the site has been cleared and is possibly being used as a snow dump area.

As shown in Figure 1 above, the subject property is bordered to the south by a sand and gravel pit known as the 'Costello Pit', owned by George W. Drummond Ltd. As shown in Figure 2 below, much of the central and east portions of the site as well as the lands to the north and northwest are part of the Cambrian Woods Urban Natural Area. In 2006, the City of Ottawa defined a core forested area for the Cambrian Road Woods Urban Natural Feature, which has been acquired by the City and is now zoned Environmental Protection (EP1). The area was acquired from Mattamy Homes and is located directly north-west of the Meadows Phase 5 area. There are no Provincially Significant Wetlands or Areas of Natural and Scientific Interest in proximity to the site. Furthermore, there are no aquatic habitats present on the site.

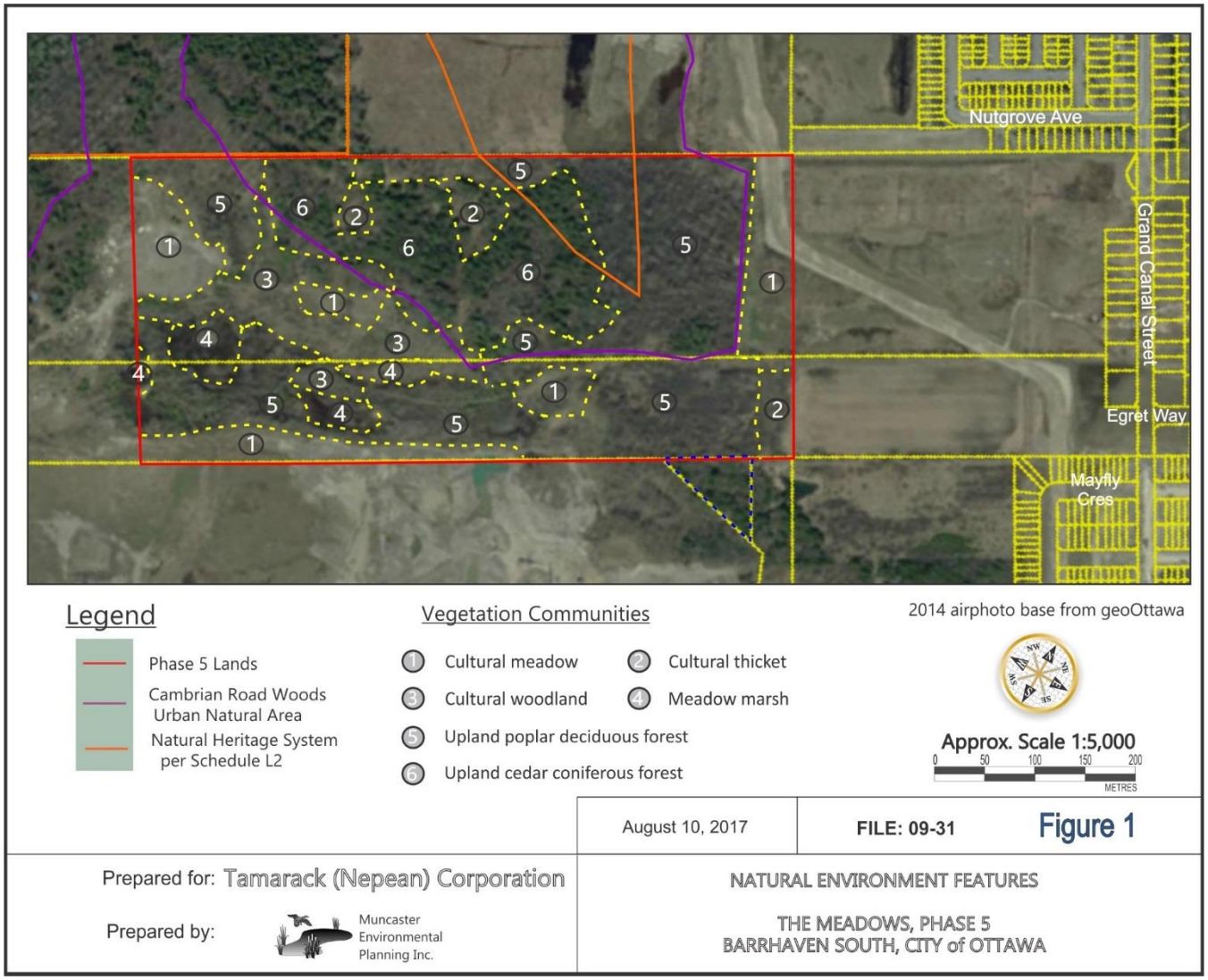

Figure 2: Natural Environment Features (Muncaster Environmental)

The soil conditions described in the Geotechnical Investigation indicate that there is generally a thin layer of topsoil followed by a layer of silty sand overlying either a sensitive silty clay deposit or a compact to dense glacial till and/or a loose brown silty fine sand. Groundwater levels were found to be between 0.2 and 3.1 metres below the ground elevation.

