City of Richmond

Report to Committee

To:	Planning Committee	**Date:**	November 4, 2019
From:	Wayne Craig Director, Development	**File:**	AG 18-842960
Re:	**Application by Dagneault Planning Consultants Ltd. for ALR Non-Farm Use at 9500 No. 5 Road**		

Staff Recommendation

That the Agricultural Land Reserve application by Dagneault Planning Consultants Ltd. at 9500 No. 5 Road to allow non-farm uses for the development of a school and accessory supporting uses on the westerly 110 m of the site and undertake agricultural improvement works and implement the farm plan on the remaining backlands portion of the site, as outlined in the report dated November 4, 2019 from the Director of Development, be endorsed and forwarded to the Agricultural Land Commission.

Wayne Craig
Director, Development

WC:ke
Att. 7

REPORT CONCURRENCE
CONCURRENCE OF GENERAL MANAGER

Staff Report

Origin

Dagneault Planning Consultants Ltd, on behalf of the owner of subject site, has made an Agricultural Land Reserve (ALR) non-farm use application to the Agricultural Land Commission (ALC) for permission to develop an independent school with accessory supporting uses on the westerly 110 m of the subject site. Agricultural improvement works are also proposed to convert the remaining backlands portion of the site from their previous use as a golf course to farmland that is proposed to be leased to a local farmer to undertake implementation of an organic farm plan on the site.

This ALR non-farm use application requires consideration and endorsement by Richmond City Council prior to the application being forwarded to the ALC for consideration. If this application is endorsed by Council, the application will be forwarded to the ALC; should Council not grant approval to the application, it will not proceed further. The ALC is the sole decision making authority for ALR applications that are forwarded to them. Should Council endorse this proposal and the ALC approve this ALR non-farm use application, a rezoning application will also be required for this proposal. Subject to the outcome of the ALR non-farm application, the rezoning application would apply zoning that would allow the school and related activities on the front portion of the site and only allow agricultural uses on the backlands. The existing golf course zoning would be removed from the site through this rezoning application. Any reference to the future rezoning application process for this proposal contained in this report is subject to Council and ALC consideration and approval of the ALR non-farm use application.

The subject site is approximately 12.16 ha (30 ac) in area (Attachment 1). The ALR non-farm use area proposed for the school consists of the westerly 110 m of the subject site and is approximately 4.34 ha (10.7 ac) in area. The westerly 110 m is measured from the site's west property line (No. 5 Road), with future anticipated road dedications taken into account (Attachment 2).

Project Description

The subject site is located in the ALR and is currently zoned "Golf Course (GC)". Previously the site was operated as the former Mylora Golf Course facility, which ceased operation in 2012. The owner of the site is proposing to develop a school on the 4.34 ha (10.7 ac) area on the west portion of the site directly adjacent to No.5 Road.

The owner of the subject site currently operates an independent school in Richmond (Pythagoras Academy located on Odlin Crescent) where they offer kindergarten to grade 7 program curriculum in an existing facility on land that they currently lease. The applicant has indicated that Pythagoras Academy intends to establish a permanent facility for their school on the subject site at 9500 No. 5 Road with plans to expand their school programming to a full curriculum from kindergarten to grade 12. The applicant has also indicated that their agreement to lease the current facility and site on Odlin Crescent will end in October 2022. This proposal on the subject site would facilitate Pythagoras Academy's objective to establish and develop a

permanent site to allow for the continued growth and expansion of their independent school in Richmond.

The applicant's proposal for the entire site contains two components that are summarized as follows:

- On the westerly 4.34 ha (10.7 ac) area of the site, development of an independent school that offers kindergarten to grade 12 curriculum and programs, uses and facilities to support the school (i.e., administration, gymnasium, cafeteria, auditorium/theatre) that could accommodate approximately 950 students. Outside of the facility and buildings are areas for vehicle off-street parking areas, vehicle circulation/drop-off, outdoor play/recreation/program areas and buffer/setback spaces to adjacent uses. A density of 0.5 FAR and a building height of 12 m (39 ft.) is proposed for the school, which is consistent with the parameters of the "Assembly (ASY)" zoning district. The proposed total floor area for the school based on this density is approximately 21,199 sq. m (228,184 sq. ft.)(Refer to Attachment 3 for a conceptual site plan).
- On the remaining backlands area of the site (7.6 ha or 18.8 ac), agricultural works and improvements to convert the previous golf course lands to a farm site that the owner is proposing to lease to an organic farmer. Subject to the outcome of the ALR non-farm use application, the backlands would also be rezoned to allow agricultural uses and remove the golf course zoning/use from the site.

Past Development Application Proposal

A previous ALR non-farm use application (AG 13-646237) was made by a different owner for the subject site that was endorsed by Council on May 24, 2016. This proposal involved subdivision of the subject site to allow for the creation of five lots fronting No. 5 Road (each approximately 0.8 ha or 2 acres in area) and requested permission to use and develop these lots into future community institutional uses. A component of this previous application involved dedication of the remaining backlands to the City. This ALR non-farm use application was denied by the ALC on April 27, 2017.

Surrounding Development

The subject site is primarily vacant and contains the remaining buildings, facilities and improvements associated with the previous golf course operation that ceased operations in 2012.

To the North: An unopened road allowance (King Road) that currently has a 15 m Riparian Management Area designation for an existing open watercourse running the length of the site from No. 5 Road to Highway 99. North of the unopened road allowance is a vacant site with "Assembly (ASY)" zoning.

To the South: A site with "Religious Assembly (ZIS7)" zoning associated with the Lingyen Mountain Temple (existing and future temple expansion) that was approved through a rezoning application (RZ 13-641554). The land to the south also has "Agriculture (AG1)" zoning containing the agricultural activities operated by the temple.

To the East: Highway 99 (Ministry of Transportation and Infrastructure).

To the West: West of No. 5 Road, single-family homes zoned "Single-Detached" RS1/E)" and identified for Townhouses under the City's Official Community Plan Arterial Road Policy.

Related Policies & Studies

Official Community Plan Land Use Designation and No. 5 Road Backlands Policy

The Official Community Plan (OCP) designates the westerly 110 m (361 ft.) of the subject site for Community Institutional and the remaining backland portion of the site for Agriculture. The proposed ALR non-farm use application to request permission for a school on the Community Institutional designated portion of the site complies with the OCP. The proposal to undertake works and improvements to the agricultural backlands and actively farm this area is consistent with the 'Agriculture" OCP designation for the rear portion of the site.

The OCP No. 5 Road Backlands Policy (Attachment 4) provides further direction in relation to proposals for Community Institutional related development on the westerly 110 m (361 ft.) for sites within the policy area. These policies are intended to outline general objectives for development on the frontlands and farming on the backlands while also outlining a number of options available to property owners/applicants to remove constraints and to facilitate farming of the backlands.

The proposal for the owner to undertake agricultural works and improvements necessary to convert the land from its previous use as a golf course to a farm capable of supporting a wide range of soil-based crops is consistent with the OCP No. 5 Road Backlands Policy. The applicant also proposes to lease the land upon completion of the agricultural improvement works to an organic farmer who would then develop and implement a farm plan to establish agricultural production over the backlands area. Provisions to secure implementation of the agricultural improvement works and farm plan would be through the rezoning application and are discussed in greater detail in the "Analysis" section of this report. To allow access to the backlands, provisions for farm only access in the form of a minimum standard farm road from No. 5 Road and along the entire backlands portion of the site is included in this proposal. This approach to achieve active farming of the backlands, complies with the OCP No. 5 Road Backlands Policy.

Floodplain Management Implementation Strategy

The Richmond Flood Plain Designation and Protection Bylaw 8204 applies to this proposal. The project's response to comply with this bylaw will be addressed through the processing of the rezoning application.

Riparian Management Area (15 metres)

A provincially designated Riparian Management Area (RMA – 15 m) is located on the subject site's north property line for an existing watercourse located within the King Road allowance. A

15 m RMA also exists to the east for an existing watercourse contained within the Highway 99 right-of-way. The RMA to the east does not impact the subject site as the 15 m setback is fully contained within the Ministry of Transportation and Infrastructure controlled highway right-of-way. Provincial Riparian Area Regulations do not apply to institutional uses (i.e., schools) or agricultural activities.

Although the proposed school (institutional) development and agricultural uses are not subject to the Provincial Riparian Area Regulations, the applicant's Qualified Environmental Professional (QEP) proposes an approach to provide a vegetated buffer/setback area for the school and agricultural uses. Proposed site plan drawings show a vegetated setback buffer of a minimum of 6 m (20 ft.) wide for the school building and related uses. Additional information on the proposed approach for the RMA to the north of the site, including details on proposed plantings and enhancements recommended by the applicant's QEP, would be provided at time of future rezoning.

Ministry of Transportation and Infrastructure

As the site is immediately adjacent to a provincial highway and near a provincially controlled highway interchange, referral of this proposal to the Ministry of Transportation and Infrastructure (MOTI) would occur through the processing of the rezoning application. Any comments received from Ministry staff would be provided to Council through the rezoning.

Public Consultation

Food Security and Agricultural Advisory Committee

The proposal was presented to the Food Security and Agricultural Advisory Committee (FSAAC) on September 12, 2019 (An excerpt of the FSAAC minutes is contained in Attachment 5). The FSAAC supported the proposal and provided the following comments for consideration by the applicant:

- Consider retaining a portion of the proposed school site for agricultural programming for students; and
- Consider providing space within the proposed school site for non-profit organizations.

In response to the FSAAC comments, the applicant has incorporated a space within the proposed landscape open space for the school to be used to support agricultural programming and education in the school. Additional details on the agricultural programming and layout of this space would be determined through the processing of a future rezoning application, if supported by Council and the ALC.

The applicant also indicates that the school (Pythagoras Academy) is open to requests for temporary use of their school facilities by various community groups/non-profit organizations, but would be subject to the schools final programming and space needs that remain under development.

ALR Non-Farm Use and Rezoning Application – Notification and Public Consultation

While there is no formal requirement for a notification sign on-site, a sign has been voluntarily placed on the subject site, providing notification of the ALR non-farm use application and information on the proposed school development and agricultural related works and activities. To date, staff have not received any public correspondence on this proposal.

Should this application advance, public notification will be conducted for any future rezoning application, including a public hearing, and will provide the public an opportunity to comment further on the proposal.

Analysis

Proposed Agricultural Remediation and Farm Implementation Plan for Backlands

The approach to achieve active farming of the backlands for this proposal can be categorized into agricultural improvement works, farm access and farm plan implementation with details provided in the following sections. The consulting agrologist reports on the backlands specific to agricultural improvement works, farm access and farm plan implementation is contained in Attachment 6 for reference purposes.

Agricultural Improvement Works

A summary of the agricultural improvement works recommended by the consulting agrologist for specific works and improvements to remediate a portion of the site that had previously been a golf course, to a condition that would improve the site's overall agricultural capability and support a wide range of farm crops. The proposed works are summarized as follows:

- Removal of all golf course related buildings and infrastructure (i.e., water/sand traps, greens and tee boxes).
- Land clearing, including tree removals on the backlands portion of the site, necessary to undertake the agricultural works and active farming on the backlands.
- Land levelling and grading to support on-site agricultural drainage infrastructure.
- The agricultural improvement works involves salvaging and utilizing native soils from the subject site, including those soils from the front school portion, to be re-purposed and applied on the agricultural backlands. Testing of on-site native soils has been undertaken by the agrologist to confirm no contamination.
- On-site drainage infrastructure that would be designed in coordination with the agrologist's grading plan for the backlands to enable water to be discharged to the King Road drainage canal.
- Provision of farm irrigation infrastructure to service the backlands.
- To address soil compaction and improve drainage conditions, apply various techniques (ploughing and disking) in accordance with the agrologist recommendations.

- A cost estimate for the comprehensive scope of agricultural improvement works identified by the argologist is approximately $702,440. Subject to the outcome of the ALR non-farm use application consideration by Council and the ALC, this amount would be secured through the rezoning application by the applicant to cover agricultural improvement works recommended by the agrologist are implemented to the City's and ALC's satisfaction. Any revisions to these works and resulting impacts to the bonding amount that occur through either the processing of the ALR non-farm use application and subsequent rezoning would be identified and addressed through the rezoning application.

Farm Access Provisions

Proposed farm access from No. 5 Road to the backlands will be provided via a farm access road along the south edge of the subject site. Land modifications for the construction of this farm road will be kept to a minimum to enable a durable, permeable surface capable of supporting farm vehicles only with minimal impacts to the agricultural land.

Proposed farm access is provided along the length of the backlands (north-south running) and is proposed to be aligned along the east portion of the subject site adjacent to Highway 99. Land modifications for the construction of this farm road will be minimal and similar to the proposed west-east running farm road access to No. 5 Road. This provision to secure farm access across the backlands is consistent with the OCP No. 5 Road Backlands Policy to ensure farm vehicle access (north-south) across all backlands within this area without having to use No. 5 Road.

Construction of these farm access roads (west-east; north-south) would be completed through the agricultural improvements works referenced previously with all costs for these works to be paid by the owner and included in the bond secured at rezoning if Council and the ALC approve the ALR non-farm use and subsequent rezoning applications. A legal agreement (statutory right-of-way or other mechanism) would also be secured through the rezoning application for these farm access roads to enable farm operators to have access to these farm roads to support agricultural activities.

Farm Plan Implementation

The owner proposes to lease the backlands to an organic farmer who will establish an organic farm over the subject site's backlands. The agricultural improvements works described above would be completed before implementation of the farm plan by the agricultural operator proposed to lease the land. The applicant has engaged a local organic producer and entered into a memorandum of understanding (Attachment 7) with the property owner to farm the backlands area. The proposed farmer is Cherry Lane Farms, who currently have a farm in Richmond on Beckwith Road.

To ensure that this farm plan is implemented, a separate security is proposed as a requirement that would be in addition to the bond submitted to the City for the agricultural improvement works. The preliminary estimate for this bond is approximately $264,000 and is based on the agrologist's estimate of anticipated farm capital start-up costs and operation/production costs over a one year period. This bond amount is subject to revision based on review by Council and the ALC through the review of this ALR non-farm use application and future rezoning application. The bond would be secured through the rezoning application process.

Agricultural Buffer Area

The proposal includes a landscaped buffer area (5 m wide) to be provided on the school site (within the westerly 110 m of the site) to provide a suitable transition area and functional screen to the agricultural activities proposed for the backlands. This landscaped buffer to farm activities would be secured through the rezoning application with the detailed design to be provided at this time.

Transportation Review

A Traffic Impact Assessment (TIA) was submitted by a traffic consultant for this proposal for review by Transportation staff who generally concurs with the proposed access arrangement for the school and recommendations in the TIA. Through this review, road dedications along the subject site's No. 5 Road frontage were identified based on anticipated infrastructure improvements required by the City. These infrastructure improvements generally involve works to establish a new boulevard, multi-use public path/sidewalk and two-way left turn lane along No. 5 Road. The approximate width of road dedication along No. 5 Road is approximately 5.3 m to 5.7 m wide. As noted earlier, the length and area of land that can be considered for community institutional/school uses on the subject site in this proposal is measured from the No. 5 Road property line after dedication of land (Attachment 2).

The proposal includes two-full movement driveway accesses along No. 5 Road for the school and one additional driveway to access the farm road at the south of the site. The submitted TIA and transportation staff reviewed the proposed vehicle access along No. 5 Road with no concerns noted. On-site parking for the school complies with Zoning Bylaw requirements for off-street parking. The site plan also provides for on-site drop-off and pick areas to service the school to ensure no drop-off/pick-up activities occur on No. 5 Road. Additional transportation review of this development proposal, including confirmation of road dedication requirements would occur through the rezoning application and subject to the outcome of the ALR non-farm use application.

Williams Road (between No. 5 Road and Highway 99)

Through the review of the subject site undertaken in the previous submitted ALR non-farm use application, it was determined that a historical error was made that resulted in Williams Road (between No. 5 Road and Highway 99) not being dedicated as road. As a result, this southern 10 m (33 ft.) wide portion of land (previously thought to be dedicated road) is included in the overall area of the subject site. In consultation with City staff and the applicant, the dedication of the north portion of the Williams Road allowance is not required for the following reasons:

- The City has no transportation or infrastructure needs for this portion of the road allowance between No. 5 Road and Highway 99.
- Approval from the ALC is generally required for any dedication of roads in the ALR. The ALC may have a number of concerns around dedication of land in the ALR for the purposes of road, which may be viewed as having a potential negative impact to farming.
- A farm access road generally along the south portion of the subject site is being secured through this project to allow access to the agricultural area proposed for the subject site

and backland areas for other properties within this area in accordance with the No. 5 Road Backlands Policy.

Engineering Review

Engineering staff reviewed the proposed ALR non-farm use application with no servicing issues identified. Should this proposal advance, additional review by Engineering staff would be undertaken through the subsequent rezoning application to confirm the servicing requirements, including any applicable infrastructure upgrades and works related to this project. These works would be secured through a Servicing Agreement.

