

## Tree Protection and Management Plan 3054 Homestead Drive, 9166 Airport Road, and 9175 Airport Road

Hamilton, Ontario

#### Submitted to:

Fengate Asset Management 2275 Upper Middle Road East, Suite 700 Oakville, Ontario L6H 0C3

#### Submitted by:

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Updated February 2023 Project 2100017

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### 1. Introduction

GEI Consultants Ltd. (GEI) was retained by Fengate Homestead Holdings LP to complete a tree inventory and prepare a Tree Protection and Management Plan for the properties located at 3054 Homestead Drive, 9175 Airport Road, and 9166 Airport Road in the City of Hamilton, Ontario (collectively referred to herein as the Subject Lands). The Subject Lands are generally located north of Airport Road, west of Homestead Drive, east of John C. Munro Hamilton International Airport, and south of Dickenson Road within the Twenty Mile Creek watershed (**Figure 1**, **Appendix A**).

It is GEI's understanding that the Subject Lands will accommodate commercial development within the Airport Employment Growth District (AEGD) Secondary Plan (OPA 35). The AEGD has been designed to provide business park development to integrate and complement the existing John C. Munro Hamilton International Airport (herein referred to as the Airport Lands). The proposed development includes a complex of four commercial buildings and associated parking lots and one street (**Figure 2**, **Appendix A**). A created wetland will be constructed on the eastern portion of the Subject Lands near the existing adjacent residences.

GEI completed a tree inventory within the Subject Lands over multiple years, as properties were added into the Subject Land boundary: 3054 Homestead was surveyed in 2021, 9175 Airport Road was surveyed in 2022, and 9166 Airport Road was surveyed in 2023. This Tree Protection and Management Plan presents the results of the tree inventory, identifies opportunities for tree preservation and protection, recommends measures to protect preservation trees, and proposes compensation for tree removals. The objective of the Tree Protection and Management Plan is to retain existing tree cover wherever feasible and to minimize the risk of injury to trees identified for protection. The preparation of this Tree Protection and Management Plan was guided by the City of Hamilton's *Tree Protection Guidelines* (2010).

## 2. Methodology

GEI completed the tree inventory at 3054 Homestead Drive on September 8, October 14, and October 15, 2021. The tree inventory at 9175 Airport Road was completed on June 22, 2022. A final site visit was conducted on January 31, 2023 to inventory the trees at 9166 Airport Road. Trees with a diameter-at-breast-height (DBH) of 10 cm and greater within the Subject Lands were tagged and assessed. Trees within two of the three woodlands (as shown on **Figure 3**, **Appendix A**) and on adjacent lands were assessed but not tagged. Woodland and neighbour trees were assigned a unique identifier beginning with W and N, respectively, for mapping and reference purposes. The locations for all inventoried trees on the Subject Lands were recorded in UTM coordinates using a sub-meter capable GPS unit. The following information was recorded for each tree: species, DBH, health category (biological, structural, and overall), and notes regarding the assigned health category.

Tree health was categorized as good, fair, or poor. Trees categorized as "good" overall had at least 80% live canopy and showed no significant structural defects (e.g., weak limbs, girdling roots, stem lean) or evidence of biological damage (e.g., insect damage, fungal growth, leaf dieback). "Fair" trees were those with 50% to 80% live canopy and showed no significant structural or biological defects, or the tree had over 80% live canopy but did show some evidence of structural defects and/or biological damage. Trees categorized as "poor" were those with less than 50% live canopy and/or had significant structural defects and/or biological damage.

## 3. Tree Inventory

A total of 444 trees were mapped and assessed during this tree inventory, including two dead trees (**Figure 3**, **Appendix A**). All inventoried trees were located on private lands; no municipal trees were identified during this tree inventory.

**Table 1** (**Appendix B**) outlines the results of the tree inventory, including the tree identification number, species, DBH, crown radius, health category (biological, structural, and overall), notes regarding the assigned health category, recommendations for preservation or removal, rationale for tree removal, tree ownership, and the size of the Tree Protection Zone (TPZ) for preservation trees. GEI and City of Hamilton Forestry Staff have agreed to defer inclusion of grading and utilities information until detailed design. This Tree Protection and Management Plan will be updated once that detailed information is available.

The inventoried trees included 19 different species, including one hybrid and one that could only be identified to genus. Of the 442 live inventoried trees, 265 (60%) are native to the Hamilton Conservation Authority and Conservation Halton watersheds (HCA 2014).

Two Hybrid Butternut (*Juglans cinerea x Juglans ailantifolia*), as confirmed through DNA testing (see **Appendix C**), were inventoried. Therefore, these trees are not afforded any protections under the *Endangered Species Act, 2007*.

#### 3.1 Preservation Trees

Preservation trees are those that are unlikely to be significantly impacted by the proposed construction or can likely be preserved using tree protection measures, as described in **Section 4**. Of the 444 inventoried trees, 20 are preservation trees.

#### 3.2 Removal Trees

Removal trees are those that are located within the proposed construction footprint and cannot be preserved. Of the 444 inventoried trees, 424 are removal trees (including two dead trees). Compensation for removal trees is discussed in **Section 5**.

The tree inventory noted several private trees on or near the property boundary, slated for removal. Permission is required from both landowners prior to the removal of trees located on the property boundary. Ownership of these trees can only be determined through a legal survey completed by an Ontario Land Surveyor.

The proponent should ensure that the works are in conformance with the *Migratory Birds Convention Act, 1994* and the *Endangered Species Act, 2007*. Specifically, tree removals should comply with timing window restrictions with regards to the protection of nesting birds (April 1 to August 31) and Species at Risk bats (April 1 to September 30). Where these timing windows cannot be avoided, it is recommended that a qualified ecologist conduct a nest search and bat habitat assessment.

## 4. Tree Protection and Management Plan

Tree preservation will be achieved through avoidance and/or the use of appropriate tree protection measures. GEI inventoried 444 trees within the Subject Lands. Of these, 20 are preservation trees. The proposed Tree Protection and Management Plan is described in the following subsections.

#### 4.1 Tree Protection Zones

The area of protection around a tree is referred to as the TPZ and is measured outward from the trunk. The TPZ was determined in accordance with the City of Hamilton's *Tree Protection Guidelines* (2010). The width of the TPZ corresponds to the crown radius (dripline) plus one meter.

The TPZs must be fenced off to prevent physical damage to the tree and compaction of the soil, as described in the *Tree Protection Guidelines*. The TPZ must remain fully intact throughout all phases of construction and cannot be used for the temporary storage of fill, topsoil, building materials, equipment storage, washing of equipment, or dumping of any construction debris. Tree protection fencing will provide protection to the individual trees and clumps of trees, as shown on **Figure 3** (**Appendix A**). Page wire farm fencing shall be the standard form; snow fencing is not acceptable. Signage must be posted in visible locations on each tree protection fence and must clearly state that the barrier delineates the TPZ. Tree protection measures for preservation trees must follow the City of Hamilton's Tree Preservation Details, included in **Appendix D**.

A Verification of Tree Protection Letter is to be prepared by a recognized tree management professional (i.e., certified arborist, registered professional forester, or landscape architect) to ensure that all tree protection measures have been implemented. This correspondence is to be provided to the Director of Planning prior to the start of any on-site works.

#### 4.2 Protection of Preservation Trees

The objective of the TPZ is to maximize protection of the tree to ensure its long-term survival. It is recognized, however, that encroachment into the prescribed TPZ may at times be deemed necessary to facilitate construction. Some healthy trees are known to withstand construction impacts such as root cutting, soil compaction, and soil saturation; however, these individual responses are dependent on the species, site condition, and degree of impacts (Matheny & Clark 1998).

Should construction activities occur within the TPZs of some preservation trees, protection and mitigation techniques are expected to prevent these activities from impacting the long-term health of these trees. These trees would be given a modified TPZ prior to construction, which would follow the limit of construction activity. This modified TPZ will require strict adherence to the tree protection measures outlined below. If these trees cannot be adequately

protected during construction, they will be identified as removal trees and will require compensation as described in **Section 5**.

Where construction activity is proposed to occur within a TPZ, the TPZ must be properly prepared. The Project Arborist should be on site during all site alteration activities within the TPZ of live preservation trees, including tree removal, canopy or root trimming, and soil stripping, to monitor these activities and propose site-specific mitigation, where appropriate. If any accidental tree damage or encroachment into the TPZ occurs or is observed, the Project Arborist should be notified in order to take appropriate action on site. In addition, the following tree protection measures should be implemented:

- All relevant contractors should meet with the Project Arborist prior to the beginning of site alteration to review tree protection procedures.
- Low branches may be pruned back or removed to accommodate vehicular movement.
- Trees to be removed should be felled in a manner that drops the tree away from adjacent preservation trees and their TPZs.
- Any brush clearing required within the TPZs should be completed using hand-operated equipment and should be lifted out and not skidded out.
- If excavation or grading is proposed within the TPZs, affected tree roots must be cut at a 90° angle at the edge of anticipated disturbance using specialized equipment. Hydro-vac excavation will be necessary to expose the roots prior to cutting if existing conditions prevent machinery from making a clean, 90° cut.
- Tree roots damaged during construction should be exposed and cut cleanly at a 90° angle using hand operated equipment to aid in root regeneration.
- Any roots exposed for longer than four hours should be kept moist using wet mulch or burlap wrap or be directly irrigated. These affected trees should have wood mulch applied to their respective TPZs at a depth of 5–10 cm to help maintain moisture and moderate soil temperature.
- Horizontal root protection should be used in locations where regular movement of equipment through the TPZ is anticipated.
- Where construction activity is proposed to occur within or near the TPZs, irrigation should be implemented during periods of drought, especially during the summer months. A slow soaking of the entire TPZ to a depth encompassing the root system is the preferred method of irrigation, but it may vary depending on the tree species and soil texture. Water should not be directed at or near the trunks. The frequency of irrigation will depend on air temperature and precipitation at the time of construction.

 Sediment control fencing should be installed to provide a protective barrier between areas intended for stockpiling of excavated soil and candidate preservation trees. The sediment control fencing should be installed to Ontario Provincial Standard 219.130.

If preservation trees cannot be adequately protected during construction or if they exhibit canopy dieback post construction, they will be identified as removal trees and will require compensation as described in **Section 5**.

### 4.3 Post-construction Monitoring

After grading has been completed, the City of Hamilton requires that a Post-Grading Tree Maintenance Report be prepared and submitted to the Director of Planning. The Post-Grading Tree Maintenance Report will provide the following, as applicable:

- Assessment of damage to trees that were to be preserved but have inadvertently been damaged or removed by site grading and clearing;
- Identification of a dollar value for damaged trees and proposal of a compensation plan for replacing them; and
- Recommendations for preservation methods, such as root fertilization, watering, and pruning to improve the health of remaining trees.

The Post-Grading Tree Maintenance Report will be prepared following construction activities, in accordance with City of Hamilton guidelines.

## 5. Compensation Requirements

The City of Hamilton requires compensation for the removal of live private trees at a ratio of 1:1. Accordingly, a total of 422 trees are proposed to be planted as compensation for those removed through the construction of the proposed development. A Landscape Plan showing new compensation plantings will be required for submission to the Director of Planning for their review; this will be prepared during the detailed design stage. All Landscape Plans must be prepared by or under the guidance of a Landscape Architect registered as a full member in good standing with the Ontario Association of Landscape Architects and must conform to the Tree Protection and Management Plan and Site Plan. Compensation trees will be native species listed in Appendix 4 of the *Tree Protection Guidelines*. Other landscape guidelines from the City of Hamilton are as follows:

- Transplanted stock should be restricted to specimens under 20 mm DBH;
- Minimum caliper for deciduous planting stock is 50 mm DBH;
- Minimum height for a conifer is 1.5 m;
- Include a mix of tree species (no monocultures); and
- Invasive species (listed in Appendix 5 of the *Tree Protection Guidelines*) should not be transplanted.

If the required number of compensation trees cannot be accommodated on site, compensation through cash-in-lieu will be discussed with the City of Hamilton in accordance with their New Developments Tree Planting Policy.

## 6. Summary

GEI inventoried 444 trees within the Subject Lands, of which two were dead. Of the inventoried trees, 20 are recommended for preservation and 424 are recommended for removal (including two dead trees) due to predicted construction impacts. Private live tree removals require compensation at a ratio of 1:1, for a total of 422 trees proposed to be planted. If the required number of compensation trees cannot be accommodated on site, compensation through cash-in-lieu will be discussed with the City of Hamilton.

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## REFERENCES AND BACKGROUND MATERIALS

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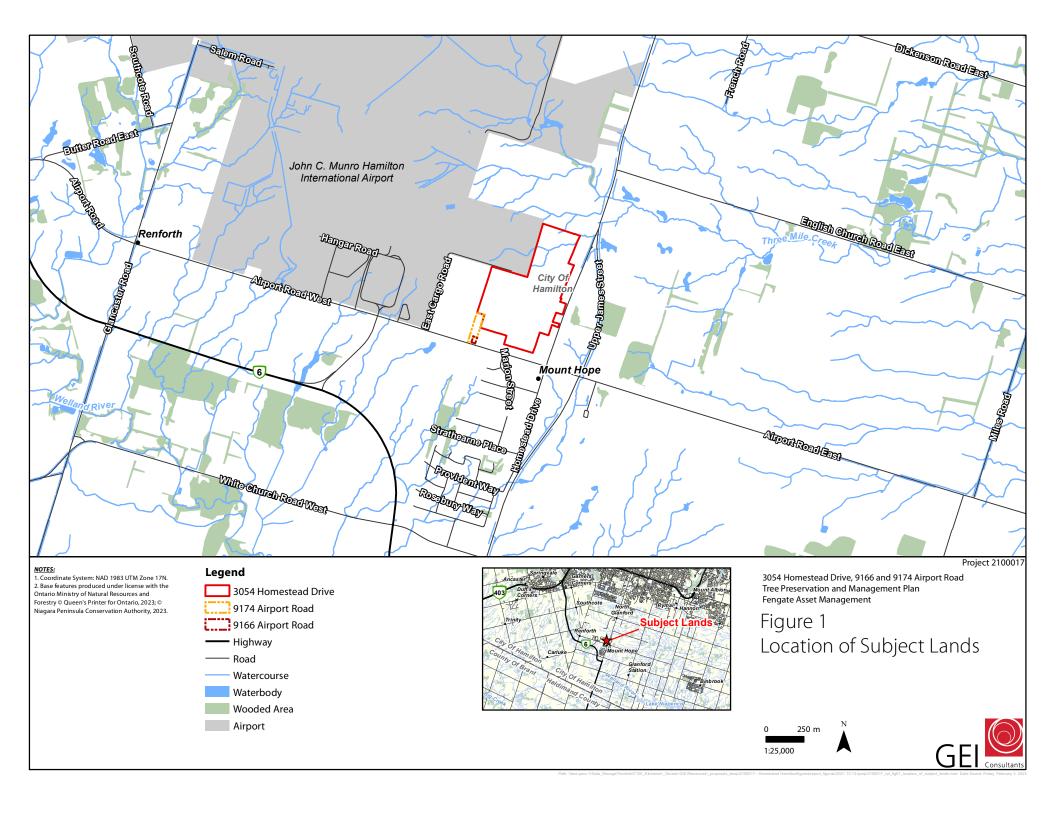
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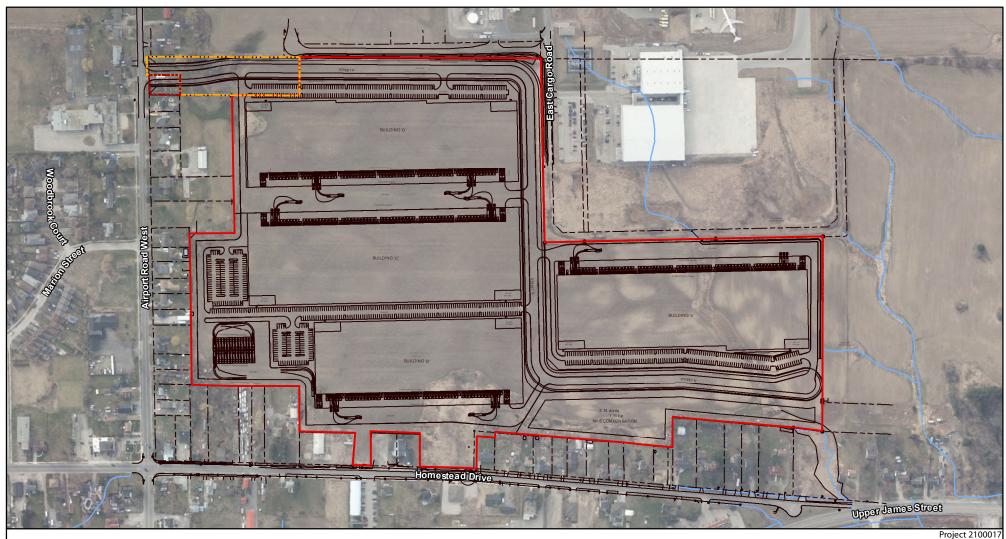
Matheny, N.P. and J.R. Clark 1998. Trees and Development: A Technical Guide to Preservation of Trees During Land Development. Denver, CO, U.S.A.: Dream Books Company.