3.0
SUMMARY OF TECHNICAL STUDIES

This section provides an overview of the technical studies that were completed in support of the Draft Plan of Subdivision for the development of the site. These studies fall into three groups: engineering studies, planning studies, and environmental studies.

A summary describing the existing environmental conditions and identified potential environmental effects related to the proposed development is presented for each study, as required in Section 4.7 of the Official Plan. Each summary uses the exact language and wording in the technical study, where possible.

3.1 Engineering Studies

3.1.1 Transportation Impact Assessment

A Transportation Impact Assessment was submitted to the City of Ottawa in accordance with the Transportation Impact Assessment Guidelines. The report identifies "the range of analyses required to understand how well the development proposal aligns with City of Ottawa policies and objectives, and if the transportation network requires modification to offset development impacts."

The report concludes that the study area transportation network will accommodate site-generated traffic volumes. Furthermore, a Roadway Modification Approval is required to construct Street 1 which will cross the Mattamy Half Moon Bay West lands and connect with Cambrian road via a signalised intersection. This north-south collector road is required to provide vehicular access to the subject site. Access into and out of the subdivision will be supplemented with a future connection to realigned Greenbank Road once it is constructed.

3.1.2 Assessment of Adequacy of Public Services

An Assessment of Adequacy of Public Services was prepared by IBI Group which assesses the adequacy of public services for the proposed site. The report reviewed major municipal infrastructure including water supply, wastewater collection and disposal and management of stormwater. The report also includes a Sediment and Erosion Control Plan.

In general, the site will connect to storm, sanitary and water services that are proposed within the north-south collector road stemming from the Mattamy Half Moon Bay West development. As the roadway and the services are not currently proposed in the Half Moon Bay West Phase 1 site works, the proponent may be required to enter into a front-ending agreement with Mattamy Homes for the construction of the roadway and services to service the proposed subdivision.

An existing watermain is located on Cambrian Road. Water supply for the development will connect to the existing watermain on Cambrian Road by way of a watermain running south along the collector road (Street 1B). This will be extended east through the proposed subdivision to connect with the proposed watermain on Future Greenbank Road. As construction of Future Greenbank Road will not take place for several years, the proposed watermain was not included in the watermain analysis. Watermains have been sized to meet required fire flows.

The site is located in the South Nepean Collector Sewer drainage area. A trunk sewer has been constructed up to the Cambrian Road – Future Greenbank intersection. Plans for the Mattamy Homes Half Moon Bay West subdivision indicate that the trunk sewer will be extended to the west within Cambrian Road to the intersection of Cambrian Road and Street 1B. The proposed subdivision will outlet to a sanitary sewer in Street 1B. The sanitary flows anticipated by the proposed Meadows Phase 5 & 6 Subdivision have already been contemplated in the designs for the Mattamy Half Moon Bay West development. The IBI report confirms that the sanitary flow allocation accounted for in the Mattamy designs is adequate to service Phase 5 & 6 of the Meadows. It must be noted that the delayed construction of realigned Greenbank Road results in some deviation from the Barrhaven South Master Servicing Study, as outlined in the report.

The Barrhaven South Master Servicing Study identifies the Jock River as the ultimate receiving watercourse for Barrhaven South and recommends five (5) stormwater management facilities and associated sewer system to manage stormwater within the area. To date, the Corrigan and Todd facilities have been constructed and are operational. The proposed Clarke pond, located in the Half Moon Bay West community, is currently undergoing design review by the City of Ottawa. The entire Meadows Phase 5 & 6 lands are located within the future Clarke Pond drainage area. The Half Moon Bay West designs indicate that a storm trunk sewer will be installed to provide a connection to the pond up to the intersection of Half Moon Bay West Street 1A and Cambrian Road. Flows from the Meadows Phase 5 & 6 lands will be conveyed by way of a storm sewer in Street 1B, ultimately providing outlet to the Clarke Pond. This has been contemplated in the design of the trunk sewers for Half Moon Bay West.

In terms of site grading, the report states that grading of the subject site must take into account the proposed elevation of Future Greenbank Road and the abutting properties to the north and south. As such, a macro grading plan has been created to confirm that the site can be graded in accordance with these boundary conditions. The report notes that grade raise restrictions, on-site conditions and proposed infrastructure may necessitate that a portion of the property require a surcharge program, the use of lightweight fill and/or alternative construction measures.