Forthcoming Rezoning Application Process

Pending the outcome of the ALR non-farm use application for the subject site, a subsequent rezoning application will be required to rezone the site from "Golf Course (GC)" zoning to a zoning district that would allow the school activity and any related uses on the front portion of the site. The backlands portion of the site would also be rezoned to only allow agricultural uses and no longer permit a golf course on the site. The future rezoning application would also review the overall form and character of the proposed school buildings and all landscaping proposed for the development. This rezoning application would also follow-up on the applicable items identified in this ALR non-farm use application report that would be addressed through the subsequent rezoning application process.

Conclusion

The purpose of this ALR non-farm use application is to develop a school with accessory supporting uses on the westerly 110 m of 9500 No. 5 Road in coordination with agricultural improvement works to convert the remaining backlands portion of the site from a golf course to farmland in order to lease this area to a local farmer.

This proposal is consistent with the OCP No. 5 Road Backlands Policy to consider community institutional uses on the westerly 110 m of the subject site in conjunction with a farm plan for the remaining backlands area. The application proposes a comprehensive package of agricultural improvement works in conjunction with plans to lease the backlands area to an organic producer to implement the farm plan. On this basis, staff recommend support of this ALR non-farm use application.

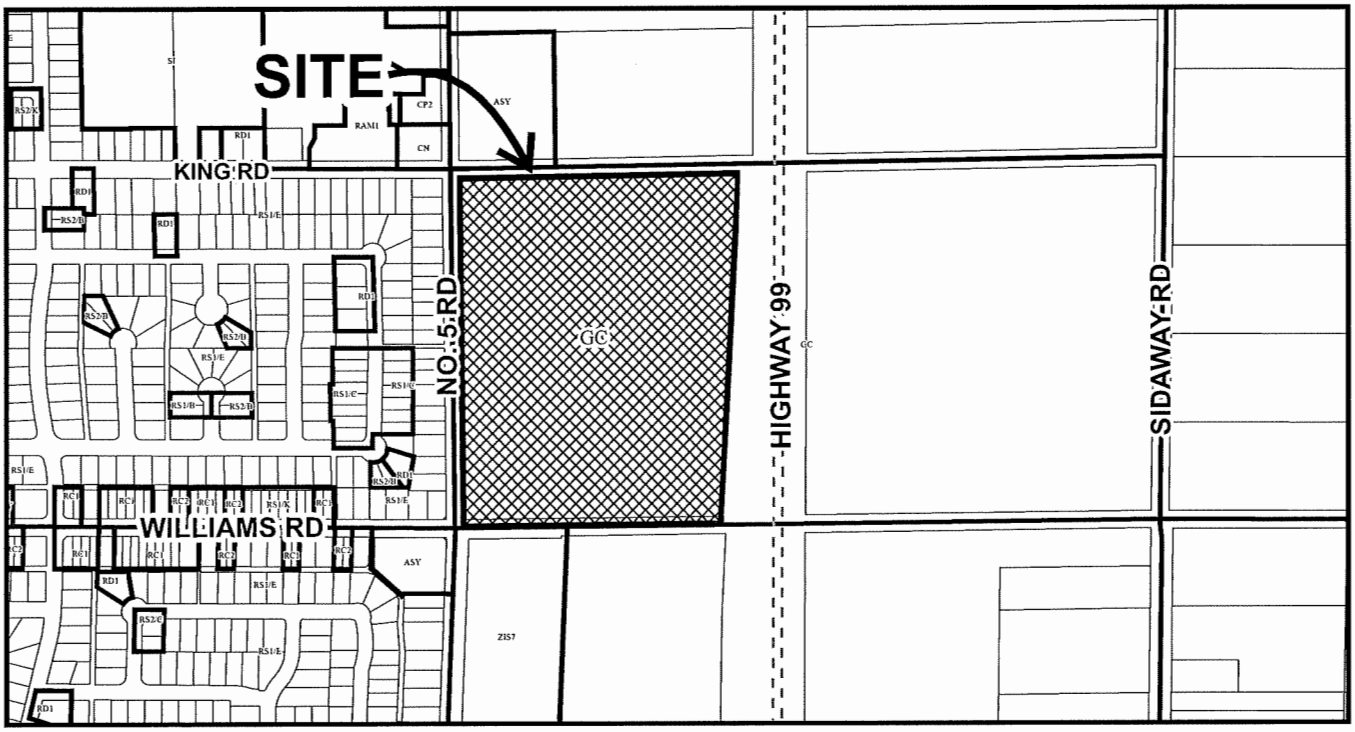
Kevin Eng
Planner 2

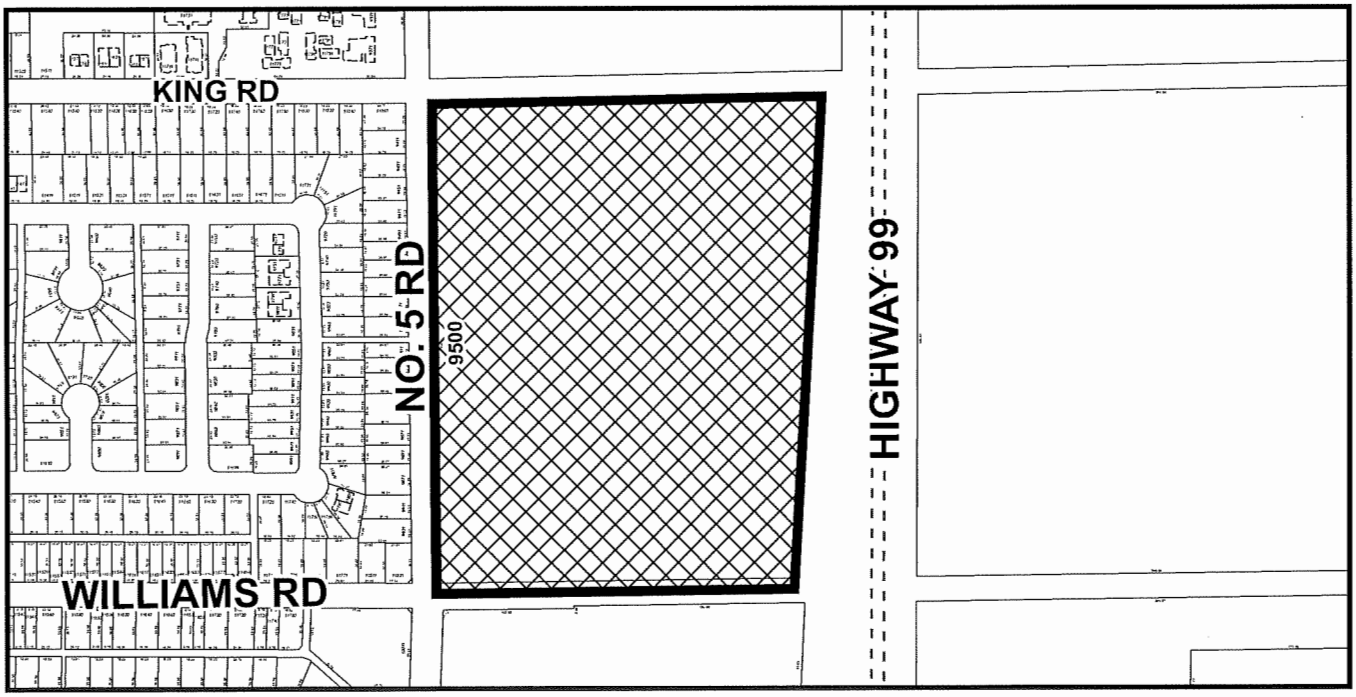
KE:cas

Attachment 1: Subject Site Location Map
Attachment 2: Proposed ALR-Non Farm Use Area
Attachment 3: Conceptual Development Plans

Attachment 4: OCP No. 5 Road Backlands Policy
Attachment 5: Excerpt of FSAAC Minutes (September 12, 2019)
Attachment 6: Agrologist Report
Attachment 7: Memorandum of Understanding (owner and farmer/Cherry Lane Farms)

City of Richmond





AG 18-842960

Original Date: 01/09/19

Revision Date: 11/05/19

Note: Dimensions are in METRES

City of
Richmond

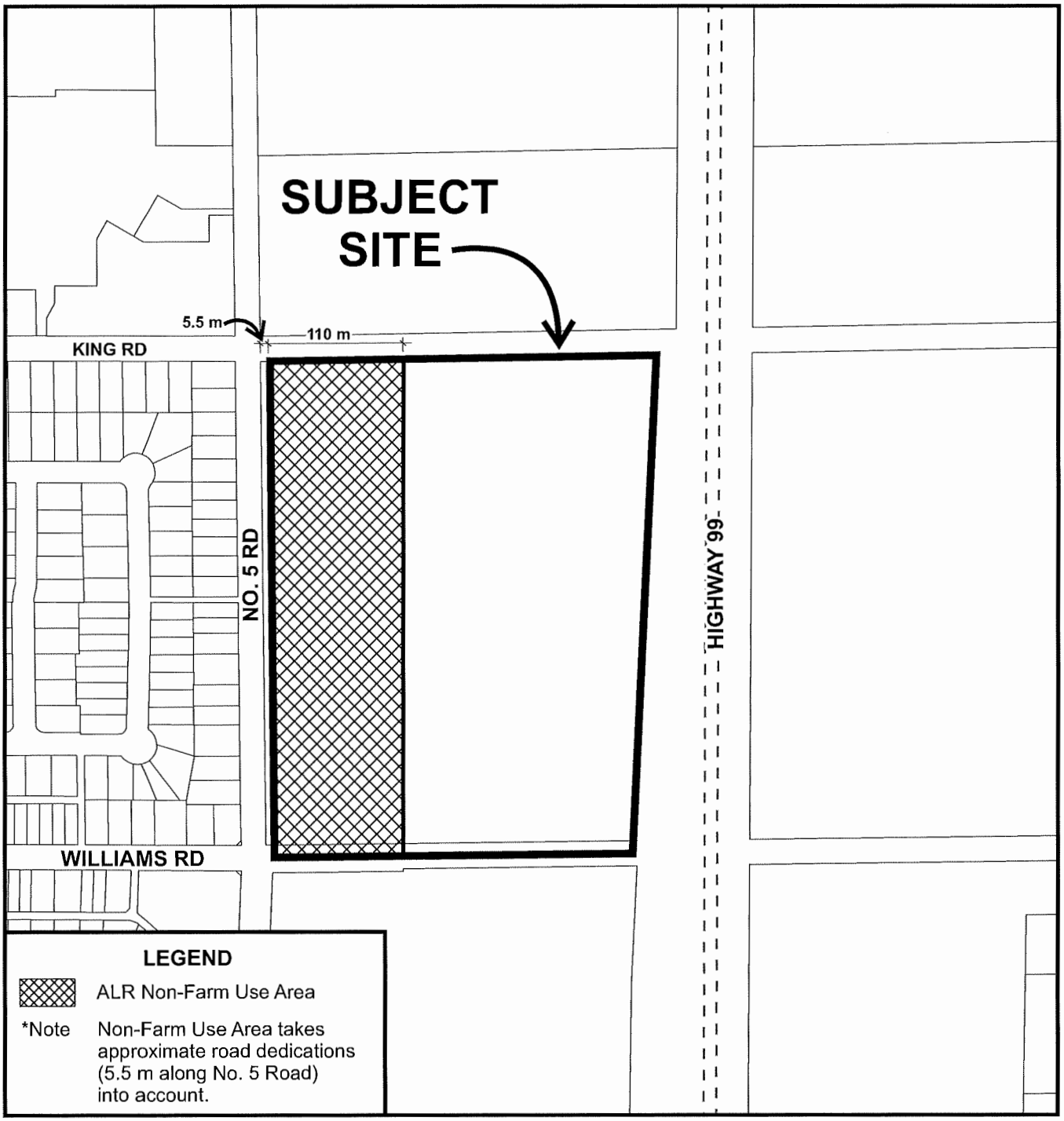
AG 18-842960

Original Date: 01/09/19

Revision Date: 11/05/19

Note: Dimensions are in METRES

City of Richmond



Proposed Non-Farm Use Area for 9500 No. 5 Road (AG 18-842960)

Original Date: 11/04/19

Revision Date: 11/05/19

Note: Dimensions are in METRES

240 - 389 West 6th Ave.
Vancouver, B.C. V5Y 0G2
Tel: 604 - 731 - 2966
Fax: 604 - 734 - 1121
studioone@studioone.ca

studioone architecture inc.

no.:	date:	revisions:
4.	October 24, 19	Conceptual Design Pricing
3.	August 23, 19	Revised plan
2.	August 15, 19	Revised site plan
1.	NOVEMBER 15, 18	Issued for Non-Farm Use

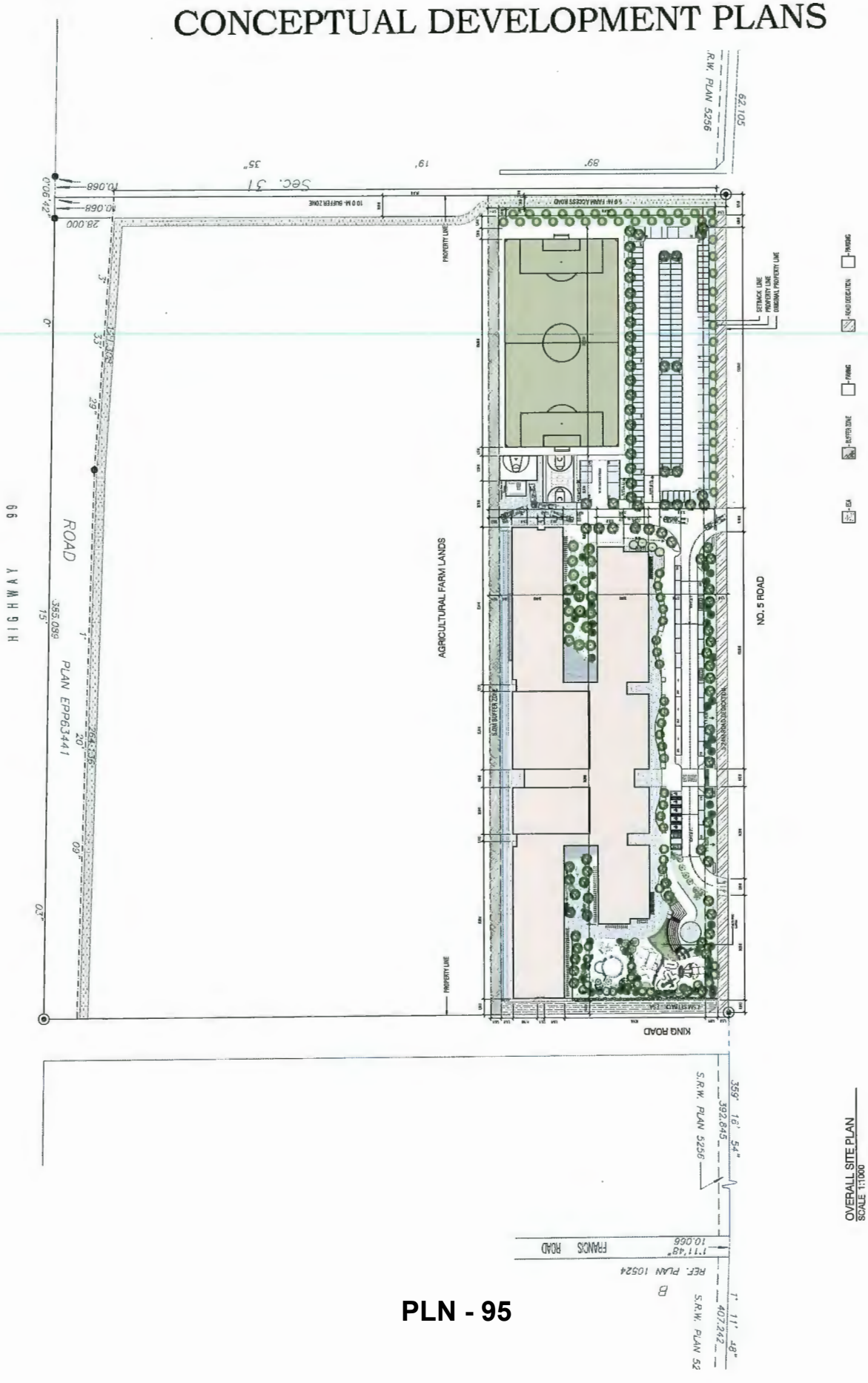
project title: PA2022
9500 NO.5 RD
RICHMOND
BRITISH COLUMBIA