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## Appendix A

**Figures** 





NOTES:

1. Coordinate System: NAD 1983 UTM Zone 17N.
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2023; © Niagara Peninsula Conservation Authority, 2023.
3. Orthoimagery © First Base Solutions, 2023. Imagery taken in 2019.
4. Concept Plan: '413-21-Concept Plan-2023-01-31.dwg'

#### Legend



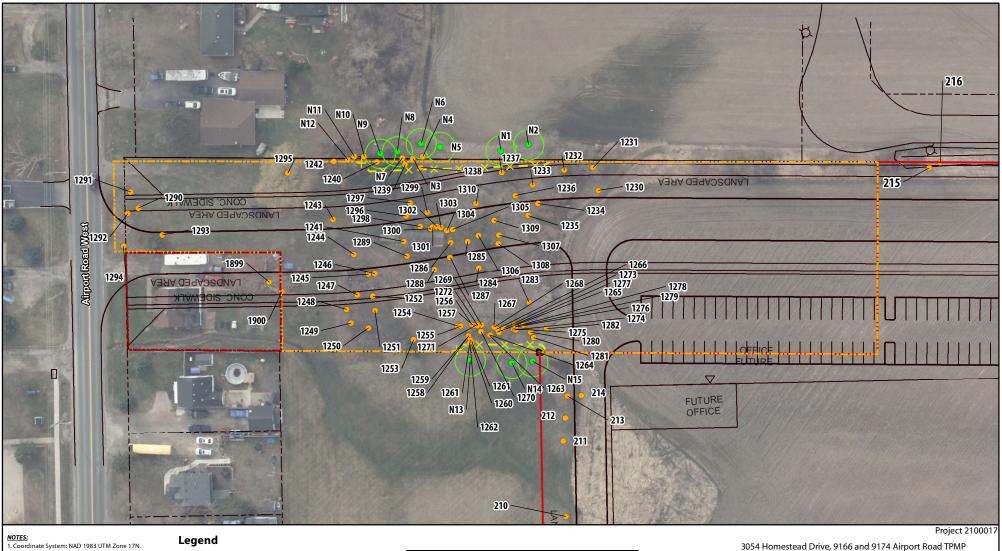
3054 Homestead Drive, 9166 and 9174 Airport Road Tree Preservation and Management Plan

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Figure 2 Concept Plan







 Coordinate System: NAD 1983 UTM Zone 17N.
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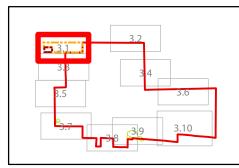
4. Concept Plan: '413-21-Concept Plan-2023-01-31.dwg' Watercourse (NPCA)

Hoarding Fence

Tree Protection Zone

#### **Tree Inventory**

- Preservation Live
- Removal Alive



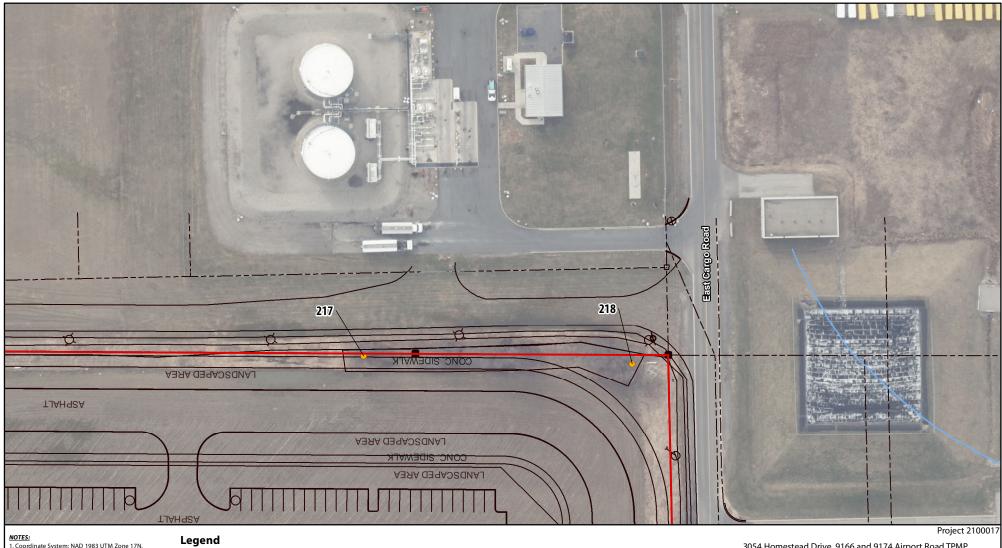
3054 Homestead Drive, 9166 and 9174 Airport Road TPMF Tree Preservation and Management Plan Fengate Asset Management

## Figure 3.1 Tree Inventory

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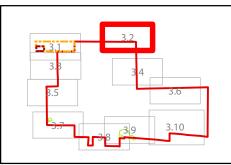
MOTES:

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4. Concept Plan: 413-21-Concept Plan-2023-01-31.dwg'

Watercourse (NPCA)

#### **Tree Inventory**

Removal - Alive

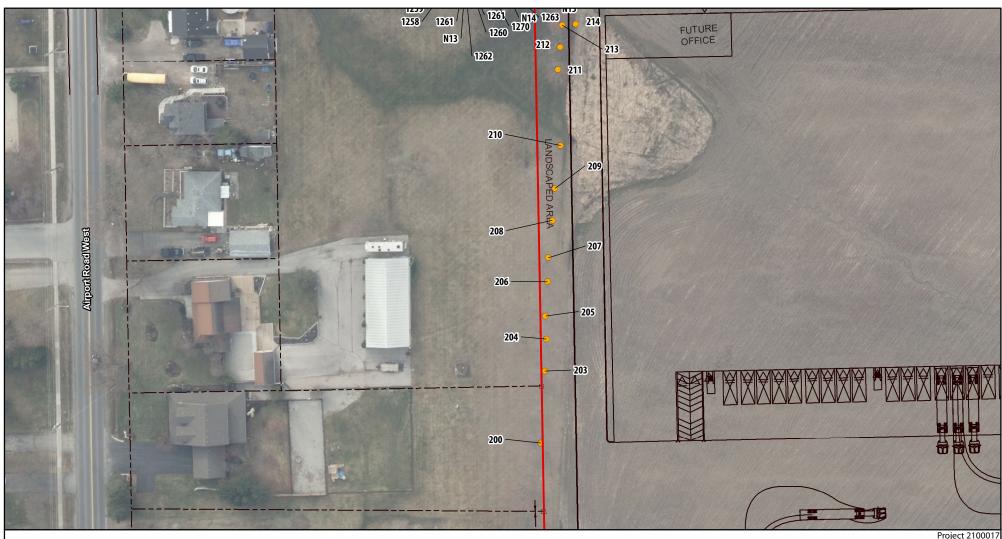


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# Figure 3.2 Tree Inventory







MOTES:

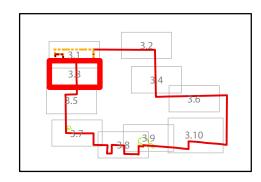
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4. Concept Plan: '413-21-Concept Plan-2023-01-31.dwg'

#### Legend

Watercourse (NPCA)

#### **Tree Inventory**

Removal - Alive

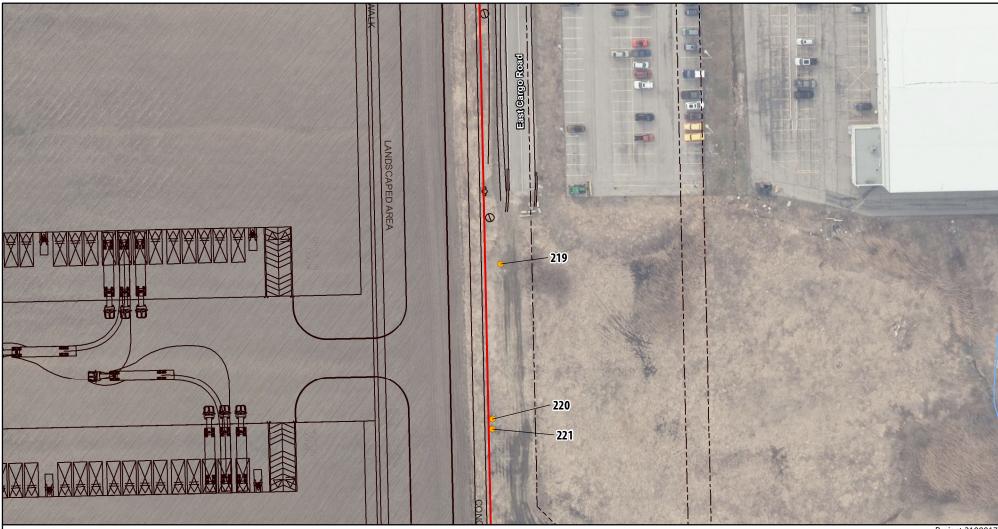


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Figure 3.3 Tree Inventory







NOTES:

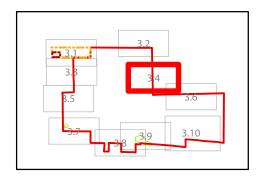
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#### Legend

Watercourse (NPCA)

#### **Tree Inventory**

Removal - Alive

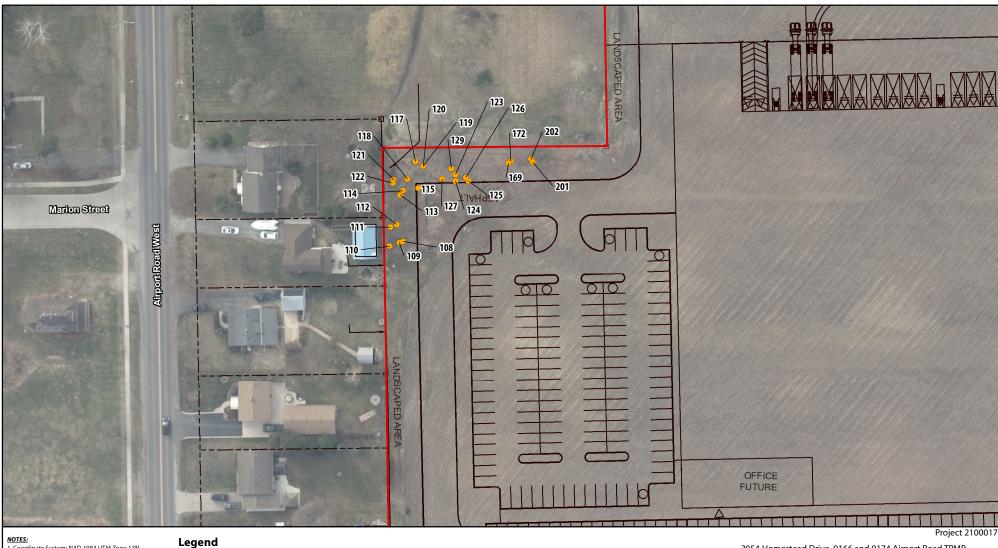


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# Figure 3.4 Tree Inventory







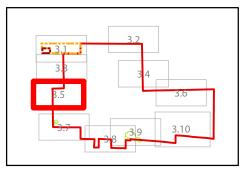
MOTES:

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4. Concept Plan: 413-21-Concept Plan-2023-01-31.dwg'

Watercourse (NPCA)

#### **Tree Inventory**

Removal - Alive

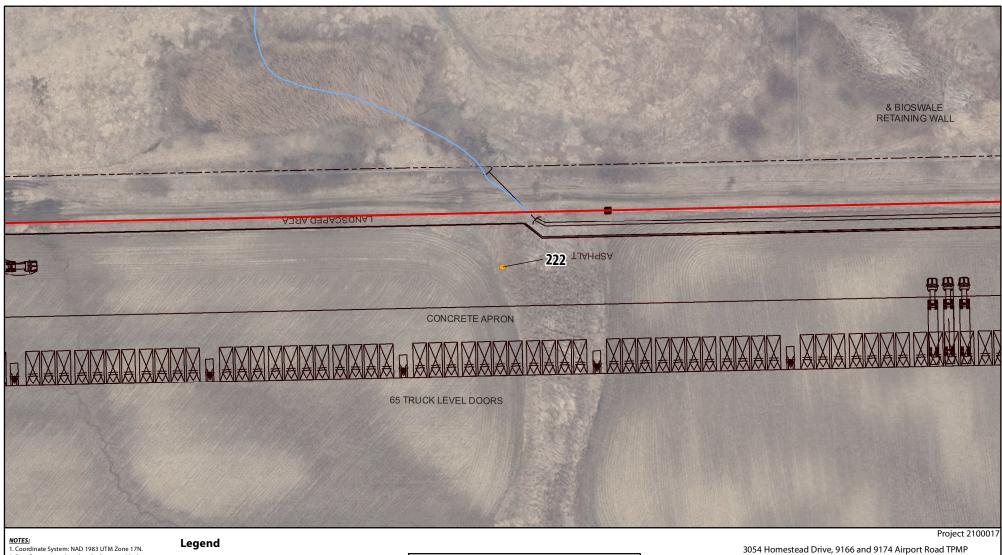


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## Figure 3.5 Tree Inventory







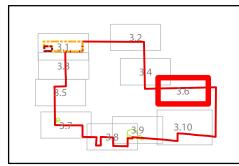
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4. Concept Plan: 413-21-Concept Plan-2023-01-31.dwg'

Watercourse (NPCA)

#### **Tree Inventory**

Removal - Alive

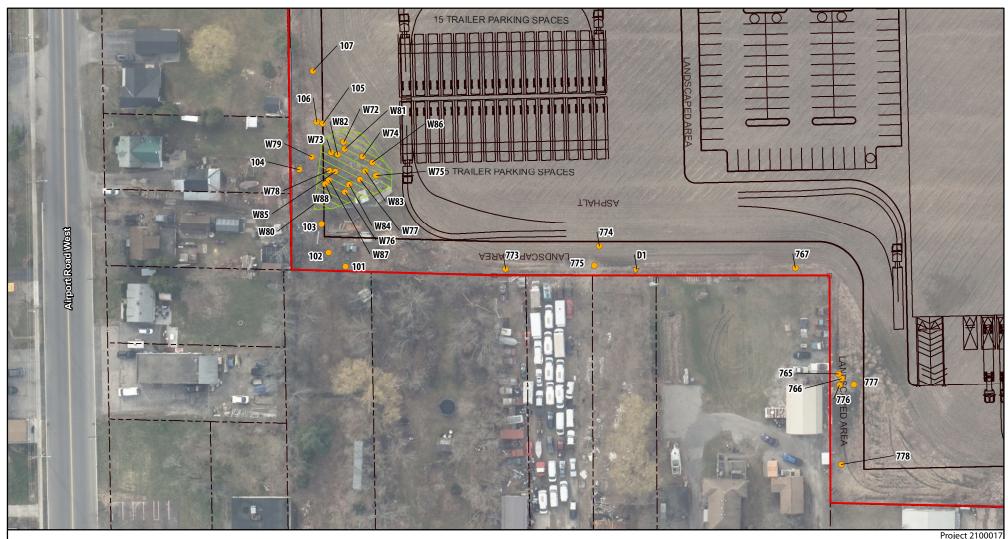


Tree Preservation and Management Plan Fengate Asset Management

## Figure 3.6 Tree Inventory







NOTES:

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4. Concept Plan: '413-21-Concept Plan-2023-01-31.dwg'

#### Legend

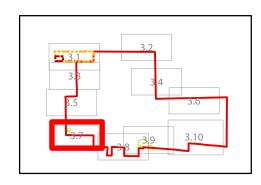
Watercourse (NPCA)

Woodland (per 2021 ELC)