The report concludes that while some infrastructure already exists, the development plan will include the expansion and extension of the infrastructure to service the subdivision. Both the existing and proposed infrastructure has been deemed suitable to service the proposed subdivision. Adherence to the provided Sediment and Erosion Control Plan during construction will minimize potentially harmful impacts on surface water.

3.1.3 Environmental Noise Impact Assessment

The Environmental Noise Impact Assessment report summarizes potential impacts of roadway traffic noise and stationary noise on the proposed development and identifies potential noise control measures.

The report indicates that the development will be impacted by traffic noise from future Greenbank Road and Interior Collector Road 1 (identified as Street 1 on the Draft Plan). Traffic noise from Cambrian Road is not anticipated to impact the proposed development as it is located a substantial distance from the proposed subdivision. The study identifies the neighbouring aggregate pits to the south as a stationary source of noise. The Mineral Resource Impact Assessment will analyze the noise impacts from the sand and gravel pits as part of Phase 2 of the study.

The study identifies traffic noise contours for indoor and outdoor sound levels. Where required, indoor sound levels can be mitigated by central air conditioning, forced air heating systems, screening, and an acoustical review/design of building components. Outdoor sound levels are proposed to be mitigated with noise barriers in specific locations. Warning clauses are also recommended to be included in an Agreement of Purchase and Sale for some dwelling units.

In summary, the report demonstrates that roadway noise impacts can be adequately mitigated.

3.1.4 Geotechnical Study

The Geotechnical Investigation was prepared to determine subsoil and groundwater conditions for the site and provide geotechnical recommendations for the design of the proposed development. The field investigation took place in January of 2018.

Generally, the soil conditions encountered consist of a thin layer of topsoil/organic layer followed by a layer of silty sand overlying either a sensitive silty clay deposit or a compact to dense glacial till and/or a loose, brown

silty fine sand. Based on available geological mapping, dolomite of the Oxford formation is present in this area with an overburden drift thickness ranging between 15 to 25 m.

The groundwater level varies between 0.20 to 3.15 metres depth. It should be noted that groundwater levels are subject to seasonal fluctuations; therefore, the groundwater level could vary at the time of construction. Methods of reducing impacts on the long term groundwater level include placing clay dykes in the service trenches, reducing the size of paved areas, leaving green spaces to allow for groundwater recharge or limiting planting of trees to areas away from buildings. During the construction phase, it is anticipated that dewatering will occur.

Due to the presence of silty clay, the proposed development will be subjected to grade raise restrictions. The report recommends a grade raise limitation of up to 1.0 metres for the northern portion of the site and unlimited grade raise for the remainder. Based on groundwater level observations, a sub-floor drain system for the proposed buildings with basements is recommended.

Paterson completed a soils review of the site to determine applicable tree planting restrictions in order to prevent possible foundation damage and groundwater impacts. Based on the results of the review, two tree planting setback areas are present within the subdivision area (Area 1 and Area 2). Area 1 makes up the southern portion of the site and requires no tree planting setbacks. Area 2, where low to medium sensitivity clay was encountered within the northern areas of the site, requires tree planting setbacks as outlined in the report.

Overall, the subject site is suitable for the proposed subdivision development from a geotechnical perspective, provided the recommendations within the report are adhered to.

3.1.5 Hydrogeological Assessment

The Hydrogeological Assessment identifies the following potential impacts:

- Impacts to adjacent structures: Impacts to adjacent structures related to ground surface settlement due to groundwater removal during construction is anticipated to be minimal given that excavation is expected to be short in duration for the development proposed and the fact that the majority of the site is surrounded by undeveloped land.
- Impacts to neighbouring water wells: The report indicates that there are eleven (11) wells within 500 metres of the subject property. All of the identified wells are no longer in use. As adjacent lands are serviced with municipal services, it is unlikely that additional wells will be drilled in the area. Construction activities on the site are therefore not expected to interfere with the water supply of adjacent properties. The report states that a long-terms groundwater monitoring program is not required.
- Groundwater: It is anticipated that material on site will be disposed of or reused in accordance with provincial policies. All groundwater that is pumped from site excavations must be managed in an appropriate manner through a water management program.

3.2 Planning Studies

3.2.1 Planning Rationale

Fotenn Consultants prepared a Planning Rationale in support of the Plan of Subdivision, and Zoning By-law Amendment applications in April 2018. The rationale provides a history of the applications affecting the subject property and provides an analysis of the applicable policy and regulatory framework. The Rationale also provides a description of the proposed development, similar to the summary provided in Section 2 above.

The document identifies that the required planning applications are a Plan of Subdivision application and a Zoning By-law Amendment application. The Zoning By-law Amendment seeks to re-zone the property from Development Reserve (DR) and Mineral Aggregate Resource (MR) to zones that would permit the residential, open space and institutional uses proposed for the area.