drawing title: OVERALL SITE PLAN

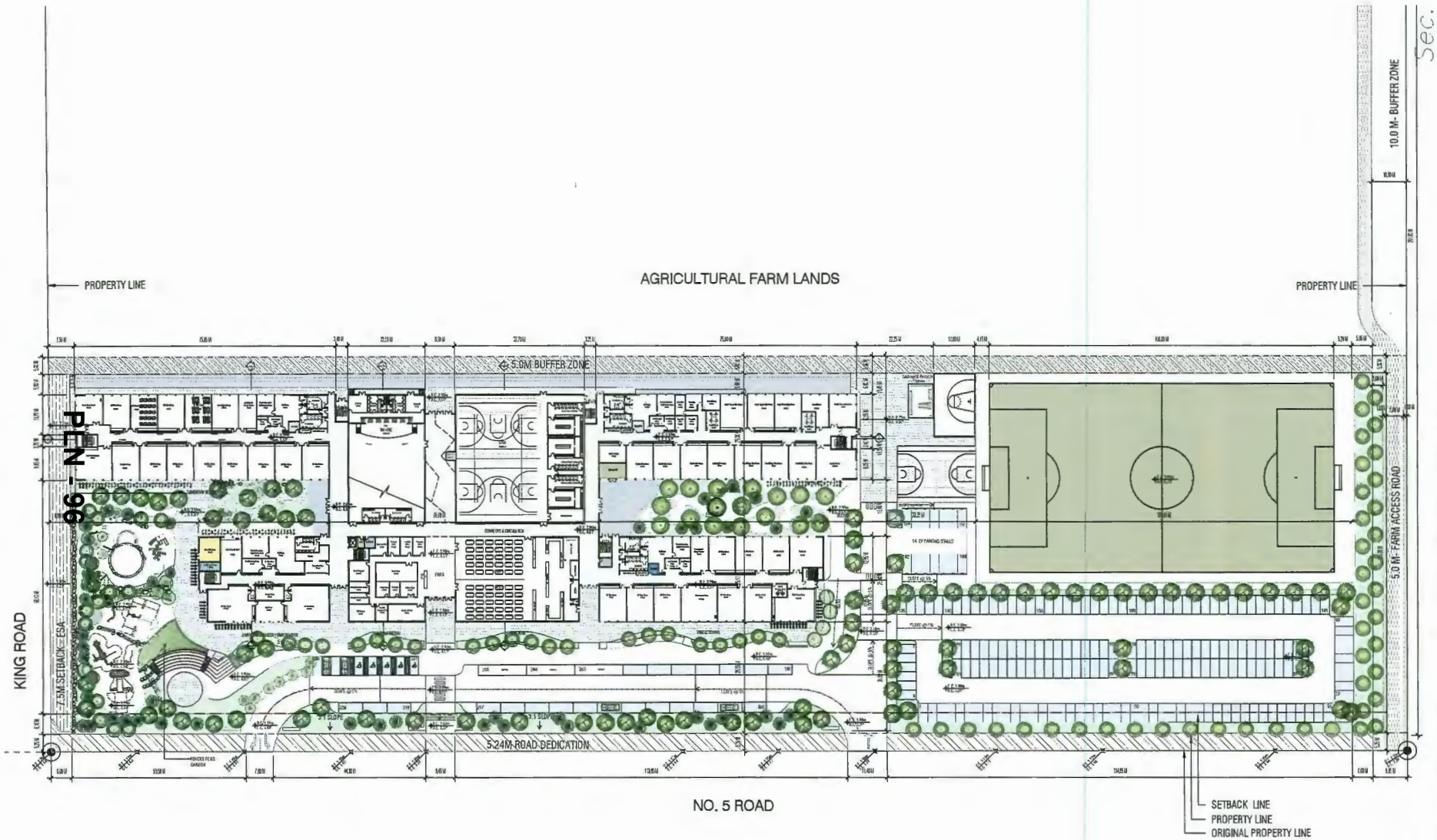
project no.:	17021
drawn by:	RM
checked by:	
date:	AUG.15, 2019
scale:	1:1000

drawing no.: A1.0

CONCEPTUAL DEVELOPMENT PLANS



OVERALL SITE PLAN
SCALE 1:1000



SITE PLAN
SCALE 1:500

ESA | BUFFER ZONE | LANDSCAPING | PAVING | FARM ACCESS ROAD | ROAD DEDICATION | PAVING

240 - 388 West 8th Ave,
Vancouver, B.C. V5Y 3X2
Tel: 604 - 731 - 3966
Fax: 604 - 734 - 1121
studioonearchitecture.ca

studioone architecture inc.

no.:	date:	description:
4	Oct. 30, 2019	Revised Site Plan
3	Sept. 23, 2019	Revised ESA Setback
2	Aug. 15, 2019	Revised Site Plan
1	Nov. 16, 2018	Issued for Use Permit

revisions

project title:
PYTHAGORAS
ACADEMY 2022
9500 No5 Rd
RICHMOND, BC

drawing title:
SITE PLAN

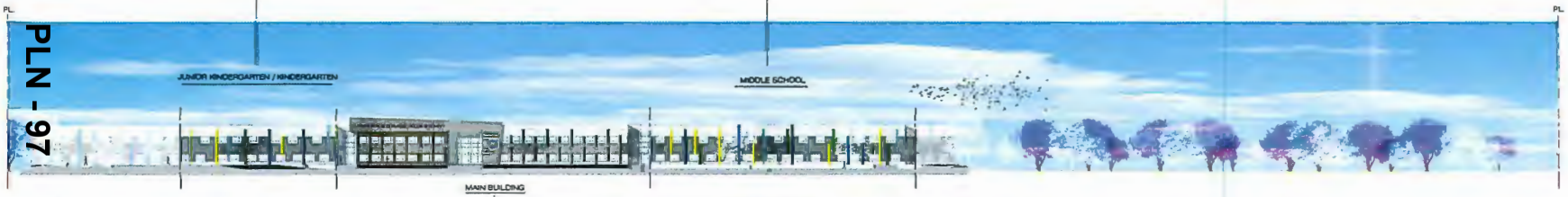
project no.:	17021
drawn by:	RM
checked by:	JW
date:	Oct. 30, 2019
scale:	1:500

drawing no.:
A1.1

PARTIAL WEST ELEVATION JUNIOR KINDERGARTEN/ KINDERGARTEN
SCALE: 1 : 200

PARTIAL WEST ELEVATION MIDDLE SCHOOL
SCALE: 1 : 200

PLN - 97



WEST ELEVATION NO. 5 ROAD
SCALE: 1 : 500

PARTIAL WEST ELEVATION MAIN BUILDING
SCALE: 1 : 200

FINISH SCHEDULE	
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2	PREFINISHED METAL CLADDING/COLOR SAGE GREEN WXL56089
3	PREFINISHED METAL CLADDING/COLOR NAVY BLUE WXL56084
4	PREFINISHED METAL CLADDING/COLOR SAPHIR BLUE WXL56163
5	PREFINISHED METAL CLADDING/MORIN MATRIX MX3.0 WHITE WXL56086
6	PREFINISHED METAL CLADDING/COLOR CARBONE ME9740
7	DOUBLE GLAZED ALUMINUM WINDOWS
8	CLEAR GLASS
9	COMPOSITE CONCRETE PANEL
10	PREFINISHED METAL CLADDING/WESTAD300R STEEL PANEL DARK CEDAR PAINTED FINISH

240 - 388 West 8th Ave.
Vancouver, B.C. V5Y 3X2
Tel: 604 - 731 - 3966
Fax: 604 - 734 - 1121
studioarchitecture.ca

studio one architecture inc.

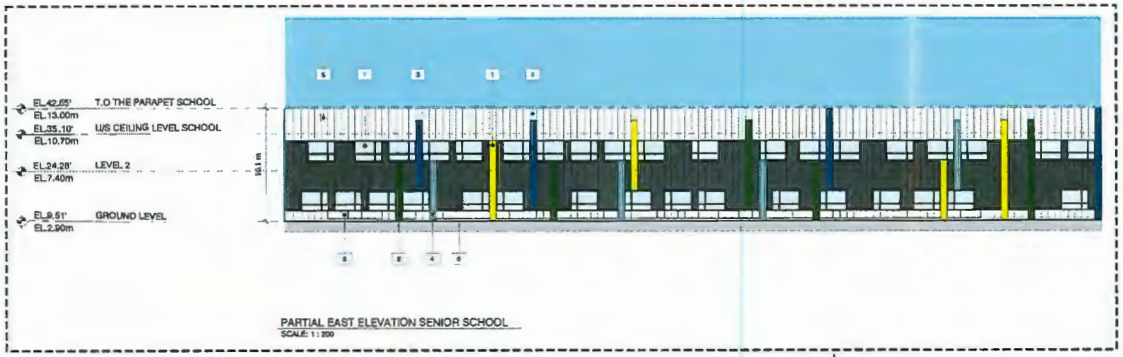
2. August 15, 19 Revised site plan
1. NOVEMBER 16, 18 Issued for Non Farm Use
no.: date: description:
Revisions

project title:
PYTHAGORAS ACADEMY 2022
9500 No 5 Rd
RICHMOND, BC

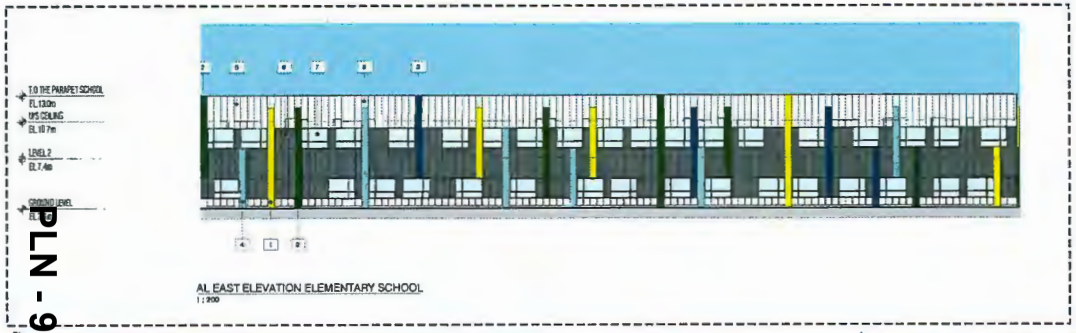
drawing title:
WEST ELEVATIONS

project no.:	17021
drawn by:	GH
checked by:	JM/RM
date:	AUG 15, 2019
scale:	1 : 200

drawing no.:
A2.1

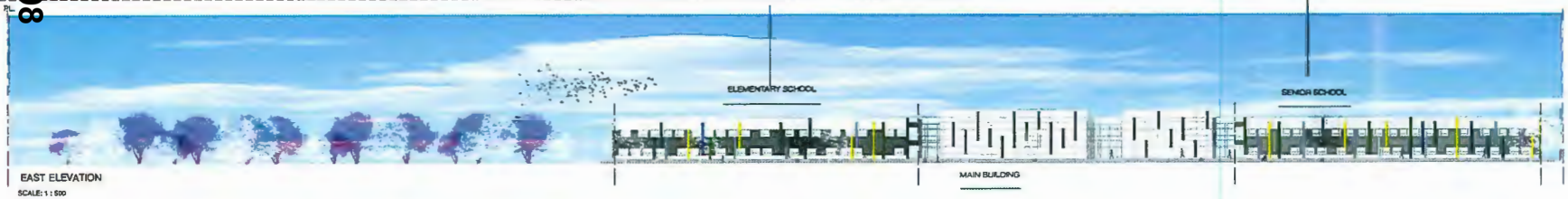


PARTIAL EAST ELEVATION SENIOR SCHOOL
SCALE: 1 : 200

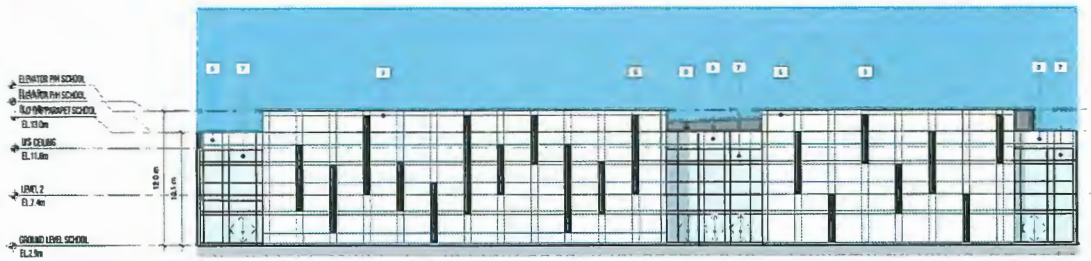


AL EAST ELEVATION ELEMENTARY SCHOOL
1 : 200

PLN - 98



EAST ELEVATION
SCALE: 1 : 500



PARTIAL EAST ELEVATION MAIN BUILDING
SCALE: 1 : 200

FINISH SCHEDULE	
1	PREFINISHED METAL CLADDING/COLOR GOLD WXL56670
2	PREFINISHED METAL CLADDING/COLOR SAGE GREEN WXL56089
3	PREFINISHED METAL CLADDING/COLOR NAVY BLUE WXL56084
4	PREFINISHED METAL CLADDING/COLOR SAPHIR BLUE WXL56163
5	PREFINISHED METAL CLADDING/NORIN MATRIX M33 0 WHITE WXL56086
6	PREFINISHED METAL CLADDING/COLOR CARBONE MES140
7	DOUBLE GLAZED ALUMINUM WINDOWS
8	CLEAR GLASS
9	COMPOSITE CONCRETE PANEL
10	PREFINISHED METAL CLADDING/WICWEST AD300R STEEL PANEL DARK CEDAR PAINTED FINISH

2401 - 398 West 8th Ave.
Vancouver, B.C. V5Y 3X2
Tel: 604 - 731 - 3565
Fax: 604 - 734 - 1121
studioonearchitecture.ca

studioone architecture inc.

2. August 15, 19 Revised site plan
1. NOVEMBER 16, 18 Issued for Non Farm Use

no.:	date:	description:

Revisions

project title:
PYTHAGORAS ACADEMY 2022
9500 No 5 Rd
RICHMOND, BC

drawing title:
EAST ELEVATIONS

project no.:	17021
drawn by:	GH
checked by:	RM
date:	AUG 15, 2019
scale:	1 : 200

drawing no.:
A2.2

PLN - 99

NORTH ELEVATION
SCALE: 1 : 200

SOUTH ELEVATION
SCALE: 1 : 200

FINISH SCHEDULE	
1	PREFINISHED METAL CLADDING/COLOR GOLD WXL5407G
2	PREFINISHED METAL CLADDING/COLOR CAST GREEN WXL5608G
3	PREFINISHED METAL CLADDING/COLOR NAVY BLUE WXL5808A
4	PREFINISHED METAL CLADDING/COLOR SAPHIR BLUE W0156163
5	PREFINISHED METAL CLADDING/MORIN MATRIX MC3.0 WHITE WXL5E086
6	PREFINISHED METAL CLADDING/COLOR CARBONE ME9740
7	DOUBLE GLAZED ALUMINUM WINDOWS
8	CLEAR GLASS
9	COMPOSITE CONCRETE PANEL
10	PREFINISHED METAL CLADDING/VICWEST AD300R STEEL PANEL DARK CEDAR PAINTED FINISH

240 - 388 West 8th Ave
Vancouver, B.C. V5Y 3X2
Tel: 604 - 731 - 3966
Fax: 604 - 734 - 1121
studioonearchitecture.ca

studioone architecture inc.