#### **Tree Inventory**

Removal - Alive

A Removal - Dead

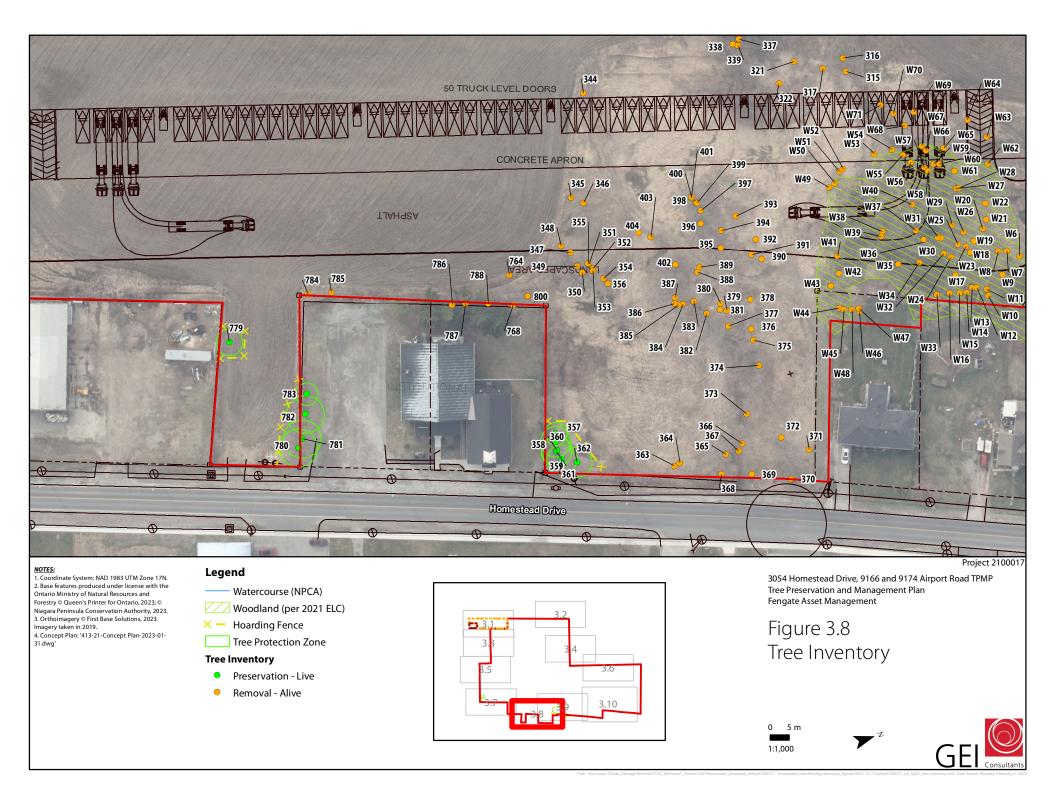


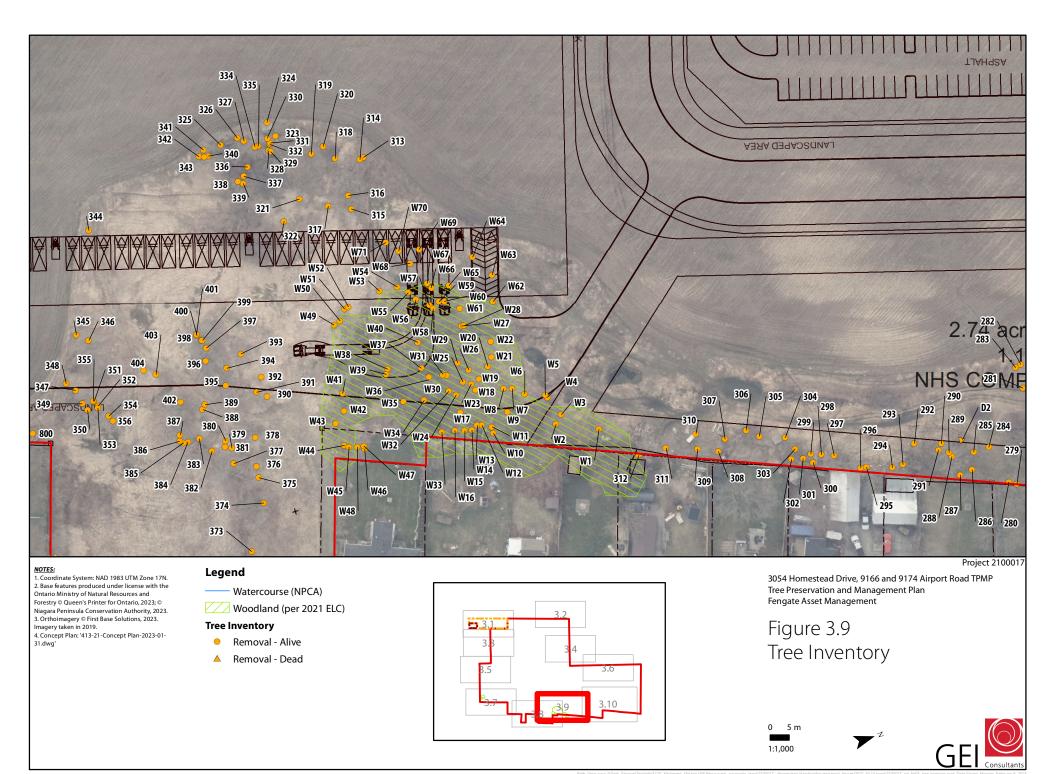
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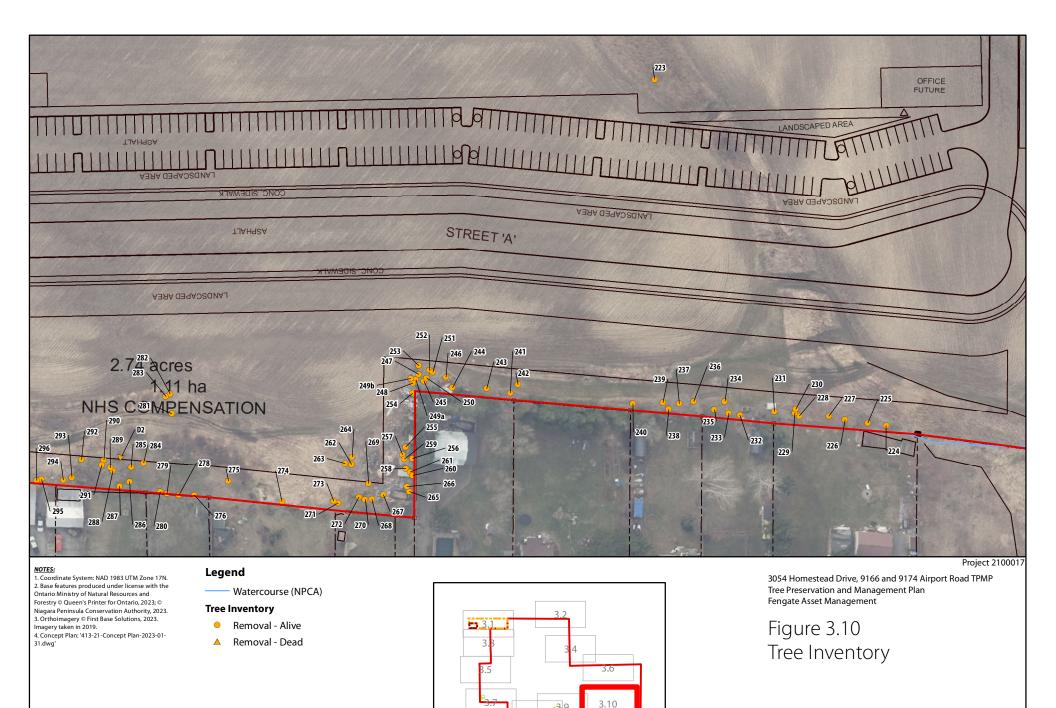
## Figure 3.7 Tree Inventory











## Appendix B

**Tables** 



The Conference   Process   Conference   Co	Tree ID			Multi-stem	DBH 1	DBH 2	DBH 3	DBH 4	DBH 5	Crown	Riological	Structural	Overall	TPZ				
10   Care   Ca		Species Common Name	Species Scientific Name	55						Radius (m)					Recommended Action	Rationale for Removals	Ownership	Notes
Big   Color   Process														-				
10   Description of the Control Cont																		
15   Name   Proposition   1																		
100   March Marge   Acre opport   22   22   0   0   0   0   0   0   0							-		-					_				Suckering, almost dead
20   Bill North   September   10   10   10   10   10   10   10   1														_				On loan, two stoms, broken limb
18   18   18   18   18   18   18   18						-		-	_		-							On lean, two stems, broken limb
19   Sex Wards									_									
17   18   18   18   18   18   18   18	109					0	0	0	0					0	Remove		Private	
17   See Newson	110	Black Walnut	Juglans nigra	16	12	10	0	0	0	3	Good	Fair	Fair	0	Remove	Located within development footprint	Private	Multiple stems
13   18   Park Willink   Apply range   17   17   0   0   0   0   0   0   0   0   0	111	Black Walnut		16	11	11	0	0	0	2.5	Good	Good	Good	0	Remove	Located within development footprint	Private	
142   143 Abrilled   Sephen right    12   12   0   0   0   0   0   0   1   1   1   1	112	Black Walnut	Juglans nigra			0	0	0			Good	Good	Good	0	Remove	Located within development footprint	Private	
15   Service Service   11   11   12   12   13   15   15   10   10   10   10   10   10			Juglans nigra			-	-					Good	Good		Remove			
17   Service																		
13   Set May   Are continued   1																		
19   Steel Marging																		
100   Service   Process Process   Process						-												Cualization
123   See Maybe   Acc searchement   13   13   0   0   0   0   15   Fez   Sex   9   Remove   Consist within Secrement Dougland   Multiple colors   Multiple		отто торго				_		-						_				Suckering
122   See Mayer   Accessfrations   15   51   51   60   60   60   70   70   70   70   70																		Multiple stoms
123   Sher Mage																		
14   14   15   Shet Mayer   Act or explorations   14   15   0   0   0   0   0   0   0   0   0																		imarapic stems
132   Silvet Mayle   Acer sextonium   15   15   0   0   0   0   0   0   0   0   0						-	-			_				_				
128   Selve Mage														_				
127   Shert Mage						-		-	_									Girdling from rope wrapped around
129   Silver Mayle									_									chang nonrepe wapped droand
150   Back Warlet   Applem orgen   12   12   12   0   0   0   0   0   2   5058   5006   5006   0.0									0					0				
17.   Bisk Waller   Age sectorisment   10   10   0   0   0   0   0   0   0	169	Black Walnut	Juglans nigra	12	12	0	0	0	0		Good	Good	Good	0	Remove	Located within development footprint	Private	
200   Marticlo Magle   Act responsible   Act r	172	Black Walnut		10	10	0	0	0	0	2	Good	Good	Good	0	Remove	Located within development footprint	Private	
202   Selex Walnut   Agent search or search	200	Silver Maple		35	35	0	0	0	0	4	Good	Good	Good	0	Remove	Located within development footprint	Boundary	
200   Marticol Magle   Acer secondarium   49   32   30   22   0   0   4   Good   Goo	201	Manitoba Maple	Acer negundo								Fair	Fair	Fair	0	Remove	Located within development footprint	Private	Wounds along stem, on lean
205   Select Maple   Aer sectorium   28   28   0   0   0   0   0   0   4   Good Good   Good							٠	·	۰			1 411		۰			11114410	
205   Selver Mapple   Acer sexcharineum   28   28   0   0   0   0   4   Good																	,	Codominant stems
200   Solver Mapple   Acer sectorarium   30   30   0   0   0   0   4   Good																		
200   Silver Maple						-												
200   Sher Maple														_				
200   Silver Maple						1												
201   Silver Maple   Aces sockharinum   31   33   0   0   0   0   0   4   Good   Fair   Fair   Aces   Good   Control   Control within development flootprint   Private   Control   Control within   Control																		Code-of-code about trade-of-code
2212   Sherr Magile   Acer sozcharnum   37   37   0   0   0   0   4   Good																		·
232   Silver Magle   Acer sacchanium   31   31   0   0   0   0   4   Good   G						-	-	-	-					_				Codominant leaders, included bark
231   Sibrer Møyle     Acer saccherinium   32   32   0   0   0   0   4   Good														-				Codominant leaders, included hark
13.14   Cottonwood   Populus defoides   37   37   0   0   0   0   4   Pair   Fair   Poor   1   1   1   1   1   1   1   1   1						-		-	_									Codominant leaders, included bank
215   Black Walnut   Jugins nigra   36   36   0   0   0   0   0   4   Poor   Fair   Poor   0   Remove   Located within development flostprint   Boundary   Crown dieback   Crown of Branch   C																		Branch dieback
Black Walnut   Juglans nigra   20   20   0   0   0   0   3   Poor   Fair   Poor   O   Remove   Located within development footprint   Boundary   Crown dieback   Crown deback   Crown de									0			Fair		0				
217   Common Apple	216	Black Walnut					0	0	0	3		Fair		0	Remove			Crown dieback
220	217	Common Apple	Malus pumila	55	55	0	0	0	0	4	Poor	Poor	Poor	0	Remove	Located within development footprint	Boundary	Stem split open, standing portion of stem bent
221   Cottonwood   Populus deltoides   27   19   19   0   0   0   3   Good   Fair   Fair   0   Remove   Located within development footprint   Boundary   Codeminant stems	218	Manitoba Maple	Acer negundo	36	28	17	15	0	0	4	Fair	Poor	Poor	0	Remove	Located within development footprint	Boundary	Multiple stems, on lean
		Cottonwood	Populus deltoides								Good	Good	Good	0	Remove	Located within development footprint	Boundary	
222   Cottonwood   Populus defoldes   17   17   0   0   0   0   1.5   Good   Good   Good   Good   Good   Good   Remove   Located within development footprint   Private   Spreading stems, colony							٠	·	۰	,		1 411		۰				
224   Willow   Salts sp.   35   20   20   20   0   0   1.5   Good   Fair   Fair   0   Remove   Located within development footprint   Private   Spreading stems, colony																		Codominant stems
224   Manitoba Maple   Acer negundo   19   12   10   10   0   0   1.5   Good   Fair   Fair   0   Remove   Located within development footprint   Private   Multiple stems, suckering						-												
225   Silver Maple   Acer soccharinum   35   35   0   0   0   0   0   3   Good   Goo																		1 0 . ,
226   Silver Maple   Acer saccharinum   42   30   30   0   0   0   4.5   Good   Fair   Fair   0   Remove   Located within development footprint   Private   Codominant stems								-						_				iviuitipie stems, suckering
227   Silver Maple   Acer saccharinum   40   25   22   18   14   0   4   Good   Fair   Fair   0   Remove   Located within development footprint   Private   Crown dieback, missing and peeling bark, diseased   228   Black Walnut   Jugians nigra   22   22   0   0   0   0   2   Fair   Fair   Fair   Fair   0   Remove   Located within development footprint   Private   Crown dieback, missing and peeling bark, diseased   230   Black Walnut   Jugians nigra   15   15   0   0   0   0   2   Fair   Fair   Fair   Fair   0   Remove   Located within development footprint   Private   Crown dieback														_				Cadaminant stams
Black Walnut Jugians nigra 25 25 0 0 0 0 0 0 2 Poor Poor Poor 0 Remove Located within development footprint Private Crown dieback, missing and peeling bark, diseased Located within development footprint Private Crown dieback (missing and peeling bark, diseased Located within development footprint Private Crown dieback (missing and peeling bark, diseased Located within development footprint Private Crown dieback (missing and peeling bark, diseased Located within development footprint Private Crown dieback (missing and peeling bark, diseased Located within development footprint Private Crown dieback (missing and peeling bark, diseased Located within development footprint Private Crown dieback (missing and peeling bark, diseased Located within development footprint Private (missing and peeling bark, diseased Located within development footprint Private (missing and peeling bark, diseased Located within development footprint Private (missing and peeling bark, diseased Located within development footprint Private (missing and peeling bark, diseased Located within development footprint Private (missing and peeling bark, diseased Located within development footprint Private (missing and peeling bark, diseased Located within development footprint Private (missing and peeling bark, diseased Located within development footprint Private (missing and peeling bark, diseased Located within development footprint Private (missing and peeling bark, diseased Located within development footprint Private (missing and peeling bark, diseased Located within development footprint Private (missing and peeling bark, diseased Located within development footprint Private (missing and peeling bark, diseased Located within development footprint Private (missing and peeling bark, diseased Located within development footprint Private (missing and peeling bark																		
230   Black Walnut   Juglans nigra   15   15   0   0   0   0   2   Fair   Fair   Fair   Fair   0   Remove   Located within development footprint   Private   Crown dieback		_																
230   Black Walnut   Juglans nigra   15   15   0   0   0   0   0   2   Fair   Fair   Fair   0   Remove   Located within development footprint   Private   Crown dieback														-				
Manitoba Maple   Acer negundo   32   25   20   0   0   0   2.5   Fair   Fair   Fair   0   Remove   Located within development footprint   Private   Codiminant stems														_				
232   Black Walnut   Juglans nigra   30   30   0   0   0   0   2.5   Good   Fair   Fair   0   Remove   Located within development footprint   Private   On lean						-		-										
233   Manitoba Maple   Acer negundo   15   15   0   0   0   0   2.5   Good   Fair   Fair   0   Remove   Located within development footprint   Private   On lean									_									
234   Manitoba Maple   Acer negundo   15   15   0   0   0   0   0   2.5   Good   Fair   Fair   0   Remove   Located within development footprint   Private   On lean														_				
235 Manitoba Maple												Fair	Fair					
236         Manitoba Maple         Acer negundo         38         38         0         0         0         0         3         Good         Geod         Coated within development footprint         Private         On lean           238         Manitoba Maple         Acer negundo         37         37         0         0         0         3         Good         Fair         Fair         0         Remove         Located within development footprint         Private         On lean           240         Manitoba Maple         Acer negundo         30         30         0         0         0         2         Good         Fair         Fair         0         Remove         Located within development footprint         Private         On lean           240         Manitoba Maple         Acer negundo         30         30         0         0         0         2.5         Fair         Fair         Fair         0 <td>235</td> <td>Manitoba Maple</td> <td></td> <td></td> <td>45</td> <td>0</td> <td>0</td> <td>0</td> <td></td> <td></td> <td>Good</td> <td>Fair</td> <td>Fair</td> <td>0</td> <td>Remove</td> <td></td> <td>Private</td> <td>On lean, suckering</td>	235	Manitoba Maple			45	0	0	0			Good	Fair	Fair	0	Remove		Private	On lean, suckering
238         Manitoba Maple         Acer negundo         37         37         0         0         0         0         1         Good         Fair         0         Remove         Located within development footprint         Private         On lean           230         Manitoba Maple         Acer negundo         30         30         0         0         0         0         2         Good         Fair         Fair         0         Remove         Located within development footprint         Private         On lean           241         Manitoba Maple         Acer negundo         30         30         0         0         0         0         2.5         Fair         Poor         Poor         Poor         Remove         Located within development footprint         Private         On lean           241         Manitoba Maple         Acer negundo         30         30         0         0         0         2.5         Fair         Poor         Poor         0         Remove         Located within development footprint         Private         On lean, crown dieback, rot on stem, holes in trunk           242         Manitoba Maple         Acer negundo         18         18         0         0         0         2.5         Good	236	Manitoba Maple	Acer negundo				0	0			Good	Good	Good	0		Located within development footprint	Private	
238         Manitoba Maple         Acer negundo         37         37         0         0         0         0         0         1         Good         Fair         0         Remove         Located within development footprint         Private         On lean           239         Manitoba Maple         Acer negundo         30         30         0         0         0         0         2         Good         Fair         Fair         0         Remove         Located within development footprint         Private         On lean           240         Manitoba Maple         Acer negundo         22         22         0         0         0         0         2         Good         Fair         Fair         O Remove         Located within development footprint         Private         On lean           241         Manitoba Maple         Acer negundo         30         30         0         0         0         2.5         Fair         Poor         Poor         Poor         Remove         Located within development footprint         Private         On lean, crown dieback, rot on stem, holes in trunk           242         Manitoba Maple         Acer negundo         18         18         0         0         0         2         Good			Acer negundo									Good			Remove			
240         Manitoba Maple         Acer negundo         22         22         0         0         0         0         2.5         Fair Poor Poor Poor Poor Poor Poor Poor Po			Acer negundo				٠		۰	,	Good	1 411	Fair		Remove	Located within development footprint		
Manitoba Maple Acer negundo 30 30 0 0 0 0 0 2.5 Fair Poor Poor 0 Remove Located within development footprint Private On lean, crown dieback, rot on stem, holes in trunk  Acer negundo 18 18 0 0 0 0 0 2 Good Fair Fair 0 Remove Located within development footprint Private On lean  Located within development footprint Private On lean, crown dieback, rot on stem, holes in trunk  Acer negundo 40 40 0 0 0 0 2.5 Good Good Good O Remove Located within development footprint Private						-				-				_				1 11
242         Manitoba Maple         Acer negundo         18         18         0         0         0         2         Good         Fair         Fair         0         Remove         Located within development footprint         Private         On lean           243         Manitoba Maple         Acer negundo         40         40         0         0         0         2.5         Good         Good         0         Remove         Located within development footprint         Private																		
243 Manitoba Maple Acer negundo 40 40 0 0 0 0 0 2.5 Good Good 0 Remove Located within development footprint Private						-												
						_		-						_				On lean
244   Manitoba Maple			,															
	244	Manitoba Maple	Acer negundo	22	17	14	0	0	0	2.5	Fair	Fair	Fair	0	Remove	Located within development footprint	Private	Codominant stems, on lean