Overall, the proposed development conforms to the general intent of General Urban Area Official Plan designation and advances the City's strategic initiatives. The development also implements the Barrhaven South Community Design Plan which envisions a mix of residential, parks and schools for the lands. Further, the report addresses the OP designations relating to the Sand and Gravel area located south of the property.

3.3 Environmental Studies

3.3.1 Stage 1 Archaeological Assessment

The Stage 1 Archaeological Assessment was prepared for the Meadows Phase 5 & 6 Subdivision in February 2018. The Stage 1 Assessment concluded that the archaeological potential of the subject property has both pre-contact Aboriginal as well as historic Euro-Canadian archaeological potential. The assessment notes that pre-contact potential is moderate to high based on a number of factors. Furthermore, there is high archaeological potential for historic period sites given that the property was occupied from the mid nineteenth century. The report ultimately recommends that a Stage 2 assessment be undertaken, which will occur in summer 2018.

3.3.2 Phase I Environmental Site Assessment

The purpose of the Phase I Environmental Site Assessment (ESA) is to determine whether there are any environmental concerns that could impact the development of the lands. According to historical records, the subject site and surrounding properties have historically been vacant or used for agricultural or aggregate extraction. More recently, development has occurred around the site (primarily residential), and there are two operational sand pits south of the site.

Based on the analysis of historical records, no potentially contaminating activities (PCAs) were identified on the property. The test holes excavated by Paterson Group did not reveal the presence of contamination or deleterious fill. Based on the results of the Phase 1 ESA, it was determined that a Phase 2 ESA is not required.

3.3.3 Environmental Impact Statement and Tree Conservation Report

An Environmental Impact Statement (EIS) and Tree Conservation Report (TCR) were prepared by Muncaster Environmental Planning Inc. The report addresses the existing vegetation, potential tree retention, Species at Risk and other natural features, including the woodlands which are mapped as part of the Natural Heritage System. The major objective of the study is to assess potential impacts on the natural features and functions of the subject site and surrounding area.

Upland Poplar Deciduous Forest was identified in the east and northwest portions of the site. Much of this area was not treed in 1976 and wind throw was extensive in many areas of the deciduous forest. The ground flora of the deciduous forest reflects disturbed conditions. Upland White Cedar Coniferous Forest was identified in the central areas of the site. Wind throw was also extensive within this area of the site. The understory was limited by the thickness of the cedar stems in many areas of the forest. Pockets of cultural meadows and thickets are found throughout the subject property. The cultural meadows include regenerated ground vegetation species, some woody vegetation, and regenerating poplar and ash stems. Areas with tree coverage of less than 60% are identified as cultural woodlands, which are scattered throughout the site. Areas of wetland habitat have developed in some of the former aggregate areas, with standing water a common feature.

The northwest portion of the site is directly adjacent to the Cambrian Road Woodlot acquired by the City of Ottawa. Thera are no natural areas to the south, west, or east of the site as the adjacent lands are largely comprised of lands for aggregate extraction, Highway 416 and residential development in Barrhaven South. As such, the subject lands do not perform a significant linkage function.

No Species at Risk were identified within the subject site and adjacent areas. One provincially rare fish species, greater redhorse, was identified approximately three (3) kilometres to the east of the site. No suitable aquatic

habitat is located on or adjacent to the site for this species. The site does not possess habitat suitable for any of the Species at Risk identified as possibly being located within the area, with the exception of Butternut trees. No Butternut trees were observed during the field survey; however, the report proposes that another subsequent review take place during the late spring.

The significant woodlands on and adjacent to the site are the only natural heritage features noted for the site. The on-site forests have a reduced function due to their relatively young age, extensive non-native flora, lack of forest interior habitat, historical logging and extensive wind throw. Removal of the disturbed on-site forests will not impact the ability of the overall contiguous forest to the north-west to function as a significant woodland. The report outlines a number of important mitigation measures to protect the adjacent woodlands, including:

- Locating the park adjacent to the woodlot and retaining trees along the north and west edges of the parkland;
- Avoiding groundwater lowering in the northwestern portion of the site, which is not anticipated based on the soil profile and anticipated grading. Development is anticipated to occur well above the existing groundwater table;
- Planting native species, sourced from local seed sources;
- Avoiding the planting of trees and shrubs with high water demands in clay soils and limiting planting of trees in proximity to buildings, in accordance with recommendations provided in the Geotechnical Investigation;
- Placing clay dykes in service trenches, reducing the size of paved areas, and leaving green spaces open to maximize groundwater recharge will mitigate direct impacts to the long-term groundwater level and indirect impacts to the woodlands to the northwest of the site;
- Installing silt fencing along the perimeter of work areas to provide sediment and erosion control, protect the adjacent vegetation and keep wildlife out of the work area;
- Removing any at-risk wildlife prior to site disturbance;
- Removing woody vegetation outside of the timeframe of April 15th to August 15th to protect breeding birds;
- Adhering to the City's Protocol for Wildlife Protection during Construction;
- Checking the work areas for wildlife prior to beginning work each day;
- Pumping any removed groundwater into a proper filter mechanism prior to release into the environment;
- Keeping the extent of exposed soils to a minimum at all times;
- Utilizing sediment and erosion controls during construction, such as seepage barriers in temporary drainage ditches and around disturbed areas;
- Following municipal by-laws for noise; and,
- Managing waste in accordance with provincial regulations.