2. August 15, 19 Revised site plan
1. NOVEMBER 16, 18 Issued for Non Farm Use
no.: date: description:
Revisions

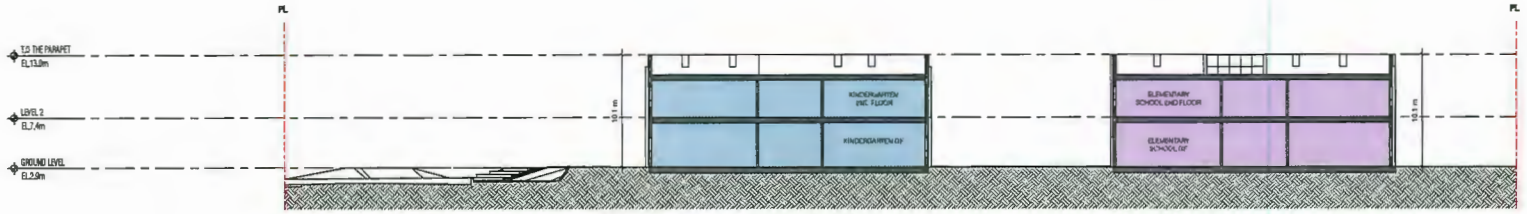
project title:
PYTHAGORAS
ACADEMY 2022
9500 No 5 Rd
RICHMOND, BC

drawing title:
NORTH & SOUTH
ELEVATIONS

project no.:	17021
drawn by:	GH
checked by:	RM
date:	AUG 15 2018
scale:	1 : 200

drawing no.:
A2.3

PLN - 100



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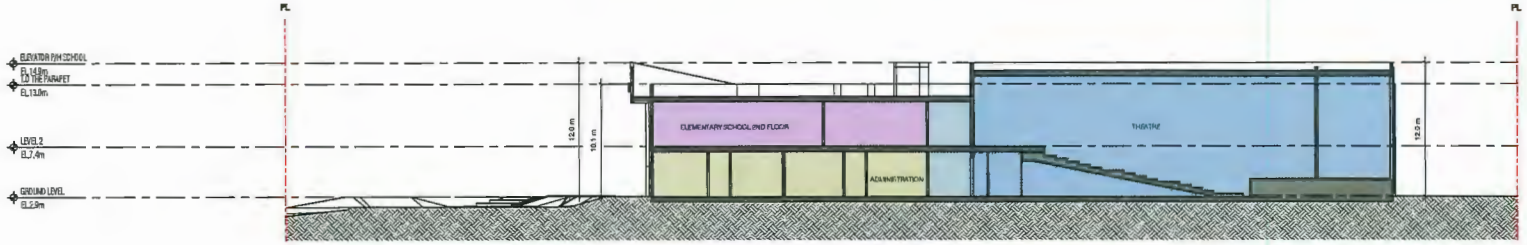

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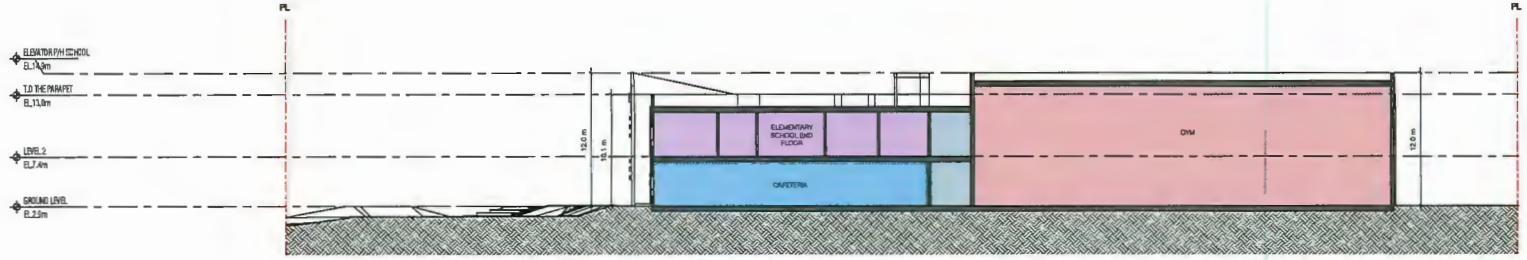


SECTION C-C
SCALE: 1 : 200

SECTION D-D
SCALE: 1 : 500

- CORRIDOR
- SERVICES & EXIT
- CAFETERI
- GY
- SENIOR SCHOO
- ADMINISTRATIO
- MIDDLE SCHOO
- ELEMENTARY SCHOO

240 - 388 West 8th Ave
Vancouver B.C. V5Y 3X2
Tel: 604 - 731 - 3966
Fax: 604 - 734 - 1121
studioone@architecture.ca
studio one architecture inc.

no.:	date:	description:
Revisions		
2.	August 15, 19	Revised site plan
1.	NOVEMBER 16, 18	Issued for Non Farm Use

project title:
PYTHAGORAS
ACADEMY 2022
9500 No 5 Rd
RICHMOND, BC

drawing title:
SECTIONS

project no.:	17021
drawn by:	RM
checked by:	JM
date:	AUG. 15, 2019
scale:	As Indicated

drawing no.:
A3.1

PLN - 101

240 - 388 West 8th Ave,
Vancouver, B.C. V5Y 3X2
Tel: 604 - 731 - 3966
Fax: 604 - 734 - 1121
studioonearchitecture.ca

studioone architecture inc.

2. August 15, 19 Revised site plan
1. NOVEMBER 16, 18 Issued for Non Form Use
no.: date: description:
revisions

project title:
PYTHAGORAS
ACADEMY 2022
9500 No5 Rd
RICHMOND, BC

drawing title:
3D VIEWS
VIE

project no.: 17021
drawn by: RM
checked by:
date: AUG. 15, 2019
scale: N.T.S

drawing no.:
A4.0

OBJECTIVE 5:

Find ways to recover food waste.

POLICIES:

a) support the efforts of community groups and the private sector to establish initiatives that divert recoverable food from the pre-waste stream for redistribution to local food banks;

b) develop strategies to encourage organic waste diversion from multi-family housing and commercial properties;

c) support the recycling and re-use of organic waste;

d) develop an educational program to promote awareness around food production, health, and impacts on the community.

Credit: Richmond Food Security Society

Bylaw 9506 2016/02/15

7.3 No. 5 Road Backlands Policy

OVERVIEW:

Since 1990, the City and the Agricultural Land Commission (ALC) have agreed that, within the Agricultural Land Reserve (ALR), there shall be a unique area called "No. 5 Road Backlands Policy Area" as shown on the attached No. 5 Road Backlands Policy Area Map.

The purpose of the Policy is to allow Community Institutional uses on the westerly 110m ("Frontlands") of the properties located on the east side of No. 5 Road between Blundell Road and Steveston Highway (the area outlined in bold lines on the No. 5 Road Backlands Policy Area Map), if the remaining portions ("Backlands") are actively farmed.

Bylaw 9506
2016/02/15

OBJECTIVE:

Community Institutional uses may be permitted in the Frontlands if the Backlands are actively farmed.

POLICIES:

a) the types of uses which may be considered in the Frontlands are those consistent with the Community Institutional land use definition contained in the 2041 Official Community Plan (the "OCP") to be considered and approved by the City and the Agricultural Land Commission through the necessary land use approval process;

b) in the Frontlands, clearly ancillary uses (e.g., dormitory) to the principal Community Institutional uses are allowed, but principal residential uses (e.g., congregate housing, community care facility, multi-family housing) are not allowed;

c) property owners who do not intend to farm the Backlands themselves are encouraged to, either lease them to a farmer, dedicate their Backlands to the City or enter into legal agreements with the City to allow the City or the City's designate to access and farm the Backlands;

d) the City will continue to strive for a partnership approach with property owners to achieve farming of the Backlands (e.g., based on the approved farm plans);

e) in the Backlands, a limited infrastructure component (e.g., little or no regional and on-site drainage, irrigation or farm access roads) could be allowed, where a full infrastructure component is not practical;

f) in the Frontlands, satisfactory sanitary sewage disposal is required as a condition of non-farm use or rezoning approval;

g) applicants shall submit the necessary reports to the City to achieve farming with all costs to implement works associated with an approved farm plan to be paid by the applicant;

Development Application Procedure and Requirements

a) all proposals for Community Institutional development are subject to City and ALC approval through the necessary development application process to be reviewed on a case-by-case basis and in accordance with the OCP;

b) consideration of Community Institutional development in the Frontlands is generally subject to:

   i) submission and approval of an ALR Non-Farm Use application that is required to be endorsed by the City prior to being considered by the ALC. If the City endorses the ALR Non-Farm Use application, it will be forwarded to the ALC for consideration;

   ii) pending the outcome of the ALR Non-Farm Use application, a rezoning application will also be required and subject to the required statutory process;

   iii) other Development Applications (i.e., Environmentally Sensitive Area Development Permit, Development Variance Permit) may also be required based on the proposal or site context;

Bylaw 9506 2016/02/15

c) in certain cases, a rezoning application will not be required following approval of an ALR Non-Farm Use application. Under these circumstances, any specific requirements to be secured through the ALR non-farm use application are to be confirmed through the necessary resolution of Council upon consideration of the application;

d) in considering development proposals (i.e., ALR Non-Farm Use applications or rezoning application) in the No. 5 Road Backlands Policy area, the City requires the applicants to:

i) prepare farm plans with access;

ii) explore farm consolidation;

iii) commit to do any necessary on-site infrastructure improvements;

iv) co-operate as necessary to remove constraints (e.g., required infrastructure) to farming the Backlands, in partnership with others;

v) commit to legal requirements as may be stipulated by Council to achieve acceptable land uses (e.g., farming the Backlands);

vi) provide financial security to ensure the approved farm plan is implemented;

vii) undertake active farming of the Backlands;

viii) register a statutory right-of-way on title for a future farm access road along the eastern edge of the property along the Backlands, to the satisfaction of the Director of Development;

ix) comply with such other considerations or requirements by Council;

Reporting Requirements

a) all property owners who are required to farm the Backlands must, in a form acceptable to the City, report to the City on a yearly basis regarding the current status of the farm by providing clear evidence (e.g., detailed description of the farming activities conducted in the Backlands, photos, farm tax records) that the Backlands are actively being farmed in accordance with the approved farm plans, to Council and the ALC's satisfaction;

Amendments to the Above Policies

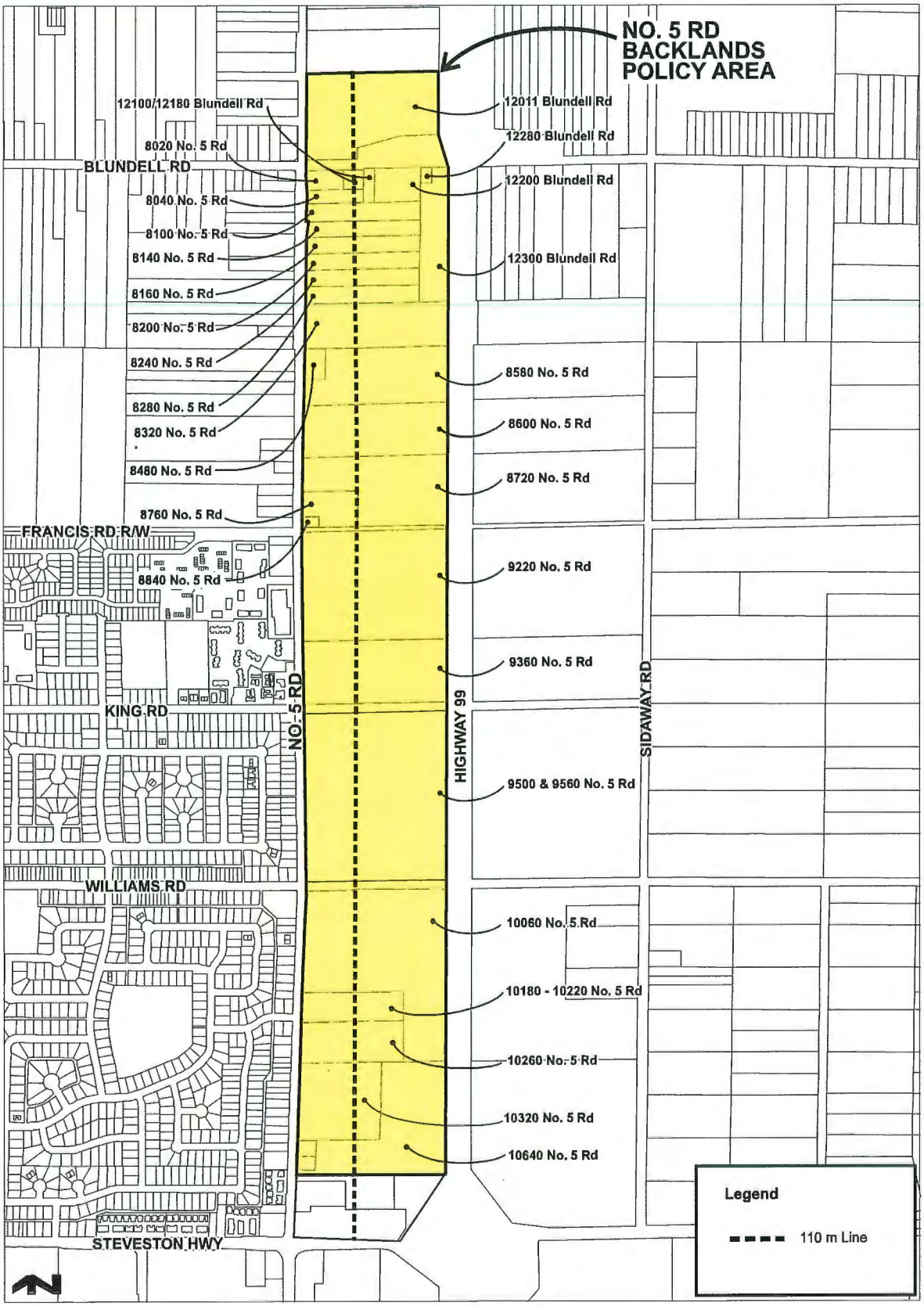
a) amendments to these policies in the 2041 OCP is subject to the required statutory process, which will include consultation between the City, ALC and other stakeholders as deemed necessary;

Co-ordination of Review Process

a) the City and the ALC will co-ordinate efforts when reviewing applications for ALR non-farm use and subsequent rezoning applications, in order to ensure that the interests of each party are addressed. This co-ordinated effort will be done prior to granting any approvals.

No. 5 Road Backlands Policy Area Map

Bylaw 9506
2016/02/15



Excerpt of Food Security and Agricultural Advisory Committee
Meeting Minutes
September 12, 2019

Non-Farm Use Application at 9500 No. 5 Road

Kevin Eng, Planner 2, introduced the proposed non-farm use application at 9500 No. 5 Road and provided the following comments:

- The site is located in the Agricultural Land Reserve (ALR), was previously used as a golf course, and has a total area of approximately 29 acres;
- The property is located within the OCP No. 5 Road Backlands Policy area and the proposal is consistent with the Policy;
- The property has a Community Institutional land use designation along with westerly 110 m, with the remaining portion of the property designated Agriculture;
- Background information was provided on a previous non-farm use application that included subdivision of the land by a previous owner, which was ultimately denied by the ALC. Staff noted that the current proposal is under a new owner and completely separate from any previous applications on the subject site;
- A school is proposed to be developed on the westerly 110 m, including supporting uses;
- The applicant has submitted an agricultural remediation plan for the backlands to convert the area of approximately 18.4 acres to agriculture; and
- A security in the amount of approximately $800,000 will be secured to ensure the remediation of the backlands to agriculture.

Bruce McTavish, Project Agrologist, provided the following additional comments regarding the proposal:

- The proposal will include a significant buffer between the proposed school and farmland in accordance with the ALC's guidelines;
- Site investigations revealed that there is no contaminated soil on the site, small pockets of asphalt debris will be removed, and the soil series is Delta ranging from sandy clay to silt clay and silt loam;
- Soil chemistry is normal for an unused site;
- Present agricultural capability is Class 4W and the proposal is to improve the entire backlands portion area to Class 2WD;
- Agricultural remediation will include tree and stump removal, grass and weed removal, berm removal, filling of water hazard (with berm material), removal of sand traps, removal of existing irrigation and drain lines, cultivation and soil de-compaction techniques;
- Salvaged topsoil from the proposed school site will be moved to the backlands;

- Subsurface drainage will be installed, the land will be prepared for planting, and grass forage crop will be planted to improve soil; and
- Preferred farm operator would be organic vegetable or organic small fruit production. The consulting agrologist noted that they have had discussions with commercial farmers to lease the backlands portion of their site.

In response to questions from the Committee, Staff noted that should the non-farm use application be approved by Council and the ALC, a rezoning application would be required to allow the proposed land uses.

Councillor Steves indicated support for the City to retain ownership of the backlands.

As a result of the discussion, the Committee providing the following comments:

- Consider retaining a portion of the proposed school site for agricultural programing for students; and
- Consider providing space within the proposed school site for non-profit organizations.

As a result of the discussion, the Committee passed the following motion:

That the Food Security and Agricultural Advisory Committee support the Non-Farm Use Application at 9500 No. 5 Road as presented.

Carried Unanimously

McTAVISH
RESOURCE & MANAGEMENT
CONSULTANTS LTD.

Agricultural Conversion Plan
Pythagoras Academy – 9500 No. 5 Rd, Richmond BC

Prepared for: Dagneault Planning Consultants Ltd.

November 4, 2019

Revision Index			
Revision #	Approved by	Date (YYYY-MM-DD)	Issued Status
1	B. McTavish	2019-06-17	Issued for internal review
2	B. McTavish	2019-06-28	Final for distribution to client
3	B. McTavish	2019-07-02	Final for distribution to CoR
4	B. McTavish	2019-09-05	Final with revisions
5	B. McTavish	2019-10-26	Final with revisions from FSAAC Meeting
6	B. McTavish	2019-11-04	Final with revisions from comments from CoR

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Executive Summary

The following report submitted by McTavish Resource & Management Consultants Ltd. (McTavish) is an update that summarizes the eight reports submitted to the City of Richmond (CoR) with respect to converting the eastern ~18 acres of the Mylora Golf Course located at 9500 No. 5 Road, Richmond BC, to a commercial farm. The current report also provides new information on subsurface drainage and updates the soil contaminated site (CSR) data to reflect updates to the regulations.

The McTavish report is prepared as part of the required supporting documentation for the proposed conversion of the western 10 acres to an independent school. The No. 5 Road corridor has seen a number of agricultural properties converted to institutional use with the eastern portion's sections in Agricultural production. The property directly south of the Mylora Golf course is the Ling Yen Mountain Temple which is undergoing a significant expansion including removal or agricultural land but with significant improvement of the remaining land. South of the temple is the Richmond Christian School which was also developed on agricultural land.

One of the major issues with the institutional development along No. 5 Road is the lack of agricultural improvements and production on the remaining agricultural land. The proposed strategy presented in this document requires an investment of approximately $700,000 in improving the agricultural capability of the property. To the author's best knowledge, this will be the first time in British Columbia that a golf course has been converted back to productive agricultural land. The property owners have also secured a long-term lease of the agricultural portion of the land to a Lower Mainland farmer with many years of experience in farming land in Richmond and Delta.

The present land capability for agriculture on the site is 4WD. This will be improved 2WD by following the recommendations for soil improvement in this report. The improvements will include removing all golf course features, improving surface drainage by crowning, spreading of salvaged topsoil, subsoiling, cultivation and incorporation of organic matter. Drainage will also be improved by the installation of a subsurface drainage system.