Tree ID Number	Species Common Name	Species Scientific Name	Multi-stem DBH <sup>1</sup> (cm)	DBH 1 (cm)	DBH 2 (cm)	DBH 3 (cm)	DBH 4 (cm)	DBH 5 (cm)	Crown Radius (m)	Biological Health	Structural Health	Overall Health	TPZ (m)	Recommended Action	Rationale for Removals	Ownership	Notes
245	Manitoba Maple	Acer negundo	20	16	12	0	0	0	2.5	Fair	Fair	Fair	0	Remove	Located within development footprint	Private	Codominant stems, on lean, debris
246	Manitoba Maple	Acer negundo	20	16	12	0	0	0	2.5	Fair	Fair	Fair	0	Remove	Located within development footprint	Private	Codominant stems, on lean, debris
247	Manitoba Maple	Acer negundo	20	20	0	0	0	0	3	Fair	Fair	Fair	0	Remove	Located within development footprint	Private	On lean, debris
		Acer negundo	23	23	0	0	0	0	2	Fair	Fair Fair	Fair	0		Located within development footprint	Private	On lean, debris
251	Manitoba Maple Manitoba Maple	Acer negundo Acer negundo	26 17	17 17	15 0	12 0	0	0	2.5	Fair Fair	Fair	Fair Fair	0	Remove Remove	Located within development footprint Located within development footprint	Private Private	On lean, debris On lean, debris
252	Manitoba Maple	Acer negundo	11	11	0	0	0	0	3	Fair	Fair	Fair	0	Remove	Located within development footprint	Private	Codominant stems, on lean, debris
253	Manitoba Maple	Acer negundo	16	12	10	0	0	0	3	Fair	Fair	Fair	0	Remove	Located within development footprint	Private	Codominant stems, on lean, debris
254	Manitoba Maple	Acer negundo	46	36	28	0	0	0	3.5	Fair	Fair	Fair	0	Remove	Located within development footprint	Private	On lean, debris
255	Manitoba Maple	Acer negundo	25	25	0	0	0	0		Poor	Poor	Poor	0	Remove	Located within development footprint	Private	On lean, debris, crown dieback
256	Manitoba Maple	Acer negundo	20	20	0	0	0	0	1.5	Poor	Poor	Poor	0	Remove	Located within development footprint	Private	On lean, debris, crown dieback
257	Manitoba Maple	Acer negundo	11	11	0	0	0	0	1	Fair	Fair	Fair	0	Remove	Located within development footprint	Private	Debris
258 259	Black Walnut Manitoba Maple	Juglans nigra Acer negundo	20 11	20 11	0	0	0	0	2	Good Fair		Good Fair	0	Remove Remove	Located within development footprint Located within development footprint	Private Private	Debris, dead secondary stem
260		Juglans nigra	21	21	0	0	0	0		Good		Good	0		Located within development footprint	Private	Debris Debris
261	Black Walnut	Juglans nigra	20	20	0	0	0	0	2	Good	Fair	Good	0	Remove	Located within development footprint	Private	Debris
262	Silver Maple	Acer saccharinum	21	12	10	10	10	0	2.5	Fair	Fair	Fair	0	Remove	Located within development footprint	Private	Multiple stems
263	Silver Maple	Acer saccharinum	25	25	0	0	0	0	2.5	Fair	Fair	Fair	0	Remove	Located within development footprint	Private	Included bark
264	Willow	Salix sp.	10	10	0	0	0	0		Fair	Fair	Fair	0	Remove	Located within development footprint	Private	Crown dieback
265	Black Walnut	Juglans nigra	15	15	0	0	0	0	2	Good	Fair	Good	0	Remove	Located within development footprint	Private	Debris
266	Black Walnut	Juglans nigra	18	18	0	0	0	0	2	Good	Fair	Good	0	Remove	Located within development footprint	Private	Debris Alexandria debris
267 268	Manitoba Maple	Acer negundo	15	15	0	0	0	0	1	Poor	Poor Fair	Poor	0	Remove	Located within development footprint	Private	Almost dead, debris
268	Black Walnut Manitoba Maple	Juglans nigra Acer nequndo	15 30	15 30	0	0	0	0	2	Good Good	Fair Fair	Good Good	0	Remove Remove	Located within development footprint  Located within development footprint	Private Private	Debris Debris
		Juglans nigra	20	20	0	0	0	0		Good		Good		Remove	Located within development footprint	Private	Debris
271		Salix sp.	35	35	0	0	0	0	3	Fair	Fair	Fair	0	Remove	Located within development footprint	Private	Crown dieback, peeling bark, burn marks at base of trunk
272	Manitoba Maple	Acer negundo	21	15	15	0	0	0	3	Poor	Poor	Poor	0	Remove	Located within development footprint	Private	Almost dead, debris
273	Willow	Salix sp.	49	35	35	0	0	0	3	Fair	Fair	Fair	0	Remove	Located within development footprint	Private	Crown dieback, peeling bark, burn at base of trunk, codominant stems
274	Black Walnut	Juglans nigra	25	25	0	0	0	0	3.5	Fair	Fair	Fair	0	Remove	Located within development footprint	Boundary	Included bark in limb fork with moisture, peeling bark
275	Common Apple	Malus pumila	29	15	13	13	12	12		Good	Fair	Fair	0	Remove	Located within development footprint	Private	Multiple stems
276	Black Walnut	Juglans nigra	63	63	0	0	0	0	7	Fair	Fair	Fair	0	Remove	Located within development footprint	Boundary	Broken limbs; included bark
278	Black Walnut	Juglans nigra	35	35	0	0	0	0	6	Good		Good	0	Remove	Located within development footprint	Boundary	
279 280		Juglans nigra Juglans nigra	50 52	50 52	0	0	0	0	6 7	Poor Good		Poor Good	0	Remove Remove	Located within development footprint  Located within development footprint	Boundary Boundary	Metal grown into trunk in cavity, water damage, missing limb
281	Green Ash	Fraxinus pennsylvanica	21	12	12	12	0	0	2	Poor	Poor	Poor	0	Remove	Located within development footprint	Private	Crown dieback, lower branch growth
282	Cottonwood	Populus deltoides	45	45	0	0	0	0	2	Fair	Fair	Fair		Remove	Located within development footprint	Private	Oozing wound on trunk
283	Willow	Salix sp.	33	27	19	0	0	0	4	Fair	Fair	Fair	0	Remove	Located within development footprint	Private	Split at base
284	Black Walnut	Juglans nigra	10	10	0	0	0	0	1.5	Good	Good	Good	0	Remove	Located within development footprint	Private	
285	Black Walnut	Juglans nigra	20	20	0	0	0	0		Good	Good	Good	0	Remove	Located within development footprint	Private	
286	Black Walnut	Juglans nigra	16	16	0	0	0	0	2	Good	Good	Good	0	Remove	Located within development footprint	Private	
287		Juglans nigra	26	21	16	0	0	0		Good	Good	Good	0	Remove	Located within development footprint	Private	
288	Manitoba Maple Manitoba Maple	Acer negundo	16 15	16 15	0	0	0	0	2	Poor Fair	Poor Fair	Poor Fair	0	Remove	Located within development footprint	Private Private	Dead stems Crown dieback, on lean
289		Acer negundo Acer negundo	21	16	13	0	0	0		Fair	Fair Fair	Fair	_	Remove Remove	Located within development footprint  Located within development footprint	Private	Crown dieback, on lean Crown dieback, codominant stems
291	Manitoba Maple	Acer negundo	25	25	0	0	0	0		Good	Good	Good	0	Remove	Located within development footprint	Private	Crown dieback, codominant stems
292		Acer negundo	25	19	17	0	0	0		Fair	Fair	Fair	0	Remove	Located within development footprint	Private	Codominant stems
293	Black Walnut	Juglans nigra	25	25	0	0	0	0	3	Good	Good	Good	0	Remove	Located within development footprint	Private	
294	Manitoba Maple	Acer negundo	25	25	0	0	0	0	2.5	Fair	Fair	Fair	0	Remove	Located within development footprint	Private	On lean, crown dieback
295	Black Walnut	Juglans nigra	28	28	0	0	0	0	2.5	Good	Fair	Fair	0	Remove	Located within development footprint	Private	Debris
296	Manitoba Maple	Acer negundo	42	30	30	0	0	0	3	Fair	Fair	Fair	0	Remove	Located within development footprint	Private	Debris, dead limbs, growing against shed
297		Acer negundo	13	13	0	0	0	0		Fair	Fair Fair	Fair	0	Remove	Located within development footprint	Private	On severe lean
298 299	Black Walnut Black Walnut	Juglans nigra	33 16	33 16	0	0	0	0	4 1.5	Fair Fair	Fair Fair	Fair Fair	0	Remove Remove	Located within development footprint  Located within development footprint	Private Private	Debris, multiple stems Debris
300	Black Walnut	Juglans nigra Juglans nigra	11	11	0	0	0	0		Fair		Fair		Remove	Located within development footprint  Located within development footprint	Private	Debris, multiple stems
301		Juglans nigra	22	22	0	0	0	0		Fair		Fair	0	Remove	Located within development footprint	Private	Debris, multiple stems
302	Black Walnut	Juglans nigra	20	12	12	10	0	0	2	Fair	Fair	Fair	0	Remove	Located within development footprint	Private	Debris, multiple stems
303	Black Walnut	Juglans nigra	20	13	12	10	0	0	2.5	Fair	Fair	Fair	0	Remove	Located within development footprint	Private	Debris, multiple stems
304	Black Walnut	Juglans nigra	22	18	12	0	0	0	2.5	Fair	Fair	Fair	0	Remove	Located within development footprint	Private	Debris, multiple stems
305	Black Walnut	Juglans nigra	18	13	13	0	0	0	2.5	Fair	Fair	Fair	0	Remove	Located within development footprint	Private	Debris, multiple stems
306	Black Walnut	Juglans nigra	21	15	15	0	0	0	2.5	Fair	Fair	Fair	0	Remove	Located within development footprint	Private	Codominant stems
307 308	Black Walnut Black Walnut	Juglans nigra	13 18	13 11	10	0 10	0	0	2.5	Good Fair	Fair Fair	Fair Fair	0	Remove Remove	Located within development footprint Located within development footprint	Private Private	Debris Debris, multiple stems
308		Juglans nigra Acer neaundo	32	32	10	10	0	0	3	Fair	Fair Fair	Fair Fair	0	Remove	Located within development footprint  Located within development footprint	Private	Debris, multiple stems Tree house, on lean
310	Black Walnut	Juglans nigra	20	20	0	0	0	0		Good	Good	Good	0	Remove	Located within development footprint	Private	nee nouse, un tean
311		Acer negundo	20	20	0	0	0	0	4	Good	Good	Good	0	Remove	Located within development footprint	Private	
312	Black Walnut	Juglans nigra	26	26	0	0	0	0	4	Fair	Fair	Fair	0	Remove	Located within development footprint	Boundary	Debris
313	Black Walnut	Juglans nigra	11	11	0	0	0	0	1.5	Good	Good	Good	0	Remove	Located within development footprint	Private	
314	_	Acer negundo	15	11	10	0	0	0	2	Good	Fair	Fair	0	Remove	Located within development footprint	Private	Multiple stems, bent stem
315	Black Walnut	Juglans nigra	17	12	12	0	0	0	2	Good	Fair	Fair	0	Remove	Located within development footprint	Private	Codominant stems
316	Black Walnut	Juglans nigra	12	12	0	0	0	0	2	Good	Good	Good	0	Remove	Located within development footprint	Private	
317 318	Black Walnut Black Walnut	Juglans nigra	10	10 11	0	0	0	0	2	Good		Good Fair	0	Remove	Located within development footprint	Private Private	Cademinant stone
318		Juglans nigra Juglans nigra	11	11	0	0	0	0	1.5	Good Good	Fair Good	Good	0	Remove Remove	Located within development footprint Located within development footprint	Private Private	Codominant stems
		Jugians nigra Morus alba	32	15	15	14	14	14		Fair		Fair	_	Remove	Located within development footprint		Multiple stems
320	**************************************	moras arba	32	1.5	1.7	17	17		5.5	1. 411	1. 011		U		Located within development footprint	THE	manapic stems