3.3.4 Mineral Resource Impact Assessment

A Mineral Resource Impact Assessment (MRIA) was prepared by Paterson Group to evaluate the potential for land use impacts relating to compatibility between the proposed residential uses and adjacent mineral aggregate resource operations. The Provincial Policy Statement advises that mineral aggregate resources are to be protected.

As mentioned, an active sand and gravel pit (the Costello Pit) is located to the south of the subject property. The aggregate property consists of approximately 79.5 acres and has frontage on Borrisokane Road. The Category 1 license for the aggregate extraction allows for extraction to an elevation below the water table, which is anticipated to continue for another 5 to 7 years.

The Operational Standards Section of the Aggregate Resources of Ontario: Provincial Standards sets excavation setbacks for licensed mineral aggregate operations. The Category 1 license requires a setback of 15 metres from the boundary of the pit operation along the south border of the proposed plan of subdivision. This setback is applied to the aggregate lands and not to the proposed plan of subdivision lands.

The MRIA analyses compatibility of the residential and mineral aggregate uses based on a number of parameters as follows:

- Noise: The Costello Pit is identified as a stationary noise source. It is assumed that the Costello Pit will not be operational in the evening, so stationary noise analysis will focus on the daytime only. It is anticipated that if the stationary noise exceeds the limitations for indoor noise levels, that noise levels can be buffered using appropriate building materials and installation of central air conditioning units. These recommendations will be included in a Phase 2 study which include an analysis of stationary noise impacts. In terms of outdoor living areas, it is anticipated that noise levels will exceed the 50 dBA limit for outdoor living areas at a distance of 15 metres from extraction equipment. As already noted, the closest the extraction equipment will be to the proposed residential uses is 15 metres from the rear yards of units along the southern boundary of the subject property; therefore, noise attenuation barriers are proposed along the rear yards of the units, as shown in the IBI Noise Report.
- Traffic: The operation currently utilizes Borrisokane Road as the truck route and it is anticipated that this will continue until the extraction is completed. As the subdivision will be accessed from Mattamy Half Moon Bay West and, in the future, realigned Greenbank Road, there are no anticipated traffic conflicts with the continued operation of the Sand and Gravel pit.
- Dust: Provincial standards require that pit operations are responsible for maintaining dust emissions. Discussions with the Costello Pit owner revealed that dust control on haul roads and processing areas is regularly conducted using a water suppressant. No other dust mitigation measures are proposed. Similarly, the proposed plan of subdivision will require the use of a water suppressant to manage dust during construction.
- Vibration: It is understood that current and future operations of the Costello Pit will not require blasting for excavation purposes. As such, vibration is limited to hauling and excavation equipment only which will have a minimal impact on the proposed residential subdivision. Similarly, there are no anticipated vibration impacts from the proposed plan of subdivision to the Sand and Gravel pit.
- Groundwater: The proposed plan of subdivision is intended to be connected to municipal water service such that impacts to groundwater levels will be minimal. The aggregate extraction is expected to be completed below the groundwater table via dredging techniques. The operation is not anticipated to adversely impact groundwater levels within the plan of subdivision area.

The report concludes that the proposed plan of subdivision will not negatively impact the current and future operation of the Sand and Gravel Pit. Similarly, the continued operation of the pit is not anticipated to negatively impact the proposed residential development, provided all proposed mitigation measures are adhered to.

4.0 POTENTIAL CONCERNS, MITIGATION MEASURES AND IMPLEMENTATION

4.1 Potential Concerns

The various studies prepared in support of the development applications, as summarized in Section 3 above, have each described existing environmental conditions and identified potential environmental effects related to the proposed development. As required in Section 4.7.1 of the Official Plan, the scope of environmental interactions between studies is summarized in Table 1 below.