Since the soils are compacted from years of golf course use, they will be remediated by using typical cultivation methods such as subsoiling, ploughing and disking. These actions will remove the existing root restriction layer and allow rooting to approximately 50 cm depth compared to the present 20 cm depth. These actions will allow a wide variety of annual and perennial crops to be grown on the property.

Soil pits were installed on all fairways and greens, soil samples collected and analyzed for agricultural chemical criteria as well as for heavy metals because golf courses have historically used fungicides that incorporate mercury and cadmium. The soil analysis indicated that metals were well below the limits for agricultural soils, and that there are no soil chemical issues that would preclude farming on this site or necessitate any soil removal.

Extensive excavations for soil sampling took place on all constructed berms to determine if there was debris in the berms that is not compatible with agriculture. Only a small amount of concrete and asphalt was found in a single location. The amount found is not significant with respect to using the berm material for filling in the water hazards on the property.

A 2-inch water line will be connected to the CoR water system and run to the property to provide a source of irrigation water. An all-weather farm road will be constructed to provide access to the farm.

A number of agricultural options were presented to the City of Richmond Agriculture Advisory Committee (AAC) and to City staff under a previous development application. The City of Richmond AAC requested that the site be converted into a single contiguous farm and that all golf infrastructure be removed including all berms and trees that would interfere with farm operations. Based on this recommendation an agricultural reclamation/conversion plan has been developed and is described in this report. This report also includes recommendations from the Food Security and Agricultural Advisor Committee (FSAAC) September 2019 meeting that reviewed the McTavish agricultural plan.

Although this is a new application, the previous soil investigations and farm conversion plan that was accepted by the City of Richmond AAC and the CoR is re-submitted with some modifications. The proposed farm conversion process includes improvement of the drainage by the installation of subsurface drains and the confirmation of a lease by a long-term Richmond farmer. One significant difference between the 2016 and 2019 application is that the trees on the agricultural conversion area were felled and many of them removed. Trees that still on the property as are stumps which will be chipped and composted if the new project is permitted. The 2019 Agricultural Remediation plan also makes a commitment not to use herbicides for initial weed control and to make best efforts to secure a long term lease with an organic farmer so that the site can be operated as an organic farm.

1.0 Introduction

McTavish Resource and Management Consultants Ltd. (McTavish) was retained by Dagneault Planning Consultants Ltd. (the "client") to provide an agricultural remediation plan to convert the eastern 7.3 ha (18 acres) of the Mylora Golf Course located at 9500 No. 5 Road, Richmond BC (the "site") to a commercial agricultural operation (Figure 1). This conversion is part of the proposed redevelopment of the western section of the property to an independent school.

The purpose of this report is to provide relevant updates to the April 2016 Agricultural Remediation Plan (ARP) that was prepared for the City of Richmond (CoR) and the Agricultural Land Commission (ALC). This report summarizes the findings of eight documents prepared by McTavish that were previously submitted to the CoR. This document also provides an updated drainage plan that includes the removal of the previously designed open drainage ditch on the southern side of the property and instead recommends the installation of subsurface drainage that will discharge into the King Road ditch. This change improves the overall drainage and maximizes the area available for agricultural production.

1.1 Site Details

The site is located at 9500 No. 5 Road (PID 004-856-686) and is currently zoned as a golf course (GC). The legal description is SEC 30 BLK 4N RG 5W PL NWP775 Parcel A, Except Plan 2627, 51360, SRW 21305, REF 775 SEE R-030-373-551. The property is within the Agricultural Land Reserve (ALR).

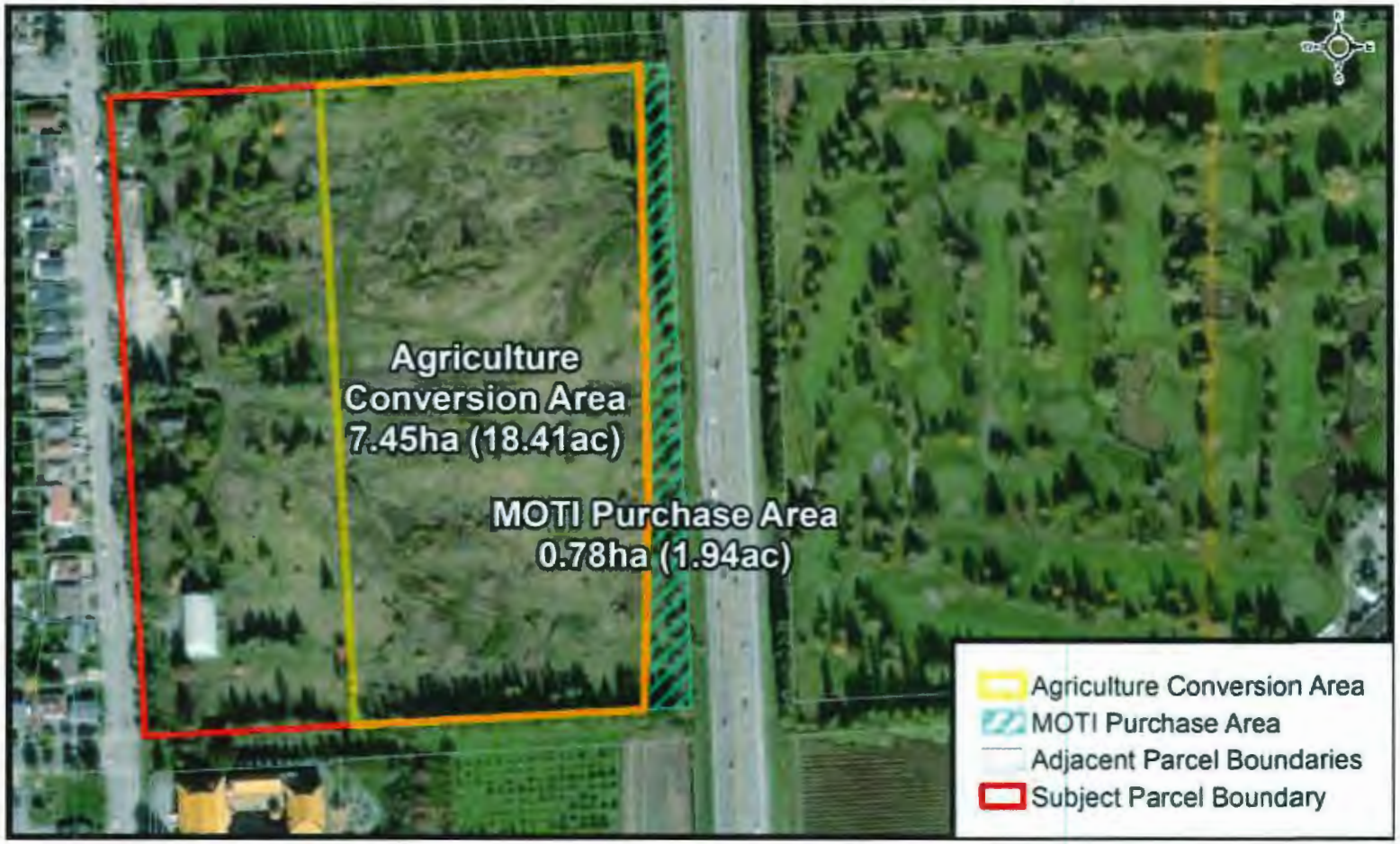

Figure 1: 9500 No. 5 Road and approximate area of proposed agriculture conversion area

1.2 Proposed Development

The site has historically been used as a golf course. The landowner proposes to develop the western 4 ha (10 acres) along No. 5 Road for institutional development. This development will be an independent school with no dormitories. The remaining 7.45 ha of land will be converted to agricultural land. Since the initiation of this project in 2013, the George Massey Tunnel Project (GMT) was announced by Ministry of Transportation and Infrastructure (MOTI) and cancelled. In the Bridge planning process MOTI purchased approximately 2 acres of the property that is adjacent to Highway 99. The land taken by MOTI varies in width from 18 metres at the north end to 28 metres at the south end. The total amount of land to be acquired is 0.78 ha or 1.94 acres as shown in Figure 1.

2.0 Methodology

The following Agricultural Plan has been developed by completing a desktop review of relevant sources, completing extensive soil investigation and a site assessment.

2.1 Desktop Review

A desktop review was conducted using mapped soil and agricultural capability classification of the study area using the BC Soil Information Finder Tool (BC SIFT).

2.2 Soil Investigation

In 2016, a total of 17 soil pits were installed on the site and recorded using a GPS (Figure 2). The soil of each fairway was sampled to a depth of 60 cm with a Dutch auger. Soil observations including horizon designation and depth were made at each soil pit. Soil texture was determined by hand texturing at each sample location.

Aggregate samples were taken from both the A and B horizon from each soil pit and laboratory tested at Exova Laboratory Inc. (now Element Materials Technology) in Surrey BC for macro/micronutrients as well as organic matter, electrical conductivity (EC) and acid reaction (pH).

Figure 2: Soil sample locations 2016

2.3 Agricultural Capability

The Land Capability Classification for Agriculture in British Columbia published by Kenk and Cotic (1983) is used to describe the potential for agriculture and any limitations for soil-based agriculture. This rating system "groups mineral and organic soils into seven classes which indicates the type and extent of any soil and climate parameters which affect the range of crops that can be grown and/or the management inputs required" Kenk and Cotic (1983). Class 1 is land best suited for agriculture and Class 7 is non-arable land. Various subclasses describe the limitations for agriculture.

The agricultural land capability classification indicates the range of suitable crops that can be grown and/or the management inputs required based on soil and climate parameters. The ratings can be *unimproved* based on the conditions that exist at the time of the survey without any management inputs) or *improved* (based on the rating after the limitations have been alleviated through improvements).

An agricultural capability assessment was carried out at the site within the area intended for agricultural use. The assessment was performed to make general observations of the site that impact the agricultural capability such as topography, rooting depth, drainage, soil texture and structure.

3.0 Site Investigation Results

3.1 Soil Investigation

To determine the site's suitability for agriculture and the steps necessary to convert the existing golf course back to agriculturally productive land, detailed investigation of soils, drainage, existing golf course features, and potential soil contamination took place between 2013 and 2015. Since there has been no activity on the site since then, soil testing was not repeated in 2018 or 2019.

Figure 3 shows a typical sample of the soils found on the site.

Figure 3 Soil sample showing mottled Bg horizon

3.1.1 Existing Soil Mapping

The existing soil mapping indicates that the soils on the subject property are in the Delta soil series which are common in central and western Delta and central Richmond (Figure 4). The parent material is medium to moderately fine-textured Fraser River deltaic deposits, with the surface texture varying from silt loam to silty clay loam that is usually a depth of 100 cm or greater.

Luttmerding (1981) describes the Delta Series:

> "Delta soils have a very dark gray or black, friable to firm, cultivated surface that is about 20 cm thick and usually contains 10 to 20 percent organic matter. The plowed surface layer (Ap

horizon) is underlain by a gleyed Bg horizon which is typically grayish-brown, firm to very firm, silty/clayey zone, about 30 cm thick which breaks to prismatic or blocky clods and contains some reddish-brown mottles. Underlying this is a Cg horizon about 30 cm thick of dark gray or grayish-brown, massive silty material containing common mottling. Below 100 cm is typically saline, sandy or silty material. The lower part is also often saline and high in sulphur compounds. The soil series is classified as an Orthic humic Gleysol: saline phase, and typically has an extremely to very strongly acid reaction throughout the soil profile." Figure 3 shows the soil profile of the Delta soil series as found on the subject property.

Figure 4 Mapped soil series at 9500 No. 5 Road, Richmond BC

3.2 On-site Soil Observations

On -site soil observations were made by sampling all fairways, greens and berm areas on the golf course.

Soil logs from the test pits are provided in Appendix I.

3.2.1 Physical Properties of Soil on Fairways

The hand textures of the Ap horizon indicate that soils ranged from sandy clay; silty clay; to silt loam. Since texturing was done by hand it is possible that some of the sandy textured soils are sandy clay loams or clay loams (Figure 5). It was assumed that the soils of the fairways represented the natural soil

because there was a clear Ap horizon; however, the samples are lower in organic matter and higher than normal in sand for Delta soils. This is probably due to sand topping of the fairways in an attempt to improve drainage.

Figure 5 Typical soil profile of fairways

3.2.2 Soil Compaction on Fairways

Heavy foot traffic on golf courses, particularly around tee boxes, is considered a potential issue in the management inputs needed to convert the property back into agricultural production. Compaction reduces the amount of large non-capillary pores in the soil (reducing hydraulic conductivity) and increases the small capillary pore spaces. This leads to an increase in water-holding capacity (not good on naturally wet soils) and decreases water infiltration. Compaction typically leads to an increase in standing water and increases the probability of fungal and other diseases. Compaction will also reduce air movement in the soil (oxygen diffusion rates) that in turn inhibits plant growth. It also leads to reduced root growth because roots cannot penetrate the compacted soil.

To determine the degree of compaction on this site a cone penetrometer was used to measure the density of the Ap soil horizon. Penetrometer readings were taken at 25-meter intervals from the tee box down the middle of each fairway towards the green. (McLaughlin et al., 2004) describes measuring soil compaction:

> Soil resistance (strength) is measured in units of pressure: 1 Mega Pascal (MPa) = 145 lb per square in (psi). Root growth is reduced by about half at a penetration resistance of 2.0 MPa

(290psi) and severely limited at 3.0 MPa (435 psi). The 2.0 MPa threshold is equivalent to a force of about 26 kg (57lb) to push the 0.5-inch diameter probe into the soil; penetration resistance in compacted soils can be two to four times this value. Higher soil water content typically results in lower penetrometer values, so assessments should be carried out at consistent soil water contents.

The readings were taken in the Ap horizon to a maximum depth of 15 cm (6 inches). The readings ranged from 200 to 500 psi with an average of 296 psi. Detailed penetrometer readings are provided in Appendix II. A t-test was run on the data at the 95% confidence interval which indicates that the penetrometer average is 296 psi plus or minus 19.6 psi. This means this reading can be expected 95 times out of 100 tests.

The levels of compaction found on the site are very high (above 300 psi) which will severely restrict roots. At 500 psi root penetration is impossible. In order to convert this property back to agriculture, measures will have to be taken to reduce the compaction by using typical cultivation methods such as subsoiling, ploughing and disking and the incorporation of organic matter. These will be discussed in more detail in the site remediation section of the report.

3.2.3 Chemical Properties of Soil on Fairways

Nitrogen levels for all soil pits are classified as deficient, which is common for soils on the west coast. Soils can be amended by the addition of organic or inorganic soil amendments. Soil test results for phosphorus and sulphur indicate marginal levels in samples taken from holes 1-18; these levels can be raised through the use of soil amendments. Soil micronutrients are all in the optimum range with the exceptions of boron and chlorine for holes 1-18. Soil sodium is low (< 30 ppm) so there will be no saline issues. The TEC (total nutrient exchange capacity of the soil) indicates that the soil will hold nutrients in reserve and gradually release them to the crop. The organic matter for fairways 1-9 is 6.6%, which is at the high end of normal. This reflects in the relatively high nutrient exchange capacity (TEC of 16.1 meq/100 g). The organic matter for fairways 10 to 18 is slightly lower at 5.5% but still within the normal range.

Soil test results are summarized in Tables 1 and 2 below and lab results are provided in Appendix III.

Table 1 Soil chemistry fairways 1 to 9

Analysis	Results (ppm unless indicated otherwise)	Comments
N (nitrogen)	4	Deficient
P (Phosphorus)	20	Marginal
K (Potassium)	217	Low optimum
S (Sulphur)	5	Marginal
Ca (Calcium)	1670	Optimum
Mg (Magnesium	200	Optimum
Fe (Iron)	421	Optimum
Cu (Copper)	2.4	Optimum
Zn (Zinc)	2.2	Low optimum
B (Boron)	0.2	Deficient
Mn (Manganese)	11.8	Low optimum
Cl (Chlorine)	5.0	Marginal
pH	6.4	Neutral
EC ((dS/m)	0.20	Good
OM (organic matter %)	6.6	High normal
BS (Base saturation)	65.3 %	
TEC (Exchange capacity)	16.1 (meq/100g)	Good
Na (Sodium)	<30 ppm	Good

Table 2 Soil chemistry fairways 10 to 18

Analysis	Results (ppm unless indicated otherwise)	Comments
N (nitrogen)	4	Deficient
P (Phosphorus)	12	Deficient
K (Potassium)	177	Low optimum
S (Sulphur)	4	Deficient
Ca (Calcium)	1170	Optimum
Mg (Magnesium	198	Optimum
Fe (Iron)	385	Optimum
Cu (Copper)	3.0	Optimum
Zn (Zinc)	2.4	Low optimum
B (Boron)	0.3	Deficient
Mn (Manganese)	13.1	Low optimum
Cl (Chlorine)	5	Marginal
pH	6.2	Neutral
EC (dS/m)	0.12	Good
OM (organic matter %)	5.5	Normal
BS (Base saturation)	60.9	
TEC (Exchange capacity)	13.0 (meq/100g)	Good
Na (Sodium)	<30 ppm	Good

Since the greens are built with a deep layer of medium to coarse-textured sand they are considered highly modified and will be removed as part of the agricultural conversion. Soil sampling on the greens therefore focused on the potential for soil contaminants as described in Section 3.3.