Tree ID			Multi-stem	DBH 1	DBH 2	DBH 3	DBH 4	DBH 5	Crown	Biological	Structural	Overall	TPZ				
Number	Species Common Name	Species Scientific Name	DBH <sup>1</sup> (cm)	(cm)	(cm)	(cm)	(cm)	(cm)	Radius (m)	Health	Health	Health	(m)	Recommended Action	Rationale for Removals	Ownership	Notes
321	Manitoba Maple	Acer negundo	20	20	0	0	0	0	2.5	Good	Good	Good	0	Remove	Located within development footprint	Private	
322	Black Walnut	Juglans nigra	16	16	0	0	0	0	3	Good	Good	Good	0	Remove	Located within development footprint	Private	
323 324	Manitoba Maple Manitoba Maple	Acer negundo	27 27	16 16	15 15	15 15	0	0	3	Fair Fair	Fair Fair	Fair Fair	0	Remove	Located within development footprint	Private Private	Debris, multiple stems Debris, multiple stems
325	Manitoba Maple	Acer negundo Acer negundo	35	20	20	20	0	0	4	Fair	Fair	Fair	0	Remove Remove	Located within development footprint Located within development footprint	Private	Debris, multiple stems  Debris, multiple stems
326	Manitoba Maple	Acer negundo	25	25	0	0	0	0	4	Fair	Fair	Fair	0	Remove	Located within development footprint	Private	Debris, multiple stems
327	Manitoba Maple	Acer negundo	48	30	28	25	0	0	4	Fair	Fair	Fair	0	Remove	Located within development footprint	Private	Debris, multiple stems
328	Manitoba Maple	Acer negundo	24	24	0	0	0	0	3	Fair	Fair	Fair	0	Remove	Located within development footprint	Private	Debris, on lean
329	Manitoba Maple	Acer negundo	24	24	0	0	0	0	3	Fair	Fair	Fair	0	Remove	Located within development footprint	Private	Debris, on lean
330 331	Manitoba Maple Manitoba Maple	Acer negundo	22 24	18 24	13	0	0	0	3	Fair Fair	Fair Fair	Fair Fair	0	Remove	Located within development footprint  Located within development footprint	Private Private	Debris, on lean, twisted stem
331	Manitoba Maple	Acer negundo Acer negundo	22	22	0	0	0	0	3	Fair	Fair	Fair	0	Remove Remove	Located within development footprint Located within development footprint	Private	Debris, on lean Debris, on lean
334	Manitoba Maple	Acer negundo	18	18	0	0	0	0	2	Fair	Fair	Fair	0	Remove	Located within development footprint	Private	Debris, on lean
335	Manitoba Maple	Acer negundo	15	15	0	0	0	0	2	Fair	Fair	Fair	0	Remove	Located within development footprint	Private	Debris, on lean
336	Manitoba Maple	Acer negundo	24	15	13	13	0	0	4	Fair	Fair	Fair	0	Remove	Located within development footprint	Private	Debris, multiple stems, on lean
337	Manitoba Maple	Acer negundo	18	18	0	0	0	0	3	Fair	Fair	Fair	0	Remove	Located within development footprint	Private	Debris
338	Manitoba Maple	Acer negundo	18	18	0	0	0	0	3	Fair	Fair	Fair	0	Remove	Located within development footprint	Private	Debris, on lean
339	Manitoba Maple	Acer negundo	18	18	0	0	0	0	3		Fair	Fair		Remove	Located within development footprint	Private	Debris, on lean
340	Manitoba Maple	Acer negundo	35	22	20	18	0	0	4.5	Fair	Fair	Fair	0	Remove	Located within development footprint	Private	Debris, multiple stems
341	Manitoba Maple	Acer negundo	12	12	0	0	0	0	3	Fair	Fair	Fair	0	Remove	Located within development footprint	Private	Debris, multiple stems
342 343	Manitoba Maple Manitoba Maple	Acer negundo Acer negundo	27 13	22 13	15 0	0	0	0	3	Good	Good	Good Good	0	Remove Remove	Located within development footprint Located within development footprint	Private Private	
344	Black Walnut	Juglans nigra	15	15	0	0	0	0	3	Fair	Fair	Fair	0	Remove	Located within development footprint	Private	Overgrown with vines
345	Black Walnut	Juglans nigra	15	15	0	0	0	0	3	Good	Good	Good	0	Remove	Located within development footprint	Private	overgrown with vines
346	Manitoba Maple	Acer neaundo	59	35	35	25	20	0	5	Good	Fair	Fair	0	Remove	Located within development footprint	Private	Spreading branches
347	Manitoba Maple	Acer negundo	28	28	0	0	0	0	3	Fair	Fair	Fair	0	Remove	Located within development footprint	Private	On lean, bent stem
348	Manitoba Maple	Acer negundo	28	28	0	0	0	0	3	Fair	Fair	Fair	0	Remove	Located within development footprint	Private	On lean, bent stem
349	Manitoba Maple	Acer negundo	23	18	15	0	0	0	2.5	Fair	Fair	Fair	0	Remove	Located within development footprint	Private	On lean, multiple stems
350	Manitoba Maple	Acer negundo	42	42	0	0	0	0	4	Fair	Fair	Fair	0		Located within development footprint	Private	Codominant limbs, included bark
351	Black Walnut	Juglans nigra	12	12	0	0	0	0	3	Good	Good	Good	0	Remove	Located within development footprint	Private	
352	Manitoba Maple	Acer negundo	16	16	0	0	0	0	2	Good	Fair	Fair	0	Remove	Located within development footprint	Private	Codominant stems
353 354	Manitoba Maple Manitoba Maple	Acer negundo Acer negundo	15 21	15 15	0 15	0	0	0	2.5	Good Fair	Fair Fair	Fair Fair	0	Remove Remove	Located within development footprint Located within development footprint	Private Private	On lean Codominant stems
355	Black Walnut	Juglans nigra	16	16	0	0	0	0	2.5	Good	Good	Good	0	Remove	Located within development footprint	Private	Codominant stems
356	Manitoba Maple	Acer negundo	13	13	0	0	0	0	2	Good	Fair	Fair	0	Remove	Located within development footprint	Private	On lean, curved stem
357	Manitoba Maple	Acer negundo	13	13	0	0	0	0	2	Good	Good	Good	3	Preserve		Private	
358	Manitoba Maple	Acer negundo	28	28	0	0	0	0	3	Good	Good	Good	4	Preserve		Private	
359	Manitoba Maple	Acer negundo	28	28	0	0	0	0	3	Good	Good	Good	4	Preserve		Private	
360	Manitoba Maple	Acer negundo	28	28	0	0	0	0	3	Good	Good	Good	4	TTCSCTVC		Private	
361	Silver Maple	Acer saccharinum	12	12	0	0	0	0	3	Fair	Fair	Fair	4			Private	Peeling bark
362	Black Walnut	Juglans nigra	18	18	0	0	0	0	3	Good	Good	Good	4	Preserve		Private	
363 364	Black Walnut Black Walnut	Juglans nigra Juglans nigra	12 15	12 15	0	0	0	0	2.5	Good	Good Good	Good Good	0	Remove Remove	Located within development footprint Located within development footprint	Private Private	
365	Manitoba Maple	Acer negundo	25	25	0	0	0	0	3	Good	Fair	Fair	0	Remove	Located within development footprint	Private	On lean
366	Black Walnut	Juglans nigra	11	11	0	0	0	0	2	Good	Good	Good	0	Remove	Located within development footprint	Private	on team
367	Black Walnut	Juglans nigra	12	12	0	0	0	0	2	Good	Good	Good	0	Remove	Located within development footprint	Private	
368	Sugar Maple	Acer saccharum	60	60	0	0	0	0	2.5	Poor	Poor	Poor	0	Remove	Located within development footprint	Private	Mostly dead, one live limb
369	Horse Chestnut	Aesculus hippocastanum	55	55	0	0	0	0		Poor	Poor	Poor	0	Remove	Located within development footprint	Private	Mostly dead, lower limbs live
370	Horse Chestnut	Aesculus hippocastanum	45	45	0	0	0	0	2.5	Fair	Fair	Fair	0	Remove	Located within development footprint	Boundary	Crown dieback
371	Horse Chestnut	Aesculus hippocastanum	30	30	0	0	0	0	2	Fair	Fair	Fair	0	Remove	Located within development footprint	Private	Crown dieback
372	Tulip Tree	Liriodendron tulipifera	50	50	0	0	0	0	4	Good	Good	Good	0	Remove	Located within development footprint	Private	Missing limbs, enrouding branches
373 374	Manitoba Maple Norway Maple	Acer negundo Acer platanoides	50 52	50 30	0 25	0 20	20	20	4 5	Fair Fair	Poor Fair	Poor Fair	0	Remove Remove	Located within development footprint Located within development footprint	Private Private	Missing limbs, sprawling branches  Multiple stems
374	Manitoba Maple	Acer piatanoiaes Acer neaundo	15	15	0	0	0	0	3	Good	Fair	Fair	0	Remove	Located within development footprint  Located within development footprint	Private	On lean
376	Black Walnut	Juglans nigra	15	15	0	0	0	0	2.5	Good	Good	Good	0	Remove	Located within development footprint	Private	
377	Manitoba Maple	Acer negundo	28	28	0	0	0	0	3	Fair	Fair	Fair	0	Remove	Located within development footprint	Private	Broken limbs
378	Black Walnut	Juglans nigra	15	15	0	0	0	0	2.5	Good	Good	Good	0	Remove	Located within development footprint	Private	
379	Black Walnut	Juglans nigra	12	12	0	0	0	0	2	Good	Good	Good	0	Remove	Located within development footprint	Private	
380	Black Walnut	Juglans nigra	10	10	0	0	0	0	1.5	Good	Good	Good	0	Remove	Located within development footprint	Private	
381	Black Walnut	Juglans nigra	15	15	0	0	0	0	2	Good	Good	Good	0	Remove	Located within development footprint	Private	
382	Black Walnut	Juglans nigra	15	15	0	0	0	0	2	Good	Good	Good	0	Remove	Located within development footprint	Private	
383	Black Walnut	Juglans nigra	20	20	0	0	0	0	2	Good	Good	Good	0	Remove	Located within development footprint	Private	
384 385	Black Walnut Black Walnut	Juglans nigra Juglans nigra	18 18	18 18	0	0	0	0	2	Good	Good Good	Good Good	0	Remove Remove	Located within development footprint Located within development footprint	Private Private	
386	Black Walnut	Jugians nigra Jualans niara	14	14	0	0	0	0	2	Good	Good	Good	0	Remove	Located within development footprint	Private	
387	Black Walnut	Juglans nigra	13	13	0	0	0	0	2	Good	Good	Good	0	Remove	Located within development footprint	Private	
388	Black Walnut	Juglans nigra	11	11	0	0	0	0	2	Good	Good	Good	0	Remove	Located within development footprint	Private	
389	Black Walnut	Juglans nigra	10	10	0	0	0	0	2	Good	Good	Good	0		Located within development footprint	Private	
390	Black Walnut	Juglans nigra	21	15	15	0	0	0	2	Fair	Fair	Fair	0	Remove	Located within development footprint	Private	Codominant stems
391	Black Walnut	Juglans nigra	21	15	15	0	0	0	2	Fair	Fair	Fair	0	Remove	Located within development footprint	Private	Codominant stems
392	Black Walnut	Juglans nigra	10	10	0	0	0	0	2	Good	Good	Good	0	Remove	Located within development footprint	Private	
393	Manitoba Maple	Acer negundo	10	10	0	0	0	0	2	Good	Good	Good	0	Remove	Located within development footprint	Private	
394 395	Manitoba Maple	Acer negundo	14 17	14 17	0	0	0	0	2	Good	Good	Good Good	0	Remove	Located within development footprint  Located within development footprint	Private Private	
393	Manitoba Maple	Acer negundo	1/	1/	U	U	l U	U		doon	GOOU	GUUU	U	Remove	Located within development iootprint	riivate	



Mathematical Control of the Control of the Control of the Control of Contro	T 10			Multi-stem	DBH 1	DBH 2	DBH 3	DBH 4	DBH 5	Crown	B'-l'I	C11	0	TPZ				
10   No. No. Market   10   No.	Tree ID Number	Species Common Name	Species Scientific Name								Biological Health	Structural Health			Recommended Action	Rationale for Removals	Ownership	Notes
10   March March   10   10   10   10   10   10   10   1	396	Manitoba Maple	Acer negundo		20	0	0	0	0		Good	Fair	Fair	0	Remove	Located within development footprint	Private	Multiple stems
10					_		-						_					
Column   C																		
Column   Value   Accompany   14						-						1 011						
Column   C						-	_											
Column   C																		
Mathematics																		spreading branches
15																		
Processor   Proc																		
10.000   10.0000   10.000000   10.000000   10.000000   10.000000   10.000000   10.000000   10.000000   10.000000   10.000000   10.000000   10.000000   10.000000   10.0000000   10.00000000   10.0000000000	765	Cottonwood										Good		0			Private	
No.   Process May   Contentment of the process of		Cottonwood	Populus deltoides			0	0	0			Good	Good	Good		Remove	Located within development footprint	Private	
Process   Proc	767	Black Walnut	Juglans nigra	14	14	0	0	0	0	1.5	Good	Good	Good	0	Remove	Located within development footprint	Private	
Processor   Propose delivery   Processor   Processor		Norway Maple	Acer platanoides									Fair	Fair	0	Remove	Located within development footprint	Boundary	Rust spots on leaves, codominant stems, on slight lean; grown into fence
Procedure   Proc			······································			Ū	Ü	_				i un						EAB, peeling bark, branch dieback
Processor   Proc			.,			_	_							-				
17   Command   Papus Anthonius   38   38   30   0   0   0   0   0   0   0   0																		
273   Marchia Magne   Aer egypoth   20   17   11   0   0   0   0   2   0   0   1   2   0   0   0   0   0   2   0   0   0																		
179   Martins Martins   Martins Martins Martins   Martins Martins Martins   Martins Ma																		'
18														_		Located within development footprint		
Statistic Martin   Autoregraphs																		
The contract Market   Accordance   Accorda			_															
An image   Age																	-	
1945   Giver Aug.   Princing perimphones   13   13   10   0   0   0   0   0   0   0   0														-				Multiple sprawling stems; grown into fence; twig dieback
Prof.   New May   Are protected   Prof.   Pr						-		_		_						Located within development featherint		
150   Norway Maybrigh   Actor pictoresidents   27   27   27   0   0   0   0   0   0   1   1   1   1												Fair						Grown into fence
None   Market   Process   Process												Fair						
19	780	INOI Way IVIAPIE	Acer platariolaes	21	21	U		0	0		raii	raii	raii	U	Kemove	Eocated Within development lootprint	Boundary	
180   Norway Margine   Keer pistanocière   41   25   31   0   0   0   4   7   7   7   7   7   7   7   7   7	787	Norway Maple	Acer platanoides		14	14		0	0	2.5	Poor	Poor	Poor	0	Remove	Located within development footprint	Boundary	
1235   Maritich Magle   Aer regundo   29   29   0   0   0   0   2.5   fair   Part   Poor   Aer regundo   Aer regundo   29   29   0   0   0   0   0   2.5   Fair   Poor   Poor   0   Remove   Located within development footprint   Moundary   Perling burk, funga growth   1212   Maritich Magle   Aer regundo   40   60   0   0   0   0   2.5   Fair   Poor   Poor   0   Remove   Located within development footprint   Moundary   Perling burk, funga growth   1212   Maritich Magle   Aer regundo   30   0   0   0   0   0   0   0   0								_			_				Remove			
1313   Martinob Mugle   Acer regarde   6   6   0   0   0   0   0   2.5   Fact   Proor   Proor   0   Remove   Incident with development footprint   Specially Specially Report   Specially Report   Specially Report   Specially Specially Report   Specially Rep			Acer platanoides												Remove	Located within development footprint		Rust spots on leaves, two stems, included bark; grown into fence
Marmotos Mapple   Acer regrende   50   60   0   0   0   0   0   0   0   0							_							_				
Marintole Mapple   Acer regunde   39   19   0   0   0   0   0   2   5   6000   6000   6000   6000   1   8   8   8   1   1   1   1   1   1						_	-							-				
1324   Markitok Majele   Acer regundo   25   25   25   0   0   0   0   2   500d   500d   500d   0   Remove   Located within development toopprint   Private						-	_		_					_				
Marticles Mapile   Aer regundo   76   71   71   71   71   71   71   71							_		_									Spreading limbs, cracked at base of limbs, dead limb
1378   Martoba Mapple   Aer negrundo   39   32   23   0   0   0   2.5   Good   Final   Fair   0   Remove   Located within development footprint   Noting Manager   Noting Mana							-											
Manteba Maple   Acer negrando   65   54   28   22   20   0   0   4   Good   Poor   Fair   0   Remove   Located within development todaprint   1   1239   Manteba Maple   Acer negrando   25   25   0   0   0   0   0   4   Good   Good   Good   0   Remove   Located within development todaprint   1   1240   Norway Spruce   Picca abies   42   42   0   0   0   0   0   4   Good   Good   Good   0   Remove   Located within development todaprint   1   1   1240   Norway Spruce   Picca abies   42   42   0   0   0   0   0   2   Fair   Fair   1   0   Remove   Located within development todaprint   1   1   1   1   1   1   1   1   1																		Hallow at hase of stem surroading limbs
1238   Norway Spruce   Pece ables   42   42   0   0   0   0   0   0   0   0   0												1 011		_				
1239   Norway Spruce   Pice ables   42   42   0   0   0   0   4   Good   Good   Semove   Located within development footprint   Boundary								_						_				, , , , , , , , , , , , , , , , , , , ,
1240   Mantiob Maple   Acer ascubrium   29   21   14   14   0   0   2   Fair   Fair   16   16   16   16   16   16   16   1						_												orrican
Manicha Maple   Acer negundo   29   21   14   14   0   0   0   2   Fair   Fair   0   Remove   Located within development footprint   Private   1243   Manicha Maple   Acer negundo   27   27   0   0   0   0   3   Good   Good   Good   Good   Good   Gendo   Remove   Located within development footprint   Private   Manicha Maple   Acer seccherinum   37   31   21   0   0   0   3   Good   Good   Good   Good   Remove   Located within development footprint   Private   Manicha Maple   Acer seccherinum   25   18   18   0   0   0   3   Good   Good   Good   Remove   Located within development footprint   Private   Located within								_									,	
Norway Spruce   Rieca ables   37   37   0   0   0   0   0   3   Good   Good   Good   0   Remove   Located within development footprint   Private						14	14		0					0				On lean, growing into shed structure
Mantoba Maple   Acer negundo   27   27   0   0   0   0   3   Good   Good   Good   O   Remove   Located within development footprint   Private					37	0					Good	Good	Good	0		Located within development footprint	Boundary	
1246   Silver Maple   Acer saccharinum   25   18   18   0   0   0   0   3   Good   Fair   Fair   0   Remove   Located within development footprint   Private   Codominant stems   1246   Silver Maple   Acer saccharinum   34   24   24   0   0   0   0   3   Good   Good	1243	Manitoba Maple	Acer negundo	27	27	0	0	0	0	3	Good	Good	Good	0	Remove	Located within development footprint	Private	
Silver Maple   Aer saccharinum   34   24   24   0   0   0   0   3   Good   Fair   Fair   0   Remove   Located within development footprint   Private	1244	Silver Maple	Acer saccharinum	37	31	21	0	0	0	3	Good	Good	Good	0	Remove	Located within development footprint	Private	
Manitoba Maple   Acer neguration   26   26   0   0   0   0   0   3   Good   Good   Good   O   Remove   Located within development footprint   Private	1245	Silver Maple	Acer saccharinum	25	18	18	0	0	0	3	Good	Fair	Fair	0	Remove	Located within development footprint	Private	Codominant stems
Silver Maple		Silver Maple	Acer saccharinum			24	0				Good	Fair	Fair	_	Remove	Located within development footprint		Codominant stems
Black Wafnut   Juglans nigra   23   23   0   0   0   0   4   Good   Good   Good   Good   O   Remove   Located within development footprint   Private						-		_	_						Remove			
1250   Black Walnut									-									
1251   Common Apple   Malus pumila   37   37   0   0   0   0   3.5   Good   Good   Good   0   Remove   Located within development footprint   Private																		
1252   Manitoba Maple   Acer negundo   19   19   0   0   0   0   0   3   Good   Good   Good   0   Remove   Located within development footprint   Private   1254   Silver Maple   Acer soccharinum   18   18   0   0   0   0   0   3   Good   Good   Good   0   Remove   Located within development footprint   Private   1255   Silver Maple   Acer soccharinum   15   15   0   0   0   0   3   Good   Good   Good   Good   0   Remove   Located within development footprint   Private   1256   Silver Maple   Acer soccharinum   15   15   0   0   0   0   3   Good   Good   Good   Good   0   Remove   Located within development footprint   Private   1256   Silver Maple   Acer soccharinum   17   17   0   0   0   0   3   Good   Good   Good   Good   0   Remove   Located within development footprint   Private   1257   Silver Maple   Acer soccharinum   17   17   0   0   0   0   3   Good   Good   Good   Good   0   Remove   Located within development footprint   Private   1258   Silver Maple   Acer soccharinum   18   18   0   0   0   0   3   Good   Good   Good   Good   0   Remove   Located within development footprint   Private   1259   Silver Maple   Acer soccharinum   16   16   0   0   0   0   3   Good   Good   Good   0   Remove   Located within development footprint   Private   1250   Silver Maple   Acer soccharinum   16   16   0   0   0   0   3   Good   Good   Good   0   Remove   Located within development footprint   Private   1251   Silver Maple   Acer soccharinum   18   18   0   0   0   0   3   Good   Good   0   Remove   Located within development footprint   Private   1252   Silver Maple   Acer soccharinum   18   18   0   0   0   0   3   Good   Good   0   Remove   Located within development footprint   Private   1252   Silver Maple   Acer soccharinum   18   18   0   0   0   0   3   Good   Good   Good   0   Remove   Located within development footprint   Private   1252   Silver Maple   Acer soccharinum   18   18   0   0   0   0   3   Good   Good   Good   Good   0   Remove   Located within development footprint   Private   1253   S																		
1253   Norway Spruce   Picea ables   22   22   0   0   0   0   0   3   Good   Good   Good   Good   Good   Remove   Located within development footprint   Private   1254   Silver Maple   Acer saccharinum   15   15   0   0   0   0   3   Good   Good   Good   Good   Remove   Located within development footprint   Private   1255   Silver Maple   Acer saccharinum   13   13   0   0   0   0   0   3   Good   Good   Good   Good   Good   Remove   Located within development footprint   Private   1256   Silver Maple   Acer saccharinum   17   17   0   0   0   0   3   Good   Good   Good   Good   Remove   Located within development footprint   Private   1258   Silver Maple   Acer saccharinum   18   18   0   0   0   0   0   3   Good   Good   Good   Remove   Located within development footprint   Private   1259   Silver Maple   Acer saccharinum   16   16   0   0   0   0   3   Good   Good   Good   Good   Remove   Located within development footprint   Private   1259   Silver Maple   Acer saccharinum   16   16   0   0   0   0   3   Good   Good   Good   Remove   Located within development footprint   Private   1250   Silver Maple   Acer saccharinum   16   16   0   0   0   0   3   Good   Good   Good   Remove   Located within development footprint   Private   1261   Silver Maple   Acer saccharinum   18   18   0   0   0   0   3   Good   Good   Good   Remove   Located within development footprint   Private   1261   Silver Maple   Acer saccharinum   18   18   0   0   0   0   3   Good   Good   Good   Remove   Located within development footprint   Private   1262   Silver Maple   Acer saccharinum   18   18   0   0   0   0   3   Good   Good   Good   Remove   Located within development footprint   Private   1263   Silver Maple   Acer saccharinum   16   16   0   0   0   0   3   Good   Good   Good   Good   Remove   Located within development footprint   Private   1264   Silver Maple   Acer saccharinum   15   15   0   0   0   0   3   Good   Good   Good   Good   Remove   Located within development footprint   Private   1264   Silver Maple   A							-							_				
1254   Silver Maple   Acer saccharinum   18   18   0   0   0   0   0   3   Good   Good   Good   O   Remove   Located within development footprint   Private																		
1255   Silver Maple   Acer saccharinum   15   15   0   0   0   0   0   3   Good   Go						-	-							_				
1256   Silver Maple   Acer saccharinum   13   13   0   0   0   0   0   0   3   Good   Good   Good   O   Remove   Located within development footprint   Private																		
1257   Silver Maple   Acer saccharinum   17   17   0   0   0   0   0   3   Good   Good   Good   0   Remove   Located within development footprint   Private																		
1258   Silver Maple   Acer saccharinum   18   18   0   0   0   0   0   3   Good   Good   Good   O   Remove   Located within development footprint   Private		ааар.а				_	-							-				
1259   Silver Maple   Acer saccharinum   16   16   0   0   0   0   0   3   Good   Good   Good   O   Remove   Located within development footprint   Private		eeep.e				-	_	-	_					_				
1261   Silver Maple   Acer saccharinum   16   16   0   0   0   0   0   3   Good   Good   Good   O   Remove   Located within development footprint   Private							_											
1261   Silver Maple   Acer saccharinum   18   18   0   0   0   0   0   3   Good   Good   Good   O   Remove   Located within development footprint   Private		·																
1261   Silver Maple   Acer saccharinum   18   18   0   0   0   0   0   3   Good   Good   Good   0   Remove   Located within development footprint   Private							_											
1262   Silver Maple   Acer saccharinum   16   16   0   0   0   0   0   3   Good   Good   Good   O   Remove   Located within development footprint   Private																		
1263   Silver Maple   Acer saccharinum   13   13   0   0   0   0   0   0   3   Good   Good   Good   O   Remove   Located within development footprint   Private	1262			16	16	0	0	0	0	3	Good	Good	Good	0	Remove	Located within development footprint		
1264         Silver Maple         Acer saccharinum         15         15         0         0         0         0         3         Good         Good         Good         Quality         Located within development footprint         Private           1265         Silver Maple         Acer saccharinum         19         19         0         0         0         3         Good         Good         Good         0         Remove         Located within development footprint         Private           1266         Silver Maple         Acer saccharinum         10         10         0         0         0         3         Good         Good         Good         0         Remove         Located within development footprint         Private           1268         Silver Maple         Acer saccharinum         10         10         0         0         0         3         Good         Good         Ood         0         Remove         Located within development footprint         Private           1268         Silver Maple         Acer saccharinum         11         11         0         0         0         3         Good         Good         0         0         Remove         Located within development footprint         Private	1263					0	0	0	0					0				
1265         Silver Maple         Acer saccharinum         15         15         0         0         0         0         3         Good         Good         0         0         Remove         Located within development footprint         Private           1267         Silver Maple         Acer saccharinum         19         19         0         0         0         3         Good         Good         0         Remove         Located within development footprint         Private           1267         Silver Maple         Acer saccharinum         10         0         0         0         3         Good         Good         0         Remove         Located within development footprint         Private           1268         Silver Maple         Acer saccharinum         11         11         10         0         0         0         3         Good         Good         0         Remove         Located within development footprint         Private           1269         Silver Maple         Acer saccharinum         13         13         0         0         0         3         Good         Good         0         Remove         Located within development footprint         Private           1269         Silver Maple <t< td=""><td></td><td></td><td></td><td>15</td><td>15</td><td>0</td><td>0</td><td>0</td><td>0</td><td>3</td><td></td><td>Good</td><td></td><td>0</td><td></td><td></td><td>Private</td><td></td></t<>				15	15	0	0	0	0	3		Good		0			Private	
1267         Silver Maple         Acer saccharinum         10         10         0         0         0         0         0         3         Good         Good         0         Remove         Located within development footprint         Private           1268         Silver Maple         Acer saccharinum         11         11         0         0         0         3         Good         Good         0         Remove         Located within development footprint         Private           1269         Silver Maple         Acer saccharinum         13         13         0         0         0         3         Good         Good         0         Remove         Located within development footprint         Private				15	15	0		0	0			Good		0	Remove			
1268         Silver Maple         Acer saccharinum         11         11         0         0         0         0         0         3         Good         Good         0         Remove         Located within development footprint         Private           1269         Silver Maple         Acer saccharinum         13         13         0         0         0         3         Good         Good         Good         0         Remove         Located within development footprint         Private		Silver Maple	Acer saccharinum			-	_	-	_		Good	Good	Good	_	Remove	Located within development footprint	Private	
1269 Silver Maple Acer saccharinum 13 13 0 0 0 0 0 3 Good Good 0 Remove Located within development footprint Private														_				
							_		_									
1270   Silver Maple   Acer soccharinum   11   11   0   0   0   0   3   Good   Good   Good   0   Remove   Located within development footprint   Private															Remove			
	1270	Silver Maple	Acer saccharinum	11	11	0	0	0	0	3	Good	Good	Good	0	Remove	Located within development footprint	Private	