Table 1: Environmental Interactions between Technical Studies

	Aadequacy of Public Services	Community Transportation Study	Geotechnical Study	Environmental Noise Impact Assessment	Planning Rationale	Tree Conservation Report	Phase I Environmental Site Assessment	Environmental Impact Statement	Stage 1 Archaeological	Mineral Resource Impact Assessment
Noise & Vibration				X	X			X		X
Groundwater	X		X			X		X		
Surface Water	X					X		X		
Terrestrial Ecology						X		X		
Geotechnical	X		X			X		X		X
Services	X		X							

4.2 Mitigation Measures and Implementation of Commitments

4.2.1 Protection of Vegetative Cover

Anticipated Effects

The on-site forests have a high level of historical disturbance as a result of previous aggregate extraction, previous agricultural uses, wind throw, and logging. The removal of the wooded areas will not impact the ability of the overall contiguous woodland located to the north-west to function as a natural area.

Indirect impacts to the woodlot can occur via a lowering of the groundwater table.

Required Mitigations

While the removal of trees is not anticipated to negatively impact the features and function of the Cambrian Woodlot, in order to ensure an adequate buffer to the woodlot, the required parkland has been located directly adjacent to it. While it is not anticipated that the majority of the site will retain trees, it is expected that tree retention can occur along the north and west boundaries of the park. It is further anticipated that new, native trees will be planted throughout the subdivision in accordance with the recommendations of the EIS/TCR and Geotechnical Investigation in order to replace vegetative cover removed during the construction of the development.

It is not proposed that significant groundwater lowering will occur within the northwestern area of the site, which will minimize impacts to the adjacent woodlot. Furthermore, by placing clay dykes in service trenches, reducing the size of paved areas, and leaving green spaces open to maximize groundwater recharge, long-term groundwater impacts can be mitigated.

A number of mitigation methods during the construction phase of the project are proposed in the Environmental Impact Statement and Tree Conservation Report to protect future vegetative cover and existing vegetative cover of adjacent lands.

4.2.2 Erosion Prevention and Protection of Surface Water

Anticipated Effects
Although there are no surface water areas located on-site, existing watercourses on adjacent lands and conveyance systems can be exposed to sediment loading during construction, resulting in potential exposure of fish and amphibian habitat to deleterious materials.

Required Mitigations
In order to prevent site generated sediments from entering the environment, an Erosion and Sedimentation Control Plan (ESCP) will be developed and implemented by the Owner's general contractor prior to development. The erosion and sedimentation control strategy for the subject site could include erection of silt fences, straw bale barriers, rock check dams, and the installation of bulkhead barriers at the nearest existing downstream manholes. The potential Erosion and Sedimentation Control Plan has been included as an appendix to the Assessment of Adequacy of Public Services report.

4.2.3 Protection of Endangered and Threatened Species

Anticipated Effects
No Species at Risk were observed on the site; however, another review is recommended for late spring to confirm that there are no Butternut trees located on the lands. Furthermore, there were no significant wildlife habitats identified in the study area.

The lands are highly disturbed and do not represent a significant wildlife habitat area. It is anticipated that wildlife using the lands will relocate to the Cambrian Woodlot.

Required Mitigations
It is recommended that a further Butternut survey of the study area be conducted. As no negative impacts are anticipated for Species at Risk, no specific mitigations beyond the typical wildlife protection standards during construction are proposed. These standards include:

- The work area is to be thoroughly searched for any wildlife at risk including turtles and snakes, and these animals are to be relocated to the Environmental Protection lands to the north;
- Relocate animals only far enough to ensure their immediate safety;
- To protect breeding birds, the vegetation should not be removed between April 15th and August 15th;
- Waste will be managed at all times; and,
- The construction site will continue actively surveying the site for Species at Risk and construction will follow the City's Protocol for Wildlife Protection during Construction.

4.2.4 Protection of Groundwater Resources and Geotechnical Considerations

Anticipated Effects
The pre-construction groundwater depth on site is observed to range between 0.2 and 3.15 metres in January 2018. A post-development groundwater lowering of 0.5 metres is assumed; however, this is not anticipated in the north-west area of the site which could potentially impact the adjacent woodlot.

There are no anticipated impacts to adjacent structures given the duration of excavation proposed for the development and no anticipated impacts to neighbouring wells and water supply given that all nearby wells are no longer in use and the area is generally serviced with municipal services.

Required Mitigations
Efforts will be made to reduce the impact of the development on the long-term groundwater level and differential settlements by placing clay dykes in the service trenches reducing the sizes of paved areas, leaving green spaces to allow for groundwater recharge or limiting planting of trees to areas away from the buildings. However, it is not economically possible to control the groundwater level. Any removal of groundwater will require the water to be pumped into a proper filter mechanism prior to release to the environment to mitigate any adverse impacts. It is recommended that the contractor manage groundwater pumped from site excavations appropriately through a water management program.