3.3 Golf Greens and Potential for Contaminants

All greens were impacted by fungal infections (see reddish-brown spots, Figure 6). A number of fungal diseases are common on bent grass golf greens these include dollar spot, pink snow mold (*Microdochium* patch and *Fusarium* patch), *Anthracnose*, and *Pythium* diseases (including *Pythium* blight and *Pythium* root rot or dysfunction). The obvious presence of fungal disease indicates that the golf course would have had a fungal control program that would have included extensive use of fungicides to control these diseases when the course was in operation. The major concern in terms of agricultural conversion of the golf course is not the actual presence of fungal diseases, but the types of fungicides that may have historically been used for control.

From the 1960s until the 1990s golf courses used fungicides whose active ingredients were either mercury or cadmium. Mercury was present in the inorganic formulation of mercurous and mercuric chlorides and organic forms with phenyl mercuric acetate and hydro-xymercurichlorophenol. Cadmium was incorporated into fungicides in both organic and inorganic forms including cadmium chloride (inorganic) and cadmium succinate (organic).

Figure 6 Reddish-brown spots indicating fungal disease on greens

With respect to the development of agriculture on the subject property, it was important to assess potential heavy metal contamination that may be present due to fungicide use on golf course greens. Prior to 1995 there was widespread use of mercurial fungicides to control snow mold (Brytus, 1997). These mercury compounds have a high affinity to absorb into soil complexes, leading to residual

contamination long after the fungicides were used. Based on this information the testing for heavy metal contamination is imperative to ensure mercury levels do not exceed agriculture standards.

Mercury and cadmium are the main concerns. To test for heavy metals for each green, samples were taken at the depths of 0-7.6 cm (0-3 inch), 7.62 cm-15.2 cm (3-6 inch), 15.2 cm-22.8 cm (6-9 inch) and 22.8 cm-30.4 cm (9-12 inch). Samples were taken using an Oakfield probe. The probe was cleaned between each set of samples taken. In total two sets of samples were submitted to the laboratory (composites of fairways 1-9 and 10-18). Each sample set consisted of an aggregate sample representing the 0-7.6 cm depth (Sample 1), and the 7.62 to 15.2 cm depth (Sample 2). The deeper samples were stored in a freezer pending analysis in case any metals above allowable limits were found in the shallower samples. The logic for testing the surface 15 cm (6 inches) is that heavy metals are not mobile in the soil since they bind to soil cations. Thus, if they were present, they would be found in the upper 15 cm of the soil.

Samples representing all 18 greens on the subject property were tested for heavy metals and compared to the agriculture regulation standard for allowable heavy metals for agriculture use. All samples were well below the maximum limit allowed for agriculture (see Table 3 and Appendix III). The allowable limit for Cadmium is 1.5 ppm, and concentrations were found at 0.11 in the 0-7.6cm (0 to 3 inch) depth (less than 10% of the allowable limit). The allowable limit for mercury is 0.6 ppm and this heavy metal was found at 0.039 in the 0-7.6 cm (0-3 inch) depth and 0.021 ppm in the 7.6-15 cm (3 to 6 inch) depth (about 5% of the allowable limit). Based on these results there are no concerns about mercury or cadmium contamination on this site.

Table 3 Heavy metal test results from golf greens

Substance	Allowable limits for agriculture – Human uptake of soil (ppm)[1]	Allowable limits for agriculture – Toxicity to Plants (ppm)[2]	Sample 1	Sample 2
			0 – 7.62 cm depth (ppm)	7.62 to 15.24 cm depth (ppm)
	Inorganic Substances			
Antimony	250	-	1.7	1.8
Arsenic	20	25	<0.20	<0.20
Barium	8500	700	35	42.3
Beryllium	85	150	0.16	0.19
Boron (hot water soluble)	2		0.15	0.08
Cadmium	20	30	0.11	0.14
Chloride ion (Cl-)	>1000 mg/g	350	-	-
Chromium (+3)			-	-
Chromium (+6)			-	-
Chromium (total)	100	200	29	32.5
Cobalt	25	45	5.56	6.56
Copper	3500	150	12.6	12.2
Fluoride			-	-
Lead	120	550	1.7	3.2
Mercury	10	40	0.039	0.021
Molybdenum	200	80	0.21	0.09
Nickel	450	150	35.9	29.4
Selenium	200	1.5	<0.3	<0.3

[1] BCCSR Standards consolidated to March 19, 2019 http://www.bclaws.ca/civix/document/id/crbc/crbc/375_96_multi

[2]

Silver	200		<0.2	<0.2
Sodium ion (Na+)	>1000mg/g		-	-
Sulphur (elemental)	2000		-	-
Thallium	2		<0.3	<0.3
Tin	25000		<0.2	<0.2
Vanadium	200	150	41.3	43.4
Zinc	10000	450	37.8	42.9

3.4 Constructed Berms and Potential for Contamination

Several constructed berms form part of the golf course infrastructure. It is the intention to use the soil material in the berms to fill in the existing water features on the golf course. Therefore, it is critical to ensure there are no contaminants in the berms.

Observations took place in 2013 and 2015 by excavating trenches in the berms with a tracked excavator and making visual observations for foreign material such as asphalt and concrete.

Twenty trenches were excavated in 2015 as shown in Figure 7. A small amount of asphalt was observed at GPS location 655 and 657. All other trenches were free of any foreign material.

Figure 7 Sample locations 2015

The 2013 sampling indicated that the large berm running east to west along fairway 14 (GPS locations 419 to 421) contained occasional pieces of concrete and asphalt (consistent with 2015 findings). The soil in this berm also contains some gravel and is of a texture more consistent with glacial till. This berm turns north at sample location 421 (Figure 8) and 660 (Figure 7). The section of the berm running north is constructed with soil material from the subject property and can be used as topsoil.

Figure 8 Sample locations 2013

The small amount of concrete and asphalt found in the berms are of no concern with respect to using the soil in the berms as fill material for the golf course water hazards. Even if there are small amounts of concrete or asphalt in this material, research has shown that aged asphalt and concrete do not leach significant quantities of deleterious material into the environment.

3.5 Drainage

Delta soils are generally poorly drained. Internal and surface drainage are both slow, resulting in high water tables over the winter months. During the growing season the water table gradually retreats, and droughty conditions sometimes develop during dry summers. The soil compaction that is found on the site will also reduce water infiltration and result in poorly drained soils.

During the site investigation in April 2013 surface water ponding occurred in some areas, along with soggy soil and generally poor drainage. Surface drains and shallow subsurface drain lines were encountered during the site investigation and one outlet was observed into the Highway 99 ditch approximately 0.30 m below the soil surface. Due to heavy brush along the ditch it was not possible to find other drain outlets.

Drainage needs to be improved in order to convert the property to agriculture. More details on drainage improvement are provided in the agricultural conversion plan (Section 4).

3.6 Agricultural Capability

Agricultural areas in the Lower Mainland have been mapped and the land rated for its agricultural capability. The capability is presented as unimproved (land without additional management inputs such as drainage or irrigation) and improved which is the highest capability the land can reach if all constraints are removed.

3.6.1 Agricultural Capability Based on Existing Mapping

The land capability class 4W. This means that based on the published mapping without improvement, 100% is of the site has an unimproved classification of 4 with the most significant limitation being W (excess wetness).

3.6.2 Agricultural Capability Based on Site Investigations

Site observations on the subject properties show soils to be consistent with the current land capability rating of 4W (Figure 8). Evidence of prolonged wetness was observed on many of the fairways. Mottling was present in many of the soil pits, indicating prolonged water saturation in the soil profile. This is common for Delta soils, which are classified as Orthic Humic Gleysol.

The site has been managed as a golf course for many years, and shallow subsurface drainage has been installed, however this is offset by very compacted soils and lack of freeboard for adequate drainage outlet depth at the Highway 99 ditch. Based on the saturated condition of the site observed during soil sampling in April 2013 and results of soil compaction testing in May 2013, it is the author's opinion that the site is presently a 4W classification.

Figure 9 Land capability for agriculture

Agricultural capability ratings are described below (Kenk & Cotic, 1983):

Class 4

Land in Class 4 has limitations which make it suitable for only a few crops, or the yield for a wide range crops is low, or the risk of crop failure is high. The limitations may seriously affect one or more of the following practices: timing and ease of tillage, planting, harvesting and methods of soil conservation.

Class 4W

Frequent or continuous occurrence of excess water during the growing period causes moderate crop damage and occasional crop loss. Water level is near the soil surface during most of the winter or until late spring, preventing seeding in some years, or the soil is very poorly drained.

With site remediation the land capability can be improved to 7:2WD 3:3WD. This means that 70% of the property can be improved to Class 2 with excess water restrictions, as well as a root-restricting layer within 50-75 cm of the soil surface. 30% of the property can be improved to Class 3 with excess water restrictions and a root-restricting layer within 25-50 cm of the soil surface. Class 3 capability is described below:

Class 3

Limitations are more severe than for Class 2, and management practices are more difficult to apply and maintain. Limitations may restrict the choice of suitable crops or affect one or more of the following practices: timing and ease of tillage, planting and harvesting, and methods of soil conservation.

Class 3W

Occasional occurrence of excess water during the growing period causes minor crop damage but no crop loss, or the occurrence of excess water during the winter months adversely affects perennial crops. Water level is near the soil surface until mid-spring, forcing late seeding, or the soil is poorly and, in some cases, imperfectly drained, or the water level is less than 20 cm below the soil surface.

Present land capability classifications have the potential to be improved by remediating current limitations. Such improvements typically include:

- Water control (ditching or tilling)
- Deep ploughing
- Amelioration of soil texture
- Cultivating to break up root-restricting layers

Class 2

Land has minor limitations that either require good ongoing management practices or may restrict the range of crops (or both). Soils are deep, hold moisture well, and can be managed with little difficulty.

Class 2D

On Class 2D land, root-restricting layer occurs within 50 to 75 cm of the mineral soil surface, or the upper 25 cm has a texture of silty-loam, clay loam, or sandy-clay that is slightly sticky-wet, or the slowest permeability usually 0.5 to 1.0 cm/hr in the upper 100cm.

Class 2W

Class 2W is described as having occasional occurrence of excess water during the growing period causing slight crop damage, or the occurrence of excess water duing the winter months adversely affecting deep rooted perennial crops. Water level is rarely, if ever, at the surface and excess water is within the upper 50 cm for only a short period (less than 2 weeks) during the year.

The options for improvement of the property will be discussed in Section 4.

3.7 Existing Golf Course Features

Various features need to be addressed when returning golf courses to commercial agriculture use. These include ponds, sand traps, tees and greens, various undulations in the terrain and berms, and landscaping. This section describes the various golf course features found on the property, and Section 4 describes the remediation strategy to remove these features to allow for commercial agriculture.

Bennett Surveying prepared a survey plan of the site that included the area and volume of all water hazards and the volume of the berms. This section of the report uses the Bennett survey plan (January 8, 2017) to describe the various golf course features and to develop a reclamation plan and budget.

3.7.1 Golf Course Water Hazards

Various water hazards located throughout the site can be seen in Figure 1. Based on the survey plan approximately 4000 m^2 (volume of 4600 m^3) of water hazards exist on the property and will need to be filled.

3.7.2 Sand Traps

Various sand traps are located throughout the site as can be seen in Figure 1. Based on the survey plan approximately 850 m^2 of sand traps will need to be filled or the sand removed, and topsoil applied.

3.7.3 Tees and Greens

Tees and greens are built above the natural soil surface with native soil and fine sand. Greens are highly compacted sand and tees are also compacted. The layer of sand is about 25 cm deep (9-10 inches). The sand can either be spread and incorporated into the soil or used as fill for the water hazards.

3.7.4 Undulations

The fairways include various undulations and minor landscaping. Some are planted with ornamentals or single trees. Most undulations are covered with grass. The minor undulations consist of contoured natural soil, and after potential removal of vegetation and trees, can be easily levelled.

3.7.5 Berms

The Mylora course includes one major berm running east-west alongside Fairway 14, with a north-south section near Highway 99. The east-west berm has numerous coniferous trees and ornamental plants. It is constructed with mostly clean fill (subsoil). The north-south part of the berm is constructed with native soil. Another berm runs across the north side of the property and is planted with conifers and poplars.

Based on the survey plan the total soil volume of the berms is 2418 m^3.

3.8 Summary of Site Investigations

Based on site investigations carried out between 2013 and 2017, there are no contaminants that will inhibit the conversion of the existing golf course to a commercial agriculture property. The soil chemical and physical properties are all within normal parameters for agricultural land in Richmond, and the low macro nutrient levels are consistent with areas that were not fertilized on a regular basis.

Existing golf course features such as berms, sand traps, tees, and greens have been identified and quantified. These numbers are used in the conversion/reclamation plan (Section 4) and in the budget presented in Section 8 of this report.

4.0 Agricultural Site Options

A number of agricultural options were developed and presented to the City of Richmond Agricultural Advisory Committee (AAC) for the conversion of the golf course into a farm operation. These included:

1. Developing a single commercial farm site:
   - Commercial agriculture requires the removal of all trees and berms, all greens and tee boxes, as well as the filling of all water hazards presently on the golf course.
2. Developing small lot urban agriculture plots of 2 acres each:
   - This scenario would need less site reclamation because a single contiguous unit of land would not be required (as is the case for a larger scale commercial operation). The proposed small agricultural lots would closely follow the existing fairways, with some removal of trees and filling of ponds and sand traps.
3. Use of the site as a community garden with multiple small gardens that could be leased/rented to residents of the local community:
   - Under this option it is feasible to leave the ponds and berms as aesthetic features but fill in the sand traps with topsoil to make them available for garden plots.

- This option would require that a significant area be developed for parking.

4. Develop a combination of community garden and 2-acre urban agriculture plots.
   - For more detailed information on each option refer to 'Agricultural Site Assessment of Land Located at 9500 Number 5 Road for Inclusion in the Agricultural Land Reserve and Conversion of Golf Course to Agriculture' prepared by McTavish Resource & Management Consultants and submitted to the CoR in June of 2013. Also refer to the 'Proposed Business Plan for Mylora Golf Course Agriculture Conversion Addendum II' prepared by McTavish Resource & Management Consultants and submitted to the CoR in September 2014.
   - The City of Richmond AAC and staff at the CoR carried out a detailed review of all proposals. They requested the option of conversion to an 18-acre commercial farm. Since all other options have been removed from consideration, the following site reclamation plan is based on converting 18 acres of golf course into a contiguous farmable area

5.0 Agriculture conversion plan

The objective of the agricultural conversion plan is to maximize the area of farmable land and to improve the agricultural capability of the site to Class 2W. This will be achieved by improving the drainage and carrying out the following activities:

- Tree and stump removal
- Grass and weed removal
- Berm removal
- Filling of water hazards
- Removal of sand traps
- Removal of existing irrigation and drain lines
- Leveling and crowning the land
- Break the existing sod by ploughing and disking
- Spreading salvaged topsoil over berm removal areas, sand traps and water hazards
- Preparing the land for planting
- Seeding a grass forage crop
- Constructing a farm access road along the Williams Road right of way[3]
- Installation of subsurface drainage
- Installing a 2-inch water from the city main to a standpipe inside the property line.

[3] Mapping indicates a road right of way along the south edge of the property. This right of way has never been registered, and discussions with the ALC staff indicate that the prefer to maximize the farmable area and are not in favour of agricultural land being removed for road right of ways.

5.1 Agriculture Capability Improvement Through Drainage Enhancements

A detailed analysis of site elevations, depth of the Highway 99 ditch and water table depth indicates that it is not possible to install a functioning gravity subsurface drainage system that discharges into Highway 99. Based on this assessment a subsurface drainage system has been designed by Mr. Geoff Hughes-Games PAg that will have an outlet into the King Road drainage ditch. The subsurface drainage plan is provided in Appendix V. Due to outlet depth restrictions the drainage lines will be placed at 12.5 m spacing and an outlet depth of 1.1 m at the King Road drainage ditch.

The installation of subsurface drainage allows the removal of the southern open ditch that was designed in the original proposal that was submitted to the CoR for the previous owner.

Based on site investigations the current land capability classifications can be improved to Class 2W with the installation of subsurface drainage, application of salvaged topsoil from the western 10 Acres and site regrading. Drainage improvements include:

- Grading and ditching to remove excess surface water
- Installation of subsurface drains the discharge into a holding pond and then to the King Road drainage ditch
- Deep ploughing/subsoiling to break up the root-restricting and water infiltration-restricting layers
- Improving soil texture through the addition of organic matter
- Disking and ploughing to incorporate organic matter and further break up the root-restricting layer
- Adding salvaged topsoil to increase the rooting layer depth
- Regrading to improve surface drainage

5.2 Use of Salvaged Topsoil

Six (6) acres of land in the proposed development area (western section of the property) are unencumbered with buildings or parking lots. In addition, MOTI has indicated that topsoil may be available for salvage from the 2 acres they have purchased that is adjacent to Highway 99. This results in a total of 8 acres available for topsoil salvage. The average topsoil depth of Delta soils is 20 cm (7.87 inches). Therefore there is approximately 6460 m^3 of topsoil [8 acres (340,480 ft^2) x 0.67-foot depth = 228,126 ft^3 = 8448 yd^3 = 6460 m^3] that will be available to assist in crowning the land to improve surface drainage.