Tree ID Number	Species Common Name	Species Scientific Name	Multi-stem DBH <sup>1</sup> (cm)	DBH 1 (cm)	DBH 2 (cm)	DBH 3 (cm)	DBH 4 (cm)	DBH 5 (cm)	Crown Radius (m)	Biological Health	Structural Health	Overall Health	TPZ (m)	Recommended Action	Rationale for Removals	Ownership	Notes
1271	Silver Maple	Acer saccharinum	14	14	0	0	0	0	3	Good	Good	Good	0	Remove	Located within development footprint	Private	
	Silver Maple	Acer saccharinum	10	10	0	0	0	0	3	Good	Good	Good	0	Remove	Located within development footprint	Private	
1273	Silver Maple	Acer saccharinum	15	15	0	0	0	0	3	Good	Good	Good	0	Remove	Located within development footprint	Private	
	Silver Maple Silver Maple	Acer saccharinum Acer saccharinum	19 13	19 13	0	0	0	0	3	Good Good	Good	Good Good	0	Remove Remove	Located within development footprint Located within development footprint	Private Private	
	Silver Maple	Acer saccharinum	15	15	0	0	0	0	3	Good	Good	Good	0	Remove	Located within development footprint	Private	
1277	Silver Maple	Acer saccharinum	11	11	0	0	0	0	3	Good	Good	Good	0	Remove	Located within development footprint	Private	
1278	Silver Maple	Acer saccharinum	18	18	0	0	0	0	3	Good	Good	Good	0	Remove	Located within development footprint	Private	
1279	Silver Maple	Acer saccharinum	28	21	18	0	0	0	3	Good	Good	Good	0	Remove	Located within development footprint	Private	
1280	Silver Maple	Acer saccharinum	15	11	10	0	0	0	3	Good	Good	Good	0	Remove	Located within development footprint	Private	
1281	Silver Maple Silver Maple	Acer saccharinum	14 32	14 28	0 16	0	0	0	3	Good	Good	Good	0	Remove	Located within development footprint Located within development footprint	Private Private	
1282	Silver Maple Silver Maple	Acer saccharinum Acer saccharinum	41	28	18	18	18	14	5	Good Fair	Good Fair	Good Fair	0	Remove Remove	Located within development footprint  Located within development footprint	Private	Multiple stems
1284		Acer saccharinum	60	60	0	0	0	0	5	Good		Good	0	Remove	Located within development footprint	Private	Wideple Stells
1285		Juglans nigra	10	10	0	0	0	0	4	Good		Good	0		Located within development footprint	Private	
1286	Manitoba Maple	Acer negundo	10	10	0	0	0	0	4	Good	Good	Good	0	Remove	Located within development footprint	Private	
1287	Manitoba Maple	Acer negundo	16	16	0	0	0	0	4	Good	Good	Good	0	Remove	Located within development footprint	Private	
1288	Black Walnut	Juglans nigra	16	16	0	0	0	0	4	Good	Good	Good	0	Remove	Located within development footprint	Private	
	Manitoba Maple	Acer negundo	23	16	16	0	0	0	4	Fair	Fair	Fair	0	Remove	Located within development footprint	Private	Codominant stems
1290 1291	Northern Catalpa Manitoba Maple	Catalpa speciosa Acer negundo	55 32	55 32	0	0	0	0	4	Good Good	Good Good	Good Good	0	Remove Remove	Located within development footprint Located within development footprint	Private Private	
1291	White Birch	Betula papyrifera	39	23	20	18	17	0	4	Fair	Fair	Fair	0	Remove	Located within development footprint	Private	Multiple stems; oozing sap on one stem
1293	Eastern White Cedar	Thuja occidentalis	33	33	0	0	0	0	2	Good	Good	Good	0	Remove	Located within development footprint	Private	,
1294	Horse Chestnut	Aesculus hippocastanum	56	56	0	0	0	0	2	Good	Good	Good	0	Remove	Located within development footprint	Private	
1295	Weeping Willow	Salix x sepulcralis	100	100	0	0	0	0	2	Fair	Fair	Fair	0	Remove	Located within development footprint	Private	Cracks at base of limbs
	Manitoba Maple	Acer negundo	11	11	0	0	0	0	2	Fair	Fair	Fair	0	Remove	Located within development footprint	Private	On lean, growing into shed structure
1297	Hybrid Butternut	Juglans cinerea x Juglans	18	18	0	0	0	0	4	Fair	Fair	Fair	0	Remove	Located within development footprint	Private	Canker
1298 1299	Hybrid Butternut Black Walnut	Juglans cinerea x Juglans	25 21	25 21	0	0	0	0	4	Good	Good	Good Good	0	Remove Remove	Located within development footprint Located within development footprint	Private Private	
		Juglans nigra Acer negundo	23	23	0	0	0	0	3	Good Good	Good	Good	0	Remove	Located within development footprint	Private	
1300	Manitoba Maple	Acer negundo	22	22	0	0	0	0	3	Good	Good	Good	0	Remove	Located within development footprint	Private	
1302	Manitoba Maple	Acer negundo	15	15	0	0	0	0	3	Good		Good	0	Remove	Located within development footprint	Private	
1303	Manitoba Maple	Acer negundo	17	17	0	0	0	0	3	Good	Good	Good	0	Remove	Located within development footprint	Private	
1304	Manitoba Maple	Acer negundo	11	11	0	0	0	0	3	Good	Good	Good	0	Remove	Located within development footprint	Private	
1305	Black Walnut	Juglans nigra	18	18	0	0	0	0	3	Good	Good	Good	0	Remove	Located within development footprint	Private	
1306	Eastern White Cedar	Thuja occidentalis	20	20	0	0	0	0	2	Good	Good	Good	_	Remove	Located within development footprint	Private	
1307 1308	Manitoba Maple Manitoba Maple	Acer negundo	14 13	14 13	0	0	0	0	2	Good	Good	Good Good	0	Remove	Located within development footprint  Located within development footprint	Private Private	
	Manitoba Maple	Acer negundo Acer negundo	16	16	0	0	0	0	2	Good	Good Good	Good	0	Remove Remove	Located within development footprint  Located within development footprint	Private	
		Acer negundo	100	100	0	0	0	0	2	Poor	Poor	Poor	0	Remove	Located within development footprint	Private	Crown dieback, most of crown missing, hollowed out stem, rot inside stem
1899	Silver Manle	Acer saccharinum	91	65	63	0	0	0	8	Fair	Fair	Fair	0	Remove	Located within development footprint	Private	Dead limb has been removed, dead branches present, growing between garage and shed
-000	Silver Maple	Acer saccharinum	61	61	0	0	0	0	7	Fair	Good	Fair	0	Remove	Located within development footprint	Private	Metal object grown into stem, dead branches present
		Acer negundo	13	13	0	0	0	0		Fair		Fair		Remove	Located within development footprint	Private	On lean, debris
		Acer negundo	15	15	0	0	0	0		Fair	Fair	Fair	0	Remove	Located within development footprint	Private	On lean, debris
D1 D2	Dead Dead		0	0	0	0	0	0	0			Dead Dead	0	Remove Remove	Located within development footprint Located within development footprint	Private Private	
N1	Black Walnut	Juglans nigra	17	17	0	0	0	0	3	Good	Good	Good	4	Preserve	Located within development rootprint	Neighbour	
	Norway Spruce	Picea abies	25	25	0	0	0	0	3	Good	Good	Good	0	Remove	Located within development footprint	Boundary	
N11	Norway Spruce	Picea abies	40	40	0	0	0	0	3	Good	Good	Good	0	Remove	Located within development footprint	Boundary	
N12	Norway Spruce	Picea abies	24	24	0	0	0	0	3	Good		Good	0	Remove	Located within development footprint	Boundary	
N13	Silver Maple	Acer saccharinum	25	25	0	0	0	0	3	Good	Good	Good	4	Preserve		Neighbour	
N14	Silver Maple	Acer saccharinum	30	30	0	0	0	0	3	Good	Good	Good	4	Preserve		Neighbour	
		Acer saccharinum	30	30	0	0	0	0	3	Good		Good		Preserve		Neighbour	
N2 N3		Juglans nigra	17	17	0	0	0	0		Good	Good	Good	0		Lacated within development featurint	Neighbour	Onlean
N3 N4	Manitoba Maple Manitoba Maple	Acer negundo Acer negundo	34 33	34 24	23	0	0	0	3	Good	Fair Fair	Fair Fair	0	Remove Remove	Located within development footprint Located within development footprint	Boundary Boundary	On lean On lean
N5	Black Walnut	Juglans nigra	17	17	0	0	0	0	3	Good	Good	Good	4	Preserve	cocacca within development rootprint	Neighbour	0.116.01
N6	Manitoba Maple	Acer negundo	24	24	0	0	0	0	3	Good	Good	Good	4	Preserve		Neighbour	
N7	Manitoba Maple	Acer negundo	34	34	0	0	0	0	3	Good	Poor	Poor	0	Remove	Located within development footprint	Boundary	1 m wound on stem
N8	Manitoba Maple	Acer negundo	36	36	0	0	0	0	3	Good	Fair	Fair	4	Preserve		Neighbour	On lean
N9	Manitoba Maple	Acer negundo	34	34	0	0	0	0	3	Good	Fair	Fair	4	Preserve		Neighbour	On lean
W1	Manitoba Maple	Acer negundo	15	15	0	0	0	0	4	Fair	Fair	Fair	0	Remove	Located within development footprint	Private	Debris, on lean
	Black Walnut Black Walnut	Juglans nigra	12 22	12 22	0	0	0	0	1.5 3	Good	Good	Good	0	Remove Remove	Located within development footprint	Private Private	
W11 W12	Black Walnut Black Walnut	Juglans nigra Juglans nigra	12	12	0	0	0	0	1.5	Good	Good	Good Good	0	Remove	Located within development footprint  Located within development footprint	Private	
W13	Black Walnut	Juglans nigra	12	12	0	0	0	0	1.5	Good	Good	Good	0	Remove	Located within development footprint	Private	
W14	White Poplar	Populus alba	70	70	0	0	0	0	4	Poor	Poor	Poor	0	Remove	Located within development footprint	Private	Grown into fence, dead limbs, rubbing limbs
W15	White Poplar	Populus alba	57	40	40	0	0	0	3	Poor	Poor	Poor	0	Remove	Located within development footprint	Private	Bent stems, codominant stems, debris, broken stem
W16	White Poplar	Populus alba	45	45	0	0	0	0	3	Fair	Fair	Fair	0	Remove	Located within development footprint	Private	Bent stem, debris
W17		Acer negundo	16	11	11	0	0	0	3	Fair	Fair	Fair	0	Remove	Located within development footprint	Private	Codominant stems
	Black Walnut	Juglans nigra	15	15	0	0	0	0		Good		Good	0	Remove	Located within development footprint	Private	
	Black Walnut Manitoba Maple	Juglans nigra	15 41	15 28	0 25	0 17	0	0	1.5 4	Good Fair	Good Fair	Good Fair	0	Remove Remove	Located within development footprint	Private Private	Debris, included bark, hollows in stem
vv2	iviatiitoba iviapie	Acer negundo	41	28	25	1/	U	U	4	rdll	rdll	rdll	U	neillove	Located within development footprint	riivate	Debris, included bank, nonows in stem