Due to the presence of the clay layer, the proposed development is subjected to grade raise restrictions up to 1 metres as noted on the permissible grade raise plan. Based on this, there are several options to accommodate the grade raises such as the use of lightweight fill and, alternatively, preloading or surcharging the subject site in localized areas to achieve the desired settlements.

4.2.5 Noise and Vibration

Anticipated Effects
The development of the property near a main arterial roadway and mineral extraction site create noise and vibration issues for the proposed residential development. Furthermore, construction noise can create negative impacts to wildlife,

Required Mitigations
Efforts will be made to reduce the impact of noise and vibration from traffic noise and adjacent aggregate extraction operations by way of noise barriers and building design.

To mitigate indoor sound levels, a noise contour has been identified flanking Street 1 and future Greenbank Road. Based on the observations, specifically buildings flanking future Greenbank Road will exceed the 65 dBA noise levels. Between the identified noise contours, a forced air heating system with central air conditioning is required with a warning clause to mitigate the sound levels from the road. Building in the noise contours flanking Street 1 will required a warning clause and appropriate building materials to circumvent the noise disturbances. Phase 2 of the Mineral Resource Impact Assessment will determine the limit of impacts of noise from the adjacent Costello Pit to the south. It is anticipated that indoor noise levels to the affected units can be mitigated by the same measures mentioned in the IBI report and discussed above.

To mitigate outdoor sound levels, the report notes that physical attenuation will be required for noise in outdoor living areas. For areas above the 60dBA levels, notably along future Greenbank Road, a noise barrier and a warning clause will be used to mitigate street noise disturbances. For dwelling units beyond the 60dBA but within the 55dBA contour, a warning clause will be included. Noise barriers will be likely required at four locations in the plan of subdivision, which are identified in the IBI report. The southern noise attenuation barriers are anticipated to be required following an analysis of stationary noise from the Costello Pit in order to reduce noise levels for outdoor living areas in accordance with provincial requirements.

Construction of the subdivision must adhere to all municipal noise by-laws to be sensitive to wildlife in adjacent natural areas.

4.2.6 Mineral Resources

Anticipated Effects

The MRIA identifies potential noise and dust impacts to the subject property. Impacts relating to traffic, vibration, and groundwater are anticipated to be minimal.

Required Mitigations

Required mitigations include noise attenuation barriers, forced air heating systems, central air conditioning, and warning clauses.

5.0
DESIGN WITH NATURE PRINCIPLES AND SUBDIVISION DESIGN

As outlined in Section 4.7.1(2) of the Official Plan, subdivision design is required to include a statement with respect to how the design with nature approach has influenced the design of the development and how it supports the following environmental objectives:

- Increasing forest cover across the city;
- Maintaining and improving water quality;
- Maintaining base flows and reducing peak flows in surface water;
- Protecting and improving the habitat of fish and wildlife in stream corridors;
- Protecting springs, recharge areas, headwater wetlands and other Hydrogeological areas;
- Managing resources by using low-maintenance, natural solutions.

Section 8 of the City of Ottawa Official Plan defines design with nature as:

An approach that utilizes natural methods during site design to work with the terrestrial, aquatic, and biological characteristics of the site and the relationship between them. These measures may serve to reduce the reliance on technological solutions, which may be expensive, energy- or management-intensive, and less environmentally sensitive. This may include:

- Retention of natural vegetation on slopes to reduce erosion;
- Conservation of as many existing trees as feasible;
- Use of appropriate natural infiltration techniques on site to reduce the need for stormwater management ponds;
- Orientation of streets to maximise opportunities for passive solar heating and reflection of natural contours;
- Protection of natural stream corridors and incorporation of natural features into open spaces.

The proposed development response to these principles and objectives as follows:

- Trees to be removed will be replaced where possible within the proposed rights-of-way in consideration of the setbacks proposed in the Geotechnical Report. Plantings will consist of native species and will contribute positively to an appropriate amount of vegetative cover within the Plan of Subdivision.

- The Woodlot is located on the City-owned property to the north-west. The proposed neighbourhood park has been strategically located to provide a buffer to the woodlot. The park design will enhance the woodlot and it is anticipated that trees can be retained within the parkland area, adjacent to the woodlot.

- Stormwater from the site will be directed via storm sewers to the Clarke stormwater management pond which will provide enhanced water quality and quantity control. Ultimately, stormwater will be directed to the Jock River, but will be controlled through the stormwater management system envisioned by the Master Servicing Study and implemented through the design of the various subdivisions in the Barrhaven South area.

- Through detailed design, opportunities to reduce the size of paved areas and leave green spaces open will be maximized in order to allow for groundwater recharge. This is anticipated to avoid potential indirect impacts to the neighbouring woodlot.