The topsoil will be used to improve the grades from west to east, with a deeper application along the western section of the agricultural area to produce a greater slope from the west to the Highway 99 ditch.

5.3 Surface drainage management

The sloping and crowning of the agricultural area will ensure that all surface drainage from the site flows to the Highway 99 or King Road drainage ditch. Water will be transmitted by the existing King Road ditch on the north of the property, and by subsurface drainage as described in section 5.5 of this report.

Figure 10 Location of surface drainage features

5.4 Subsurface drainage system

A subsurface drainage system will be installed to improve the agricultural capability of the site. The drainage criteria applied are as follows:

- Drain spacing to 12.5 m to overcome reduced outlet invert depth from the recommended 1.2m to approximately 1m invert depth into the King Road ditch. This tightened spacing will allow for future perennial cropping and overcoming possible impacts of climate change
- Drain depth at pond outlet approximately 1.0 m
- Laterals: 100 mm perforated "Big-O" HDPE drainage tile at minimum of 0.10 % grade
- Mains: 150 mm non-perforated "big- O" HDPE drainage pipe at a minimum of 0.05% grade
- Mains outlet to enlarged existing ponds in NE corner of property
- Pond outlet via control structure (to allow for future controlled drainage, possible pumped outlet and to overcome future climate change issues)
- All existing ponds need to be dry filled and packed as drain lines will be crossing these and settling could impact effectiveness of drainage

A detailed drainage plan is provided in Appendix V.

5.5 Agricultural Capability Improvement Using Cultivation

The wetness (W) and root restricting (D) limitations can be mitigated by the application of cultivation techniques including:

- Subsoiling (deep ploughing) the soil to break up the root-restricting and water infiltration restricting layer;
- Amelioration of soil texture by the addition of organic matter; and
- Disking and ploughing to incorporate organic matter and further break up the root-restricting layer.

5.5.1 Subsoiling

Deep compaction which restricts water infiltration and root development can be improved by subsoiling with a wing-tined subsoiler to depths of 0.75 m (Figures 11 and 12). Criteria for effective subsoiling include:

- Tine spacing must be at least 1 x the working depth of the subsoiler
- Subsoiling must be done when the soil is relatively dry
- Subsoiling will take place prior to the installation of the subsurface drainage system

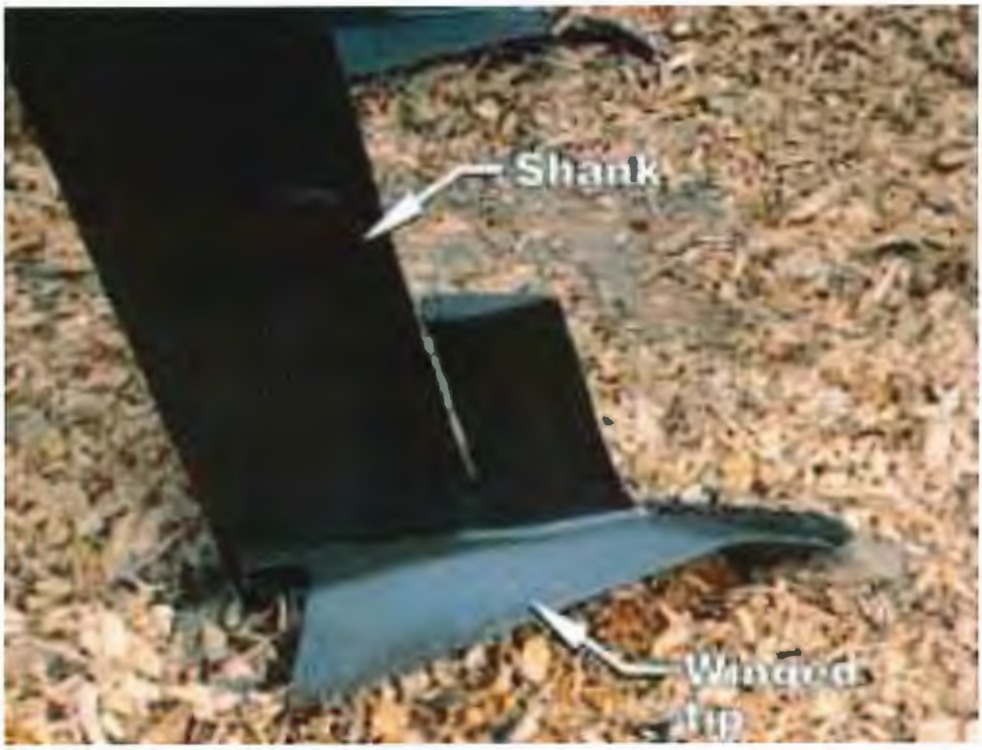

Figure 11 Example of a winged tine subsoiler

Figure 12 Example of a deep subsoiler (US DOA, 2008)

Correct use of subsoiling equipment includes pulling the subsoiler at the correct speed. Soil moisture must be low, and shanks must be the correct depth and spacing (Figure 13).

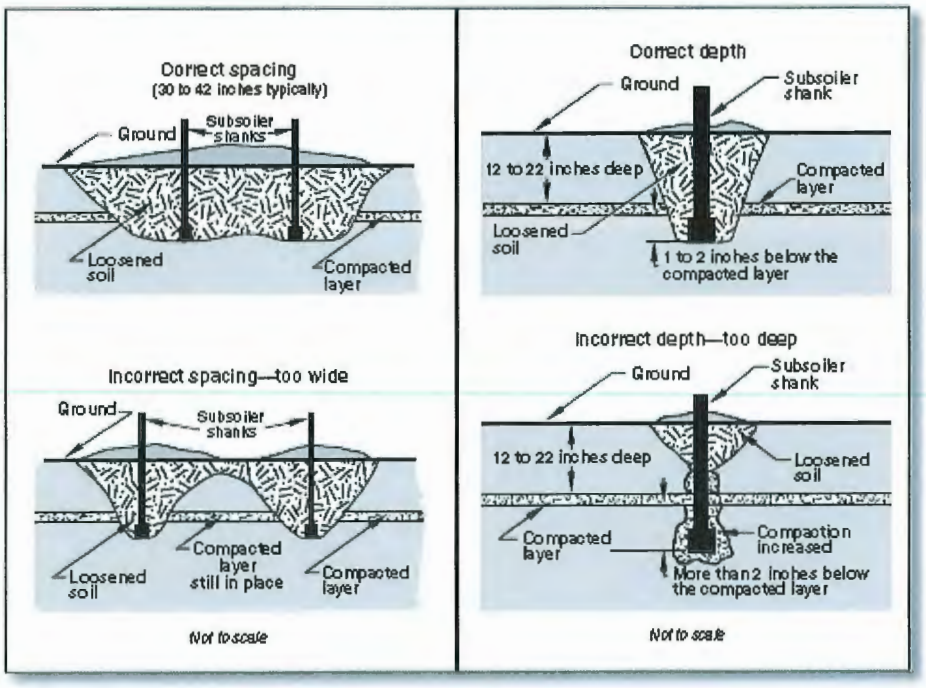

Figure 13 Correct use of a subsoiler

Horsepower requirements for subsoiling depend on soil moisture, the depth and thickness of the compacted layer, and (to a lesser extent) the soil type. Each shank may require from 30 to 75 horsepower. Equipment speed can affect subsoiling. Travel speed that is too high can cause excessive surface disturbance, bring subsoil materials to the surface, create furrows, and bury surface residues. Travel speed that is too slow may not lift and fracture the soil adequately.

To ensure subsoiling is carried out correctly and effectively, McTavish will direct the contractor to proceed when soil conditions are ideal, and McTavish personnel will be present on site to ensure correct depth and speed.

5.5.2 Ploughing

The site will be ploughed using a moldboard plough which slices, lifts, fractures and inverts the soil. Ploughing the site after subsoiling will have two positive impacts:

- Burying the existing sod and weeds
- Restoring tilth to the top layer of the soil

Ploughing should be done using a large mouldboard plough (see Figure 14) with a plough depth of at least 30 cm (12 inches).

Figure 14 Moldboard plough

5.5.3 Improving Soil Texture

Soil texture will be improved through the addition of organic matter. This will improve water infiltration and nutrient-holding capacity. All trees and branches will be chipped and composted on site and incorporated into the soil. Incorporation will be done by spreading the organic material with a manure spreader and using a tine cultivator to incorporate the material into the existing soil.

5.5.4 Summary of Agricultural Capability Improvements

The combination of subsurface drainage, addition of salvaged topsoil and cultivation will result in a significant improvement in the agricultural capability of this site. The cultivation practices and addition of organic matter as described will remove the root-restricting limitations. At the present time, the root-restricting layer ranges between 12 and 20 cm below the surface. Implementation of the recommendations will result in a root-restricting layer located between 40 and 50 cm below the surface. The new classification will therefore be 2D with respect to root restriction.

Installation of subsurface drainage, adding salvaged topsoil and subsoiling the entire site will significantly improve drainage and infiltration rates and increase the root penetration depth. The resulting agricultural capability classification will be 2W or possibly better with respect to the wetness limitation. Subsoiling and increased soil depth will increase the rooting depth and should improve the root penetration limitation to 2D.

The existing agricultural capability mapping shows that under best management practices the site would be 70% 2WDN and 30% 3WDN. The management inputs described will result in a rating for the property

of 100% 2WD. This will allow a wide range of crops to be grown on the site; these are described in section 6.6 Crop Potential.

5.6 Tree and Stump Removal

All trees were cut in 2017 and some of the trunks and most of the stumps still need to be removed.

- Trees of commercial value will be sold. All others will be chipped on site and cultivated into the soil.
- Chips will be small enough to quickly decompose, or a breaking disc must be used to cultivate chips into the soil after application.

A list of trees that have been felled are shown in Appendix VI

5.7 Grass and Weed Removal

Weed removal will be done by mechanical means. This will include:

- Mowing in the spring of the year that the project is permitted
- Ploughing as soon as soil moisture conditions allow
- Disking as soon as soil moisture condition allow.

By using only mechanical means for weed control the site will be suitable for organic agriculture.

5.8 Berm Removal

All berms will be removed, and the berm material used for filling the water hazards. Any asphalt or concrete encountered will be removed from the site.

5.9 Fill in Water Hazards

All water hazards will be pumped dry and then filled using on-site material from sand traps, berms and tee boxes. This must be done prior to the installation of the subsurface drainage system.

5.10 Remove Sand Traps

All sand will be removed from sand traps and used as fill in water hazards. Sand in excess of that required for filling of water hazards will be spread evenly over the site.

5.11 Break Existing Sod by Ploughing and Disking

The entire golf course area will be ploughed and disked to break the sod prior to land levelling.

5.12 Level and Crown Land

The site will be levelled with a grade of 0.25% from west to east toward the Highway 99 Road ditch and crowned in the middle with a grade of 0.25% toward the north and south.

5.13 Prepare the Land for Planting

Once land levelling is completed the site will be disked and prepared for seeding by harrowing the entire area.

5.14 Seed Forage Crop

The site will be seeded with a fall cover crop of either winter wheat or fall rye depending on the weather conditions and time of year when seeding takes place. The cover crop will need to be harvested or cultivated into the soil as green manure, and the site seeded in the spring with Richardson Seed (Terralink) General Pasture with Clover Mix or equivalent. Seed at 35 lbs. per acre (39.23 kg/ha).

To improve soil structure and infiltration it is important to seed a deep-rooting forage crop and maintain it for a minimum of 1 year after all reclamation activities are complete. This crop can then be harvested as hay or silage and therefore has commercial value.

5.15 Timeline for Site Reclamation Activities

It is critical that the work begin in the spring (May at the latest) to ensure that soil movement activities take place during the summer months when the soil is not saturated. It is also important to seed a cover crop by the end of the first week of October to ensure establishment before winter. Table 4 outlines the activities that need to take place and their appropriate timing.

Table 4 Site reclamation schedule

Item	Activity	Month
1	Tree and stump removal; chipping and composting	March to May
2	Mechanically remove existing vegetation including weed species in June	May (June)
3	Remove berms - place all material in water hazards	June to July
4	Fill water hazards	June to July
6	Topsoil - salvage topsoil from west lots and use on water hazards	June to July
5	Topsoil water hazards (minimum 20 cm of topsoil)	June to July
7	Remove sand traps and spread sand evenly over fairway	June to July
8	Apply topsoil to sand traps	June to July
9	Break sod, plough and disk the entire site	June
10	Spread topsoil over all berm areas (20 cm deep)	July to August

Item	Activity	Month
11	Remove irrigation and drain lines as encountered	As encountered
12	Subsoil, plough, disk, land level and crown (use remaining topsoil to improve grades)	August to September
13	Install subsurface drainage system	August - September
14	Prepare for planting (harrow)	September
15	Sample soil, prepare nutrient management plan and add nutrients as needed	September
16	Seed with winter cover crop	Mid-September to first week of October
17	Construct farm access road	July to August
18	Install 2-inch water line	August to September

6.0 Environmental Farm Plan Initiatives Included in Conversion

The agricultural conversion/reclamation will encompass initiatives that have been developed under the Environmental Farm Planning program (EFP) in BC. Areas within the EFP program that are relevant to the site conversion are:

- Crops
- Pest Management
- Soil amendments
- Biodiversity
- Soil
- Water
- Stewardship areas

6.1 Crops

The EFP program encourages farmers to plant cover crops to assist with the management of pests, nutrients and soil tilth. Cover crop practices also benefit wildlife and provide additional forage yield for the farm operator (BC MOA, 2013).

The agricultural reclamation plan recommends that a cover crop be seeded on sites in late September or early October to improve the soil and infiltration capacity of the soil.

6.2 Pest Management

The EFP program encourages the use of integrated pest management, control of noxious weeds, and reduced use of pesticides and herbicides.

Part of the planned activities is the control of all weeds on the property by cultivation only and not to use herbicides. The intention is for the property to be farmed as an organic farming operation so no herbicides or pesticides will be used.

6.3 Soil Amendments

The EFP program encourages the use of compost, animal manures and the management of soil fertility to match crop needs. This is done by developing nutrient management plans for individual farms.

The agricultural reclamation plan includes the natural composting of all wood material on the site (by spreading and cultivation) and incorporating this into the soil. Prior to the seeding of the fall cover crop, soil sampling will take place. A nutrient management plan will be developed, and appropriate nutrients will be added to meet crop needs.

6.4 Biodiversity

The EFP program encourages the maintenance and expansion of biodiversity on farms. Biodiversity as defined by the EFP Program Guide (BC MOA, 2013) as:

> The variety of all life forms plus the habitats and natural processes that support them. It includes all forms of life from bacteria, viruses and fungi to grasses, forbs, shrubs, trees, worms, insects, amphibians, reptiles, fish, birds, mammals, agricultural crops and livestock, and humans. Natural processes including, pollination, predator-prey relationships, and natural disturbances such as floods and wildfires.

The agricultural reclamation plan intends to leave all the trees that are presently growing along the northern property boundary and the existing ditch. The plan also integrates the planting of a bee/pollinator friendly vegetative strip along the north and south sides of the site. The combination of tree retention and plant of bee friendly species will maintain bird and small mammal habitat and increase pollinator populations

Incorporation of the composted wood material will increase soil biodiversity by providing organic matter including fungi, bacteria, and worms. These form the basis of a healthy and biodiverse soil ecosystem.

It should be noted that, based on the recommendations of the CoR and the City of Richmond AAC, all trees are being removed from the farmed portion of the site. This will reduce biodiversity on the site but is necessary to develop a large farm without impediments to conventional farm activities.

6.5 Soil

The EFP program encourage farmers to use management practices that improve or maintain a high level of soil quality. Soil quality factors include carbon to nitrogen ratios; compaction, soil contaminants; macronutrients (especially nitrogen); organic matter; cultivation and erosion control.

6.5.1 Carbon to Nitrogen Ratio

A nutrient management plan will be developed which will ensure that there is adequate nitrogen to balance the carbon added via the composted wood chips.

6.5.2 Compaction

The agricultural reclamation plan includes significant work to reduce the compaction of soil on the site and improve soil tilth.

6.5.3 Soil Contaminants

The entire site has been tested for contaminants and none are present.

6.5.4 Macronutrients

A nutrient management plan will be developed which will ensure that all nutrients are balanced with crop needs, and that nitrogen does not leach from the soil.

6.5.5 Organic Matter

Organic matter will be increased through the addition of the decomposed wood chips and the incorporation of crop residue.

6.5.6 Cultivation

Cultivation techniques will be used as described in the report. Subsoiling will improve drainage; ploughing and disking will be only used to the degree necessary to break up compaction and improve rooting depth. These are all cultivation practices that will improve the soil, including soil biodiversity and tilth.

6.5.7 Erosion Control

A cover crop will be seeded in the fall to ensure that there is soil cover to reduce water and wind erosion.