Tree ID Number	Species Common Name	Species Scientific Name	Multi-stem DBH <sup>1</sup> (cm)	DBH 1 (cm)	DBH 2 (cm)	DBH 3 (cm)	DBH 4 (cm)	DBH 5 (cm)	Crown Radius (m)	Biological Health	Structural Health	Overall Health	TPZ (m)	Recommended Action	Rationale for Removals	Ownership	Notes
W20	Black Walnut	Juglans nigra	17	17	0	0	0	0	1	Good	Good	Good	0	Remove	Located within development footprint	Private	
W21	Black Walnut	Juglans nigra	15	15	0	0	0	0	1.5	Good	Good	Good	0	Remove	Located within development footprint	Private	
W22	Black Walnut	Juglans nigra	13	13	0	0	0	0	1.5	Good	Good	Good	0	Remove	Located within development footprint	Private	
	Black Walnut	Juglans nigra	20	20	0	0	0	0	2	Good	Good	Good	0		Located within development footprint	Private	
W24 W25	Black Walnut	Juglans nigra Juglans nigra	25 12	25	0	0	0	0		Good		Good	0		Located within development footprint	Private	
W26	Black Walnut Black Walnut	Juglans nigra	16	12	11	0	0	0	1	Good	Good	Good	0	Remove Remove	Located within development footprint	Private Private	
W27	Black Walnut	Jualans niara	12	12	0	0	0	0	1	Good	Good	Good	0	Remove	Located within development footprint	Private	
W28	Black Walnut	Juglans nigra	13	13	0	0	0	0	1	Good	Good	Good	0	Remove	Located within development footprint	Private	
W29	Black Walnut	Juglans nigra	20	20	0	0	0	0	2	Good	Good	Good	0	Remove	Located within development footprint	Private	
W3	Black Walnut	Juglans nigra	22	22	0	0	0	0		Good		Good	0	Remove	Located within development footprint	Private	
W30	Black Walnut	Juglans nigra	18	18	0	0	0	0	2	Good		Good	0	Remove	Located within development footprint	Private	
W31	Black Walnut	Juglans nigra	13	13	0	0	0	0	2	Good		Good	0	Remove	Located within development footprint	Private	
W32	Black Walnut	Juglans nigra	23 34	23	0	0	0	0		Good		Good	0	Remove	Located within development footprint	Private	Multiple stome
W33 W34	Black Walnut Black Walnut	Juglans nigra Juglans nigra	25	23 25	20 0	15 0	0	0	3	Fair Fair	Fair	Fair Fair	0	Remove Remove	Located within development footprint  Located within development footprint	Private Private	Multiple stems Tree fallen onto it, included bark
W35	Manitoba Maple	Acer negundo	30	30	0	0	0	0	5	Poor	Poor	Poor	0	Remove	Located within development footprint	Private	Broken limbs, large wounds on main stem
W36	Manitoba Maple	Acer negundo	25	25	0	0	0	0		Fair	Fair	Fair	0	Remove	Located within development footprint	Private	Dead branches, wounds on stem
W37	Manitoba Maple	Acer negundo	10	10	0	0	0	0	2	Fair	Fair	Fair	0	Remove	Located within development footprint	Private	Multiple stems
W38	Manitoba Maple	Acer negundo	42	30	30	0	0	0	5	Poor	Poor	Poor	0	Remove	Located within development footprint	Private	Limbs growing horizontally and sprawling, broken limbs at base, splits and wounds
W39	Norway Maple	Acer platanoides	28	28	0	0	0	0	2	Fair	Fair	Fair	0	Remove	Located within development footprint	Private	Wound along stem
W4	Black Walnut	Juglans nigra	22	22	0	0	0	0	3	Good	Good	Good	0	Remove	Located within development footprint	Private	
W40	Manitoba Maple	Acer negundo	45	45	0	0	0	0	4	Poor	Poor	Poor	0	Remove	Located within development footprint	Private	Growing horizontally, twisted and bent stem, suckering
	Black Walnut	Juglans nigra	12	12	0	0	0	0	1.5			Good	0		Located within development footprint	Private	
W42	Black Walnut	Juglans nigra	15	15	0	0	0	0		Good		Good	0	Remove	Located within development footprint	Private	
W43	Manitoba Maple	Acer negundo	15	15	0	0	0	0	1.5	Good	Good	Good	0	Remove	Located within development footprint	Private	
W44	Black Walnut	Juglans nigra	17	17	0	0	0	0	1.5	Good	Good	Good	0	Remove	Located within development footprint	Private	0-1
W45 W46	Manitoba Maple	Acer negundo Acer negundo	34 25	30 25	15 0	0	0	0		Fair	Fair Fair	Fair	0	Remove Remove	Located within development footprint	Private	On lean
W47	Manitoba Maple Manitoba Maple	Acer negundo	22	22	0	0	0	0	2.5	Fair Fair	_	Fair Fair	0	Remove	Located within development footprint Located within development footprint	Private Private	On lean On lean
W48	Manitoba Maple	Acer negundo	15	15	0	0	0	0		Fair		Fair	0	Remove	Located within development footprint	Private	On lean
W49	Black Walnut	Jualans niara	12	12	0	0	0	0		Good		Good	-	Remove	Located within development footprint	Private	onicali
W5	Black Walnut	Juglans nigra	15	15	0	0	0	0	1.5			Good		Remove	Located within development footprint	Private	Debris
W50	Black Walnut	Juglans nigra	12	12	0	0	0	0		Good	Good	Good	0	Remove	Located within development footprint	Private	
W51	Black Walnut	Juglans nigra	10	10	0	0	0	0	1.5		Good	Good	0	Remove	Located within development footprint	Private	
W52	Black Walnut	Juglans nigra	11	11	0	0	0	0	_	Good	Good	Good	0	Remove	Located within development footprint	Private	
W53	Black Walnut	Juglans nigra	13	13	0	0	0	0	1.5	Good	Good	Good	0	Remove	Located within development footprint	Private	
W54	Black Walnut	Juglans nigra	11	11	0	0	0	0		Good	Good	Good	0	Remove	Located within development footprint	Private	
W55	Black Walnut	Juglans nigra	11	11	0	0	0	0		Good		Good	0	Remove	Located within development footprint	Private	
W56 W57	Black Walnut Black Walnut	Juglans nigra	15 17	15 17	0	0	0	0		Good		Good	0	Remove	Located within development footprint	Private Private	
	Black Walnut	Juglans nigra Juglans nigra	1/	1/	0	0	0	0	1.5	Good Good	Good	Good Good	0	Remove Remove	Located within development footprint Located within development footprint	Private Private	
	Black Walnut	Juglans nigra	12	12	0	0	0	0	1.5			Good	0	Remove	Located within development footprint	Private	
W6	Black Walnut	Juglans nigra	13	13	0	0	0	0	1.5		Fair	Fair	0	Remove	Located within development footprint	Private	Debris
W60	Black Walnut	Juglans nigra	15	15	0	0	0	0		Good		Good	0	Remove	Located within development footprint	Private	ocono.
W61	Black Walnut	Juglans nigra	23	18	15	0	0	0		Good		Good	0	Remove	Located within development footprint	Private	
W62	Black Walnut	Juglans nigra	20	20	0	0	0	0	1.5	Good	Good	Good	0	Remove	Located within development footprint	Private	
W63	Black Walnut	Juglans nigra	15	15	0	0	0	0	1.5	Good	Good	Good	0	Remove	Located within development footprint	Private	
W64	Black Walnut	Juglans nigra	16	12	10	0	0	0		Good	Good	Good	0	Remove	Located within development footprint	Private	
W65	Black Walnut	Juglans nigra	17	12	12	0	0	0		Good		Good	0	Remove	Located within development footprint	Private	
W66	Black Walnut	Juglans nigra	12	12	0	0	0	0	1.5	Good		Good	0	Remove	Located within development footprint	Private	
W67 W68	Black Walnut Black Walnut	Juglans nigra Juglans nigra	17 14	17 14	0	0	0	0	1.5	Good		Good Good	0	Remove Remove	Located within development footprint  Located within development footprint	Private Private	
W68 W69	Black Walnut	Juglans nigra Juglans nigra	20	20	0	0	0	0	1.5			Good	0		Located within development footprint  Located within development footprint	Private	
W7	Black Walnut	Juglans nigra	15	15	0	0	0	0		Good		Good	0	Remove	Located within development footprint	Private	
W70	Black Walnut	Juglans nigra	21	15	15	0	0	0		Fair	Fair	Fair	0	Remove	Located within development footprint	Private	Codominant stems
W71	Black Walnut	Juglans nigra	15	15	0	0	0	0	1.5	Fair	Fair	Fair	0	Remove	Located within development footprint	Private	Codominant stems
W72	Silver Maple	Acer saccharinum	10	10	0	0	0	0	1.5	Good	Good	Good	0	Remove	Located within development footprint	Private	
W73	Silver Maple	Acer saccharinum	10	10	0	0	0	0	1.5	Good	Good	Good	0	Remove	Located within development footprint	Private	
	Silver Maple	Acer saccharinum	13	13	0	0	0	0		Good	Good	Good	0	Remove	Located within development footprint	Private	
	Silver Maple	Acer saccharinum	10	10	0	0	0	0		Good	Good	Good	0	Remove	Located within development footprint	Private	
W76	Silver Maple	Acer saccharinum	10	10	0	0	0	0	1.5	Good	Good	Good	0	Remove	Located within development footprint	Private	
	Silver Maple	Acer saccharinum	10	10	0	0	0	0	1.5			Good	0	Remove	Located within development footprint	Private	
	Silver Maple Silver Maple	Acer saccharinum Acer saccharinum	15 10	15 10	0	0	0	0		Good		Good	0	Remove Remove	Located within development footprint	Private Private	
W/9 W8	Silver Maple Black Walnut		10	10	0	0	0	0	1.5	Good Fair		Good Fair	0		Located within development footprint  Located within development footprint	Private Private	Stom rot
W80	Silver Maple	Juglans nigra Acer saccharinum	10	10	0	0	0	0		Good	Fair Good	Good	0	Remove Remove	Located within development footprint  Located within development footprint	Private Private	Stem rot
W81	Silver Maple	Acer saccharinum	13	13	0	0	0	0	1.5	Good	Good	Good	0	Remove	Located within development footprint	Private	
W82	Silver Maple	Acer saccharinum	10	10	0	0	0	0	1.5	Good	Good	Good	0	Remove	Located within development footprint	Private	
W83	Silver Maple	Acer saccharinum	17	17	0	0	0	0		Good		Good	0	Remove	Located within development footprint	Private	
W84	Silver Maple	Acer saccharinum	10	10	0	0	0	0		Good		Good	0	Remove	Located within development footprint	Private	
	Silver Maple	Acer saccharinum	10	10	0	0	0	0	1.5	Good	Good	Good	0	Remove	Located within development footprint	Private	
W85	Silver iviapie			15			0	0	1.5		Good	Good		Remove	Located within development footprint	Private	



Tree ID Number	Species Common Name	Species Scientific Name	Multi-stem DBH <sup>1</sup>	DBH 1 (cm)	DBH 2 (cm)	DBH 3 (cm)	DBH 4 (cm)	DBH 5 (cm)	Crown Radius (m)	Biological Health	Structural Health	Overall Health	TPZ (m)	Recommended Action	Rationale for Removals	Ownership	Notes
W87	Silver Maple	Acer saccharinum	(cm) 15	15	0	0	0	0		Good	Good	Good		Remove	Located within development footprint	Private	
W88	Silver Maple	Acer saccharinum	10	10	0	0	0	0	1.5	Good	Good	Good	0	Remove	Located within development footprint	Private	
		Juglans nigra	20	20	0	0	0	0		Good		Good			Located within development footprint	Private	
															·		
Notes:																	
1: Square	root of the sum of each st	tem squared															
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## Appendix C

**Hybrid Butternut Laboratory Results** 



# CANADIAN CENTRE FOR DNA BARCODING DNA Testing Laboratory Report

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Date of issue: April 12, 2022

### **CLIENT INFORMATION**

Client Name: James Leslie, Senior Vegetation Ecologist

Client Address: GEI Consultants

100 Ahrens St. West | Suite 201 Kitchener, ON N2H 4C3

Contact Name: James Leslie (jleslie@geiconsultants.com)

#### **ITEMS**

Description: Six samples (twigs) from putative butternut submitted for hybrid detection.

Sample ID	Sample ID	Process ID
	provided	
CCDBFR0695	Hamilton 1	ABCBF714-22
CCDBFR0696	Hamilton 2	ABCBF715-22
CCDBFR0697	Pickering BN1	ABCBF716-22
CCDBFR0698	Pickering BN2	ABCBF717-22
CCDBFR0699	Pickering BN3	ABCBF718-22
CCDBFR0700	Pickering BN4	ABCBF719-22

Dates Received: March 22, 2022

Sample Received by: Maria Kuzmina – Research Associate, Plant Lead in person from James Leslie

Dates of Analysis: March 29-April 07, 2022

Analyzed by: Nguyen NguyenTX. / Canadian Centre for DNA Barcoding, Biodiversity of Ontario,

University of Guelph, 50 Stone Road East, Guelph

#### **METHODS**

To ascertain the identity of the species from the submitted samples, an approximate 2mm by 2mm area of bud from each sample was subsampled using sterile techniques. The samples were ground to a fine powder and then lysed. Total genomic DNA was extracted using validated spin column DNA extraction protocol. Two target genetic markers: the second internal transcribed spacer from the nuclear ribosomal DNA (ITS2), and an intergenic spacer between the chloroplast genes trnL and trnF (trnL-trnF) were amplified by using the Polymerase Chain Reaction (PCR) with the primers ITS S2F/ITS4 and trnLUAA-c/trnFGAA-f, respectively; followed by cycle sequencing with standardized commercially available BigDye Terminator v3.1 kit. Sequencing reactions were analyzed by high-voltage capillary electrophoresis using the automated ABI 3730xL DNA Analyzer. Bidirectional forward and reverse sequences were generated for each amplicon. Resulting trace files were assembled into contigs and consensus sequences, and then manually edited in CodonCode Aligner (version 4.1.1.) software. The sequences of ITS2 and trnL-trnF were compared against the BOLD reference libraries. Based on the percentage of nucleotide sequence divergence (a number of nucleotide substitutions) between sequence from the test sample and reference DNA barcode, the closest match was used to infer species identity of the corresponding test samples provided by the contributor. The quality of the sequence traces for ITS2 was done by visual inspection to resolve hybridization. Images, sequences, and their associated trace files with quality scores were uploaded to the secure BOLD project called "CCDB forensic sampling [ABCBF]".

#### **IMAGING**

The items were photographed in the Photography Lab Area by Nguyen NguyenTX., using a Canon ELPH 300 HS, 12.1 megapixels. Pictures were uploaded to the BOLD website into a secure project called "CCDB forensic sampling [ABCBF]". See Appendix 1 for item images.

#### **INTERPRETATION**

Based on the number of nucleotide substitutions between sequence from the test sample and reference DNA barcode, the closest match was used to infer species identity for the corresponding test samples provided by the contributor. The ITS2 base calls for diagnostic sites in the trace file chromatograms were used to resolve hybridization.

The ITS2 marker demonstrated five nucleotide substitutions between *Juglans cinerea* (white walnut) and *Juglans ailantifolia* (Japanese walnut) reference sequences across the amplified ~344 base pair length. Unlike the plastid genome, ribosomal nuclear DNA is inherited by both maternal and paternal organisms. Thus, hybridization event is reflected in the trace file chromatograms as mixed signals at the characteristic nucleotide positions. Therefore, the ITS2 DNA barcode is useful for detection of hybridization event between species.

The *trnL-trnF* marker demonstrated five nucleotide substitutions between *Juglans cinerea* (white walnut) and *Juglans ailantifolia* (Japanese walnut) reference sequences across the target ~950 base pair length. This marker is used as a supplementary marker to confirm species identity for the provided samples. Because it is a part of the chloroplast genome, it is inherited maternally. It confirms the maternal lineage in a hybrid but on its own does not detect hybridization event.

#### **RESULTS**

Sample ID	Sample ID provided	Process ID	Lab Results/Hybridity detected
CCDBFR0695	Hamilton 1	ABCBF714-22	Yes
CCDBFR0696	Hamilton 2	ABCBF715-22	Yes (F2 backcross hybrid)
CCDBFR0697	Pickering BN1	ABCBF716-22	No
CCDBFR0698	Pickering BN2	ABCBF717-22	No
CCDBFR0699	Pickering BN3	ABCBF718-22	No
CCDBFR0700	Pickering BN4	ABCBF719-22	No

The full length ITS2 and *trnL-trnF* genetic markers (~344 base pairs and ~950 base pairs, respectively) for all samples were aligned against the known reference sequences for *Juglans cinerea* (white walnut, butternut), *Juglans ailantifolia* (Japanese walnut), and their hybrid *Juglans cinerea* x *Juglans ailantifolia*. The alignments were analyzed by visual comparison, and by building the Neighbor Joining (NJ) phylogenetic trees using BOLD (Figures 1-8).

#### ITS2

The chromatograms for the sample CCDBFR0695 matched the reference chromatograms for the hybrid *Juglans cinerea x Juglans ailantifolia* (Figures 1, 2, and 3). The analyzed samples revealed mixed base calls at the nucleotide positions, which are diagnostic for two species in question. This base call pattern is consistent with hybridization between two parental organisms of *Juglans cinerea* and *Juglans ailantifolia*.

The chromatograms for the samples from CCDBFR0696 to CCBDFR700 matched with the references of *Juglans cinerea* (white walnut), showing no evidence of mixed base calls at the nucleotide positions, which are diagnostic for two species in question (Figures 1, 2, 3, and 4).

#### trnL-trnF

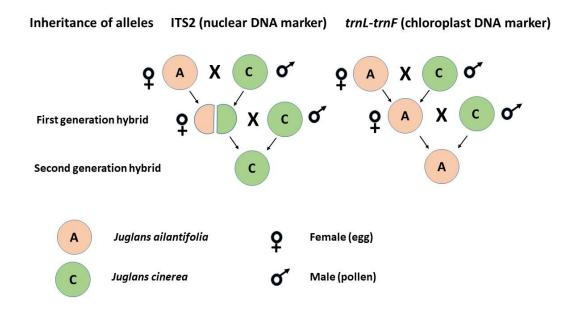
The analysis of *trnL-trnF* sequences showed that the maternal organism for the provided samples CCDBFR0695 and CCDBFR0696 belong to *Juglans ailantifolia* with five nucleotide substitutions (across the amplified length of the marker) differentiating it from *Juglans cinerea*. As shown in Figures 5, 6, 7, and 8 samples CCDBFR0695 and CCDBFR0696 match those of reference sequences for *Juglans ailantifolia*.

The analysis of *trnL-trnF* sequences confirmed that the four provided samples (CCDBFR0697-CCBDFR700) match with *Juglans cinerea* (white walnut) with five nucleotide substitutions (across the amplified length of the marker) differentiating it from *Juglans ailantifolia* (Japanese walnut) as shown in Figure 5, 6, 7 and 8.

#### **CONCLUSIONS**

The present testing indicated that the provided sample CCDBFR0695 <u>is a first-generation hybrid</u> between *Juglans cinerea x Juglans ailantifolia*. The maternal organism for this sample was *Juglans ailantifolia* (Japanese walnut).