6.0 ENERGY EFFICIENCY AND SUSTAINABLE DESIGN

Section 2.5.1 of the Official Plan sets out design objectives and principles for new development within the City of Ottawa. The design objectives are qualitative statements of how the City wants to influence the built environment as the city matures and evolves. They are broadly stated, and are applied throughout all land use designations. The Design Principles are more specific, further describing how the City hopes to achieve each of the objectives.

As per Section 4.7.1 of the Official Plan, an Integrated Environmental Review Statement is required to consider Objective 7 and the associated principles. Objective 7 and its associated principles are:

To maximize energy-efficiency and promote sustainable design to reduce the resource consumption, energy use, and carbon footprint of the built environment.

Principles:
Design should:

- Orient development to maximize opportunities for passive solar gain, natural ventilation, and use energy efficient development forms and building measures.
- Consider use of renewable energy and alternative energy systems.
- Maximize opportunities for sustainable transportation modes (walking, cycling, transit facilities and connections).
- Reduce hard surfaces and maximize landscaping and site permeability on site.
- Consider use of innovative green spaces such as green roofs, and measures that will reduce the urban heat island effect.
- Maximize re-use and recycling of resources and materials.
- Utilize green building technologies and rating systems such as Leadership in Energy and Environmental Design (LEED).
- Utilize advanced water conservation and efficiency measures.

The proposed development has implemented efficient and sustainable design principles as follows:

- The proposed development will provide a mix of housing in the Barrhaven South Community, in proximity to Rapid Transit, providing residents easy access to transit and giving them the opportunity to live in proximity to work and to shop locally.

- The plan implements the vision of the Barrhaven South Community Design Plan in the creation of a public park, along with providing a buffer to the Woodlot in proximity to the site.

- The development is maximizing opportunities for reduction of hard surfaces and increasing landscaping by proposing open space as well as fields associated with the school block. Furthermore, landscaping on properties will contribute to this permeability.

- The proposed development will develop vacant lands within the City's urban boundary, making use of existing infrastructure and public service facilities.

7.0 CONCLUSION

7.1 Concurrence of Study Team

This Integrated Environmental Review Statement has been reviewed and concurred with by the individual sub-consultants involved in the design team and preparation of technical studies, and by Tamarack (Nepean) Corporation. Confirmation from each of the team members is included in Appendix A.

7.2 Conclusion

It is our professional opinion that this Integrated Environment Review Statement follows the policies set out in the Official Plan. We trust that this report is to your satisfaction. Should you have any questions, please do not hesitate to contact the undersigned.

Emilie Coyle, M.PL
Planner

Stephanie Morris-Rashidpour, MCIP RPP
Senior Planner

APPENDIX A: CONCURRENCE OF STUDY TEAM

IBI Group

I have reviewed the sections of this Integrated Environmental Review Statement associated with the **Assessment of Adequacy of Site Services**, **Community Transportation Study, and Environmental Noise Study** as it relates to the proposed development of The Meadows Phase 5 & 6 by Tamarack Corporation and concur with its related content and recommendations.

Servicing:

Date: May 3/2018

Signature: _____

Terry Brulé, P. Eng.
Associate, Manager Land Engineering
IBI Group

Transportation:

Date: May 3, 2018

Signature: _____

Austin Shih, P. Eng.
IBI Group

Noise Study:

Date: May 3, 2018

Signature: _____

Lance Erion, P. Eng.
IBI Group

Paterson Group

I have reviewed the section of this Integrated Environmental Review Statement associated with the **Geotechnical Investigation, Mineral Resource Impact Assessment, Stage 1 Archaeological Assessment** and **Phase 1 Environmental Site Assessment,** as it relates to the proposed development of The Meadows Phase 5 by Tamarack Corporation.

Geotechnical and Mineral Resource Impact Assessment

Date: 2018/05/03

Signature:

David J. Gilbert, P. Eng.
Associate and Senior Engineer
Paterson Group

Archaeological

Date: 2018/05/03

Signature:

Ben Mortimer, M.A., A. P. A,
Senior Archaeologist
Paterson Group

Environmental

Date: 2018/05/04

Signature:

Mark S. D'Arcy, P.Eng., Q.P.ESA
Associate and Senior Engineer
Paterson Group

Muncaster Environmental Planning Inc.

I have reviewed the section of this Integrated Environmental Review Statement associated with the **Environmental Impact Statement and Tree Conservation Report**, as it relates to the proposed development of The Meadows Phase 5 by Tamarack Corporation.

Date: May 3, 2018

Signature: 

Bernie Muncaster, M.Sc.
Principal
Muncaster Environmental Planning Inc.

Tamarack (Nepean) Corporation

I have reviewed and concur with the content and recommendations of this Integrated Environmental Review Statement.

Date: May 3, 2018

Signature:

Michelle Taggart
Director of Planning and Development
Tamarack Homes and Taggart Investments