The sample CCDBFR0696 inherited its nuclear (ITS2) and chloroplast (trnL-trnF) DNA copies from two different species: Juglans cinerea (ITS2) and Juglans ailantifolia (trnL-trnF). Because the trace chromatograms for this sample showed no evidence of mixed base calls, it indicates that it is a a second generation cross between the first-generation hybrid Juglans cinerea x Juglans ailantifolia with paternal Juglans cinerea (or another hybrid with heterozygous alleles of ITS2). The maternal parental hybrid carried heterozygous alleles of ITS2 (Juglans cinerea and Juglans ailantifolia) and inherited the maternal allele from Juglans ailantifolia. In this case the specimen CCDBFR0696 inherited the same chloroplast DNA from its maternal hybrid organism (trnL-trnF from Juglans ailantifolia) and the allele of ITS2 from Juglans cinerea. The second allele of ITS2 came from the other parent, presumably Juglans cinerea. Two identical alleles did not show any evidence of mixed base calls in the chromatograms. The diagram below illustrates two types of inheritance for the nuclear (ITS2) and chloroplast (trnL-trnF) DNA markers and provides graphical explanation of the observed test results. Therefore, our analysis showed that the sample CCDBFR0696 is the hybrid backcross with one parental species.



Both ITS2 and *trnL-trnF* sequences for the samples CCDBFR0697, CCDBFR0698, CCDBFR0699, and CCDBFR0700 are identical to the reference sequences for *Juglans cinerea*, known as white walnut. The trace chromatograms showed no evidence of hybridization in these samples. The samples CCDBFR0697, CCDBFR0698, CCDBFR0699, and CCDBFR0700 are <u>not</u> hybrids.

#### **RESULTS REPORTED BY:**

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All inquiries pertaining to this report should be directed to Nguyen NguyenT.X. (n.nguyen@uoguelph.ca) and Evgeny V. Zakharov (zakharov@uoguelph.ca). This report should not be reproduced, except in full, without written approval of the CCDB.

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#### **FIGURES**



Figure 1. ITS2 sequence comparison of samples CCDBFR0695 – CCDBFR700 and *Juglans cinerea*, *Juglans ailantifolia*, and hybrid *Juglans cinerea* x *Juglans ailantifolia* reference sequences from the BOLD reference library at the base ~99 and ~103.



Figure 2. ITS2 sequence comparison of samples CCDBFR0695 – CCDBFR700 and *Juglans cinerea*, *Juglans ailantifolia*, and hybrid *Juglans cinerea* x *Juglans ailantifolia* reference sequences from the BOLD reference library at the base ~182.

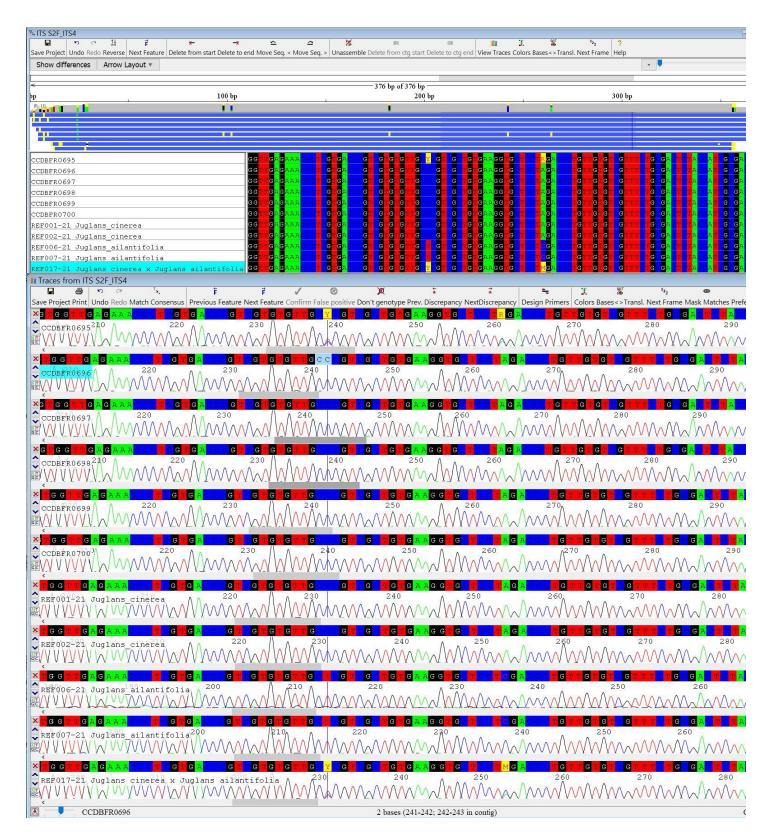


Figure 3. ITS2 sequence comparison of samples CCDBFR0695 – CCDBFR700 and *Juglans cinerea*, *Juglans ailantifolia*, and hybrid *Juglans cinerea* x *Juglans ailantifolia* reference sequences from the BOLD reference library at the base ~242 and ~264.



Figure 4. NJ phylogenetic tree of ITS2 sample sequences CCDBFR0695 – CCDBFR700 and *Juglans cinerea*, *Juglans ailantifolia*, and hybrid *Juglans cinerea* x *Juglans ailantifolia* reference sequences from the BOLD reference library.



Figure 5. trnL-trnF sequence comparison of samples CCDBFR0695 – CCDBFR700 and Juglans cinerea, Juglans ailantifolia, and hybrid Juglans cinerea x Juglans ailantifolia reference sequences from the BOLD reference library at the base ~200 and ~276.

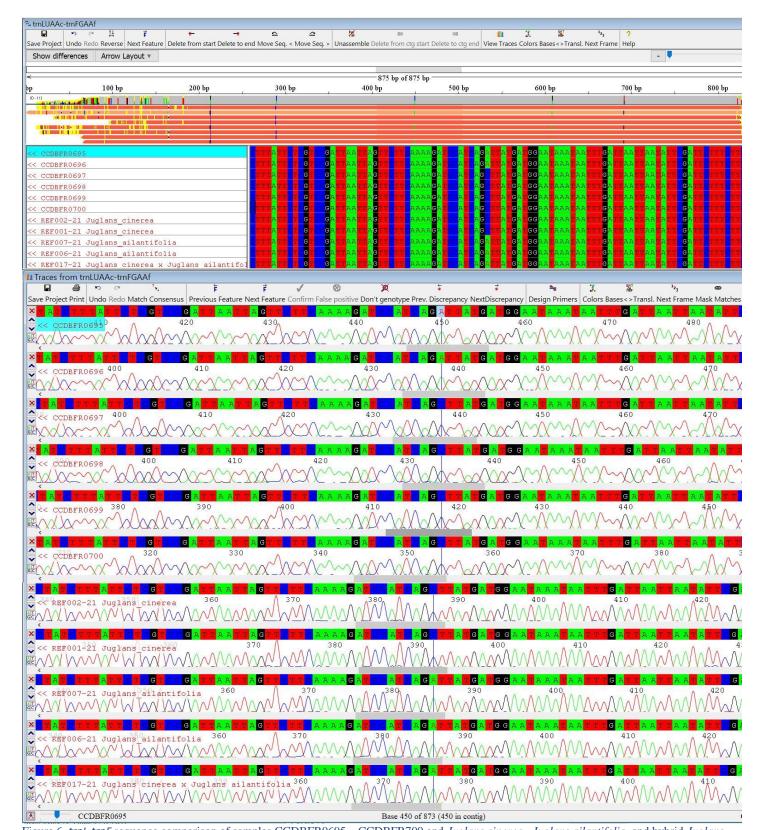


Figure 6. *trnL-trnF* sequence comparison of samples CCDBFR0695 – CCDBFR700 and *Juglans cinerea*, *Juglans ailantifolia*, and hybrid *Juglans cinerea* x *Juglans ailantifolia* reference sequences from the BOLD reference library at the base ~436.

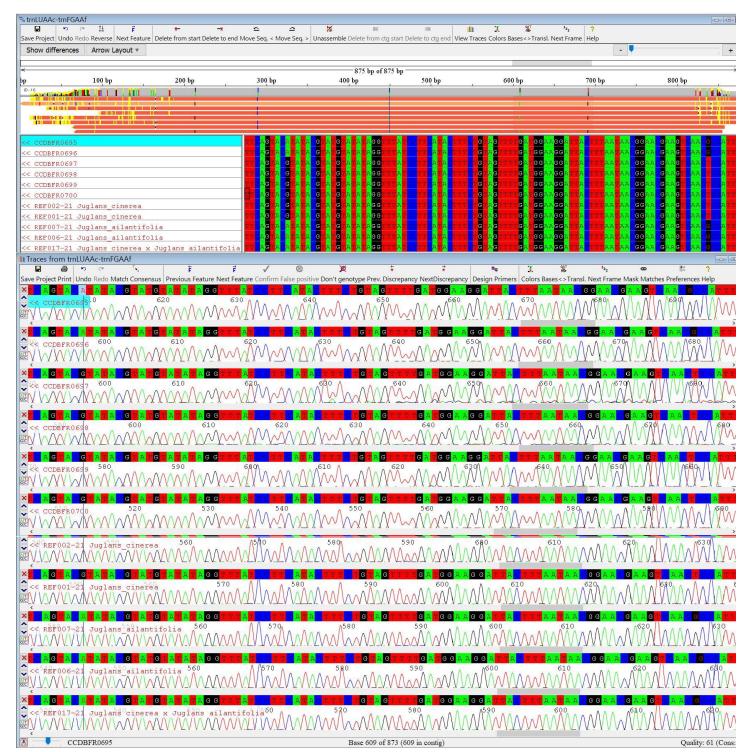


Figure 7. trnL-trnF sequence comparison of samples CCDBFR0695 – CCDBFR700 and Juglans cinerea, Juglans ailantifolia, and hybrid Juglans cinerea x Juglans ailantifolia reference sequences from the BOLD reference library at the base ~595 and ~678.



Figure 8. NJ phylogenetic tree of *trnL-trnF* sample sequences CCDBFR0695 – CCDBFR700 and *Juglans cinerea*, *Juglans ailantifolia*, and hybrid *Juglans cinerea x Juglans ailantifolia* reference sequences from the BOLD reference library.

### **Appendix 1. Image Inventory**



Image 1 – Samples CCDBFR0695.

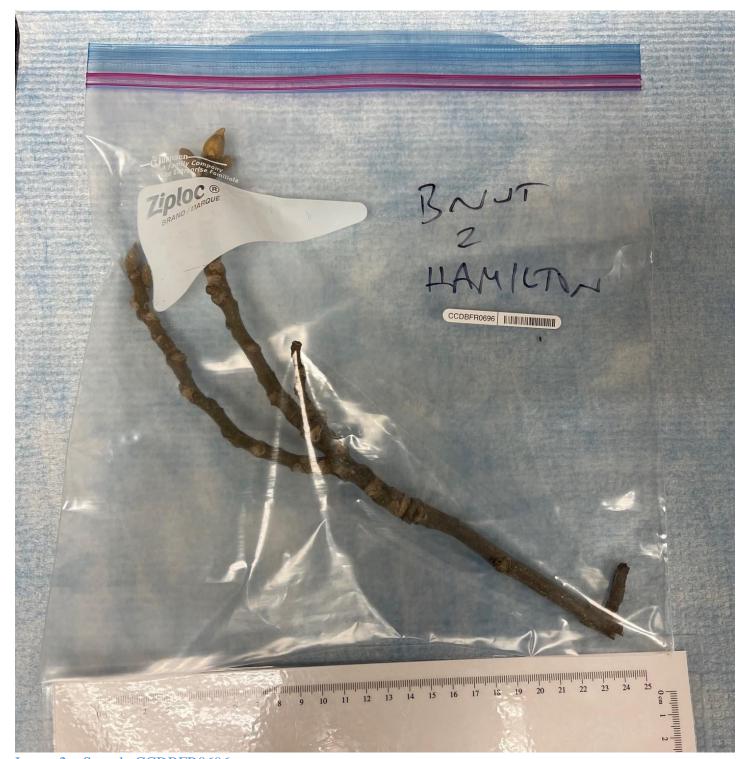


Image 2 – Sample CCDBFR0696.



Image 3 – Sample CCDBFR0697.

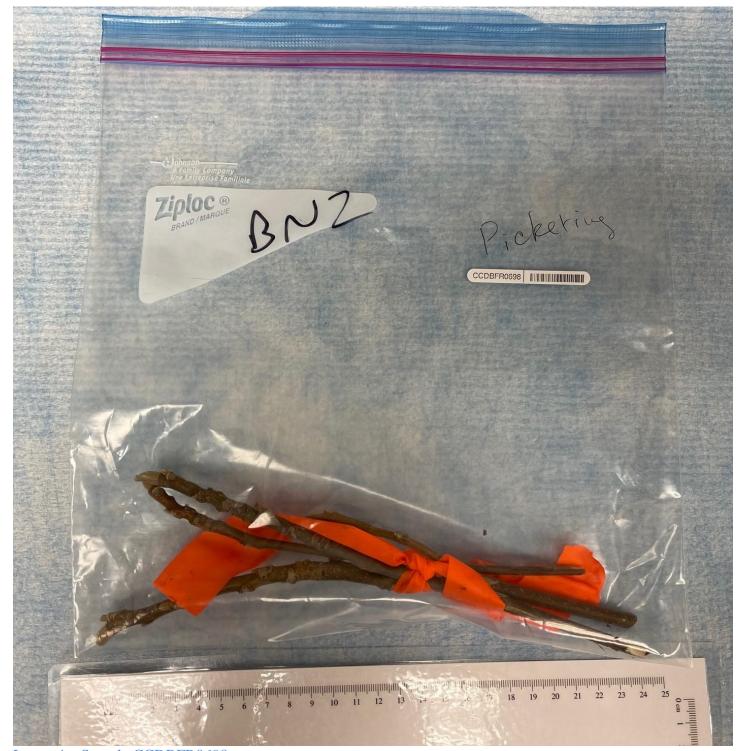


Image 4 – Sample CCDBFR0698.

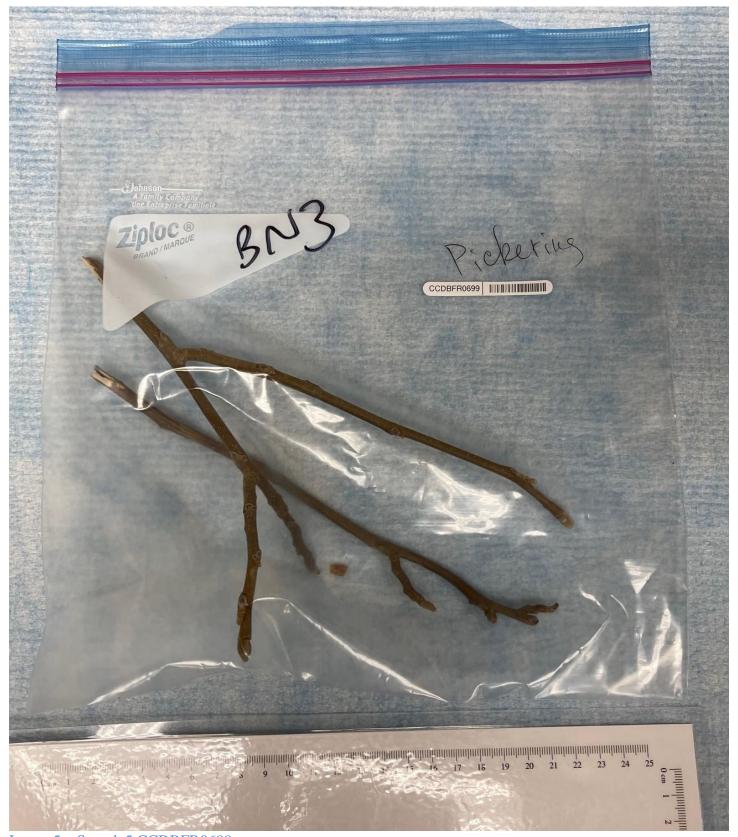


Image 5 – Sample5 CCDBFR0699.

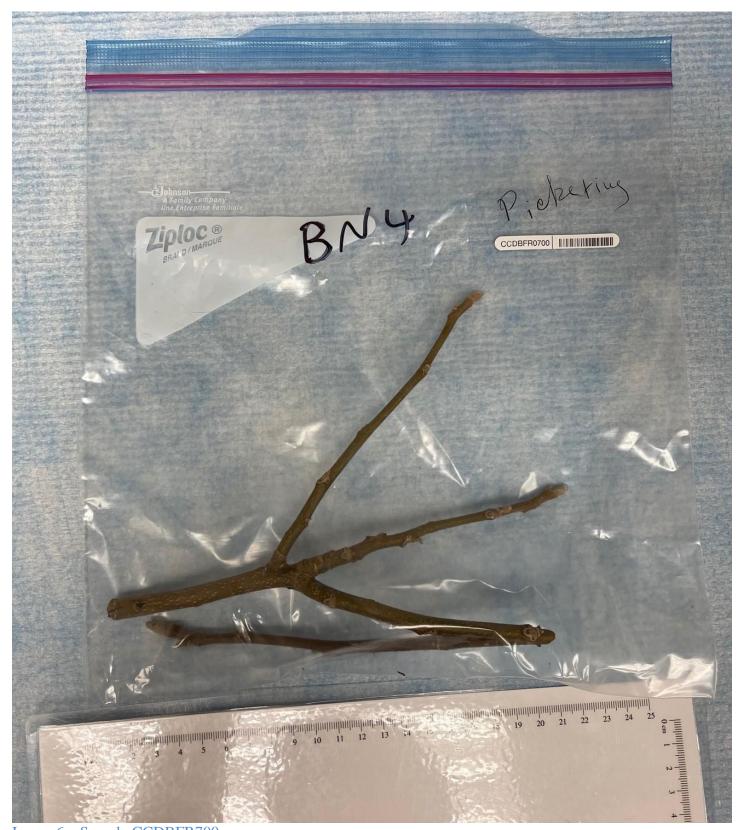


Image 6 – Sample CCDBFR700

# Appendix D

**Tree Preservation Details** 

## **APPENDIX 8**

**Tree Preservation Details** 