6.6 Crop Potential

The anticipated agricultural capability of the site after the conversion from the existing golf course to a commercial farm is 2WD. A wide variety of climatically suitable crops will be capable of growing on this site. Some of these crops are:

- Annual legumes
- Blueberries
- Cereals
- Cole crops
- Corn
- Perennial forage crops
- Root vegetables (except carrots)
- Shallow rooted annual vegetables (except celery)
- Strawberries

An example of specific crops is provided in Table 5 which are the top ten crops presently grown in Richmond and on similar soil and drainage conditions.

Table 5 Top 10 crops grown in Richmond (CoR, 2011)

Crop	Hectares	% of crops	% of census farms	% of ALR
Cranberries	858	38.9%	11.4%	21.5%
Blueberries	556	25.2%	33.2%	13.9%
Other Hay	320	14.5%	8.1%	8.0%
Potatoes	88	4.0%	2.8%	2.2%
Cabbage	64	2.9%	4.7%	1.6%
Strawberries	57	2.6%	2.4%	1.4%
Sweet Corn	52	2.4%	4.7%	1.3%
Chinese Cabbage	51	2.3%	10.0%	1.3%
Pumpkins	25	1.1%	5.2%	0.6%
Squash and Zucchini	21	1.0%	7.1%	0.5%
Total	**2,092**	**94.7%**	**89.6%**	**52.4%**

6.7 Farm Road Access

A farm access road will be constructed to access the easterly agriculture lands. This is a farm access road and not a public road and is therefore designed to meet farm standards as outlined in the BC EFP Program Reference Guide (2013).

- The road width will be 6m wide allowing ample room for farm vehicles and trucks to enter and leave the farm site.
- Road base will be compacted well drained gravel
- Road surface will be clean, non-contaminated permeable materials.
- A drawing of the farm road is provided in Appendix VII.

6.8 Cost Estimate

A number of quotations have been obtained to carry out the work listed below:

Item	Activity
1	Tree and stump removal; chipping and composting
2	Remove existing vegetation including all weeds in June
3	Remove berms - place all material in water hazards
4	Fill water hazards
6	Topsoil - salvage topsoil from west lots and use on water hazards
5	Topsoil water hazards (minimum 20 cm of topsoil)
7	Remove sand traps and spread sand evenly over fairway
8	Apply topsoil to sand traps
9	Break sod, plough and disk the entire site
10	Spread topsoil over all berm areas (20 cm deep)
11	Remove irrigation and drain lines as encountered
12	Subsoil, plough, disk, land level and crown (use remaining topsoil to improve grades)
13	Install subsurface drainage on the entire agricultural portion of the property
14	Prepare for planting (harrow)
15	Seed with winter cover crop
16	Construct farm access road
17	Install 2-inch water line

The cost to carry out the work as described is estimated at $702,440.00 (note that the trees have been felled and many removed from the site). Stump removal still needs to take place and the remaining felled trees and branches chipped and cultivated into the soil.

6.9 Monitoring Plan

McTavish has been retained to monitor the agricultural remediation at 9500 No. 5 Road, Richmond BC. McTavish will ensure that the remediation plan is carried out as outlined above according to the proposed timeline. McTavish will monitor farming activities for three growing seasons to ensure that the agriculture is continued following remediation. Monitoring activities will include, but is not limited to the following:

- Regular inspection during remediation works
- Inspection at substantial completion of the remediation works outlined above

- Provision of site-monitoring reports

7.0 Closing

I trust that this report provides the information that you require at this time. If you have any questions regarding this report, please contact the undersigned.

MCTAVISH RESOURCE & MANAGEMENT CONSULTANTS LTD.

Bruce McTavish MSc RPBio PAg
President | Principal Agrologist

Contributing authors:

Hubert Timmenga PhD, PAg, CMC
Geoff Hughes-Games PAg

8.0 References

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Appendix I. Soil Logs

Sample & GPS locations	Depth (cm)	Horizon	Texture	Biological activity	Other comments
Fairway 1	0-10 10-30 29-	Ap Bg Cg	Sandy clay Silty clay Silty clay	Worms/grass roots	
Fairway 2	0-13 13-	Ap Cg	Clay sand Silty clay	Roots	
Fairway 3 GPS 404	0-15 15-35 35-	Ap Bg Cg	Sandy clay Silty clay Silty clay	Roots	Red mottles
Fairway 4 GPS 405	0-20 20-	Ap Cg	Sandy clay Pure sand	Roots/worms	Construction sand
Fairway 5 GPS 406	0-15 15-35 35-	Ap Bg Cg	Silty clay Silty clay Silty clay	Roots Worms	
Fairway 6 GPS 407	0-15 15-27 27-	Ap Bg Cg	Sandy clay Silty clay Silty clay	Roots	Construction sand
Fairway 8 GPS 408	0-13 13-35 35-	Ap Bg Cg	Sandy clay Sandy clay Sandy clay	Roots	
Fairway 9 GPS 409	0-10 10-33 33-	Ap Bg Cg	Sandy clay Silty clay Silty clay	Roots/worms	
Fairway 10 GPS 410	0-12 12-28 29-	Ap Bg Cg	Sandy clay Silty clay Silty clay	Roots	
Fairway 11 GPS 411	0-22 22-56 56-	Ap Cgh Cg	Sand Silty loam Silty clay	Roots Organic matter	Sand
Fairway 12 GPS 412	0-13 13-28 28-	Ap Bg Cg	Sandy silt Silty clay Silty clay	Roots/worms	Sand
Fairway 13 GPS 413	0-15 15-25 25-	Ap Bg Cg	Sandy silt Silty clay Silty clay	Loose blocky	Sand
Fairway 14	0-17	Ap	Sandy silt	Roots	Sand

Sample & GPS locations	Depth (cm)	Horizon	Texture	Biological activity	Other comments
GPS 414	17-33 33-	Bg Cg	Silty clay Silty clay		
Fairway 15 GPS 415	0-13 13-28 28-	Ap Bg Cg	Sandy silt Silty clay Silty clay	Roots/worms	Sand
Fairway 16 GPS 416	0-15 15-23 23-	Ap Bg Cg	Sandy silt Silty sand Silty clay	Worms/roots	Sand
Fairway 17 GPS 417	0-10 10-23 23-	Apg Bg Cg	Sandy silt Silt Sand	Roots	Drainpipe
Fairway 18 GPS 418	0-23 23-38 38-	Ap Bg Cg	Sand Silty clay Silty clay		Sand Water table

Appendix II. Penetrometer Results

Fairway #	Distance from tee (meters)	Penetrometer reading (psi)
1	25	250
	50	250
	75	300
2	25	500
	50	250
	75	200
3	25	500
	50	250
	75	400
	100	350
	125	300
4	25	200
	50	400
	75	400
5	25	250
	50	250
	75	300
	100	400
	125	250
6	25	400
	50	400
7	25	250
	50	250
	75	300
	100	300
8	25	200
	50	200
	75	400

Fairway #	Distance from tee (meters)	Penetrometer reading (psi)
9	25	300
	50	250
10	25	300
	50	300
	75	300
11	25	500
	50	300
12	25	250
	50	350
	75	200
	100	300
13	25	250
	50	300
	75	300
14	25	250
	50	200
	75	250
	100	400
15	25	300
	50	300
	75	300
	100	350
16	25	300
	50	200
	75	250
17	25	200
	50	200
	75	200

Fairway #	Distance from tee (meters)	Penetrometer reading (psi)
	100	300
18	25	300
	50	300
	75	300

Appendix III. Soil Contaminants Lab Results and Agricultural Soil Testing

Exova
#104, 19575-55 A Ave.
Surrey, British Columbia
V3S 8P8, Canada

T: +1 (604) 514-3322
F: +1 (604) 514-3323
E: Surrey@exova.com
W: www.exova.com

Exova

Analytical Report

Bill To: McTavish Resource &
Report To: McTavish Resource &
2858 Bayview Street
Surrey, BC, Canada
V4A 2Z4
Attn: Bruce McTavish
Sampled By:
Company:

Project:
ID:
Name:
Location:
LSD:
P.O.:
Acct code:

Lot ID: **931863**
Control Number: B08505
Date Received: Apr 24, 2013
Date Reported: Apr 29, 2013
Report Number: 1620729

		Reference Number	931863-1	931863-2		
		Sample Date				
		Sample Time				
		Sample Location				
		Sample Description	0-3" Metals	3-6" Metals		
		Matrix	Soil	Soil		
Analyte		**Units**	**Results**	**Results**	**Results**	**Nominal Detection Limit**
Hot Water Soluble						
Boron	Water Soluble	ug/g	0.15	0.08		0.02
Metals Strong Acid Digestion						
Antimony	Strong Acid Extractable	ug/g	1.7	1.8		0.5
Arsenic	Strong Acid Extractable	ug/g	<0.20	<0.20		0.2
Barium	Strong Acid Extractable	ug/g	35.0	42.3		0.03
Beryllium	Strong Acid Extractable	ug/g	0.16	0.19		0.01
Cadmium	Strong Acid Extractable	ug/g	0.11	0.14		0.05
Chromium	Strong Acid Extractable	ug/g	29.0	32.5		0.04
Cobalt	Strong Acid Extractable	ug/g	5.56	6.56		0.05
Copper	Strong Acid Extractable	ug/g	12.6	12.2		0.05
Lead	Strong Acid Extractable	ug/g	1.7	3.2		0.3
Lithium	Strong Acid Extractable	ug/g	7.9	8.9		0.1
Mercury	Strong Acid Extractable	ug/g	0.039	0.021		0.003
Molybdenum	Strong Acid Extractable	ug/g	0.21	0.09		0.05
Nickel	Strong Acid Extractable	ug/g	35.9	29.4		0.1
Selenium	Strong Acid Extractable	ug/g	<0.3	<0.3		0.3
Silver	Strong Acid Extractable	ug/g	<0.2	<0.2		0.2
Strontium	Strong Acid Extractable	ug/g	19.2	21.7		0.02
Thallium	Strong Acid Extractable	ug/g	<0.3	<0.3		0.3
Tin	Strong Acid Extractable	ug/g	<0.2	<0.2		0.2
Vanadium	Strong Acid Extractable	ug/g	41.3	43.4		0.1
Zinc	Strong Acid Extractable	ug/g	37.8	42.9		0.1
Soil Acidity						
pH	1:2 Soil:Water	pH	5.6	5.6		0.5

Exova
#104, 19575-55 A Ave.
Surrey, British Columbia
V3S 8P8, Canada

T: +1 (604) 514-3322
F: +1 (604) 514-3323
E: Surrey@exova.com
W: www.exova.com

Exova

Methodology and Notes

Bill To: McTavish Resource &
Report To: McTavish Resource &
2858 Bayview Street
Surrey, BC, Canada
V4A 2Z4
Attn: Bruce McTavish
Sampled By:
Company:

Project:
ID:
Name:
Location:
LSD:
P.O.:
Acct code:

Lot ID: **931863**
Control Number: B08505
Date Received: Apr 24, 2013
Date Reported: Apr 29, 2013
Report Number: 1820729

Method of Analysis

Method Name	Reference	Method	Date Analysis Started	Location
Boron - Hot Water Soluble (Surrey)	McKeague	* Hot Water Soluble Boron - Azomethine -H Method, 4.61	26-Apr-13	Exova Surrey
Metals (Strong Acid Leachable) in soils (Surrey)	B.C M.O.E	* Strong Acid Leachable Metals (SALM) in Soil, V 1.0, SALM	26-Apr-13	Exova Surrey
pH and EC - 1:2 (Surrey)	Carter	* Soil pH (1:2 Water), 16.2	29-Apr-13	Exova Surrey

Reference Method Modified

References

McKeague	Manual on Soil Sampling and Methods of Analysis
B.C.M.O.E	B.C Ministry of Environment

Guidelines

Guideline Description	BC CSR Agricultural Soil Standards
Guideline Source	British Columbia Contaminated Sites Regulation; Schedule 4 (Generic) and 5 (Matrix) Soil Standards, BC CSR, Reg. 375/96
Guideline Comments	AL = Agricultural Standards, Column II, Schedule 4 Generic Numerical Soil Standards and Schedule 5 Matrix Numerical Soil Standards (lowest standard for all Site-Specific Factors). Refer to BC CSR for complete standards and additional information.

Comments:

Holes 1 - 9

Exova
#104, 19575-55 A Ave
Surrey, British Columbia
V3S 8P8, Canada

T: +1 (604) 514-3322
F: +1 (604) 514-3323
E: Surrey@exova.com
W www.exova.com

Exova

Farm Soil Analysis

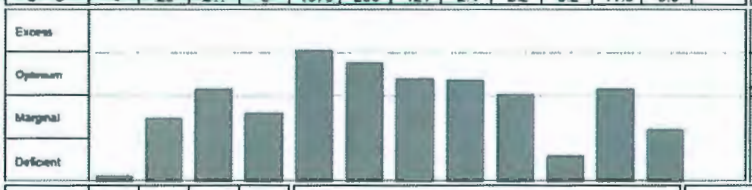
Bill To.	McTavish Resource & Management Consultants	Grower Name.		Lot Number.	931863
Report To:	McTavish Resource & Management Consultants	Client's Sample Id:	B1 Holes 1-9	Report Number:	1820731
		Field Id:		Date Received:	Apr 24, 2013
	2858 Bayview Street	Acres:		Disposal Date:	May 24, 2013
	Surrey, BC., Canada	Legal Location:		Report Date:	Apr 26, 2013
	V4A 2Z4	Last Crop.	Crop not provided	Arrival Condition:	
Agreement:	36394				

Nutrient analysis (ppm)

Depth	N*	P	K	S**	Ca	Mg	Fe	Cu	Zn	B	Mn	Cl	BCarbP
0" - 6"	4	20	217	5	1670	200	421	2.4	2.2	0.2	11.6	5.0	

Soil Quality

pH	EC(dS/m)	OM(%)	Sample#
6.4	0.20	6.6	4393910



Alkaline	Very Toxic	High		
Neutral	Toxic	Normal		
Acidic	Caution	Low		
Very Acidic	Good	Very Low		

Total lbs/acre	7	40	433	11
Estimated lbs/acre	14	40	433	22

Texture n/a Hand Texture n/a
Sand n/a Silt n/a Clay n/a
Ammonium n/a
Lime 1.8 T/ac Buffer pH 6.4 Est. N Release n/a C:N Ratio n/a

BS 65.3 %
Ca 51.6 % Mg 10.2 % Na <0.8 % K 3.4 %
TEC 16.1 meq/100g Na <30 ppm

*Nitrate-N **Sulfate-S n/a = not analysed

RECOMMENDATIONS FOR BALANCED CROP NUTRITION

	Golf fairways					Golf greens				
Macro-nutrients	Yield	N	P2O5	K2O	S	Yield	N	P2O5	K2O	S
Growing Condition	bu/ac	To be added (lbs/acre)				bu/ac	To be added (lbs/acre)			
Excellent	4	121	113	25	6	4	121	113	25	6
Average	3	104	100	15	2	3	104	100	15	2
Your Goal	0					0				
Removal Rate (Seed/Total)	4	0 / 0	0 / 0	0 / 0	0 / 0	4	0 / 0	0 / 0	0 / 0	0 / 0
Micro-nutrients	Iron	Copper	Zinc	Boron	Manganese	Iron	Copper	Zinc	Boron	Manganese
To be added (lbs/ac)	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0

The ideal pH range is 6.0 to 7.5

Nitrogen recommendations are based on nitrate-N only. Fertilization history should also be considered.

Comments:

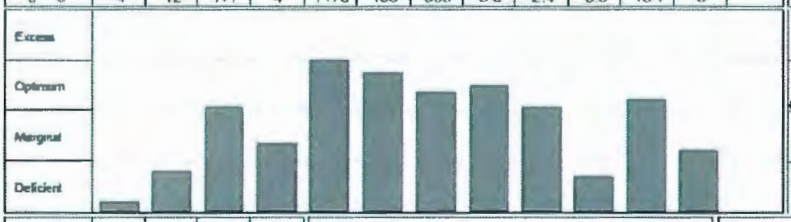
Holes 10 to 18

Nutrient analysis (ppm)

Depth	N*	P	K	S**	Ca	Mg	Fe	Cu	Zn	B	Mn	Cl	BCarbP
0" - 6"	4	12	177	4	1170	198	385	3.0	2.4	0.3	13.1	6	

Soil Quality

pH	EC(dS/m)	OM(%)	Sample#
6.2	0.12	5.5	4393911



Alkaline	Very Toxic	High	
Neutral	Toxic	Normal	
Acidic	Caution	Low	
Very Acidic	Good	Very Low	

Total lbs/acre	7	24	354	8
Estimated lbs/acre	15	24	354	16

Texture n/a Hand Texture n/a
Sand n/a Silt n/a Clay n/a
Ammonium n/a
Lime 1.6 T/ac Buffer pH 6.5 Est. N Release n/a C:N Ratio n/a

BS 60.9 %
Ca 44.9 % Mg 12.5 % Na <1 % K 3.5 %
TEC 13.0 meq/100g Na <30 ppm

Appendix IV. Construction Quantities

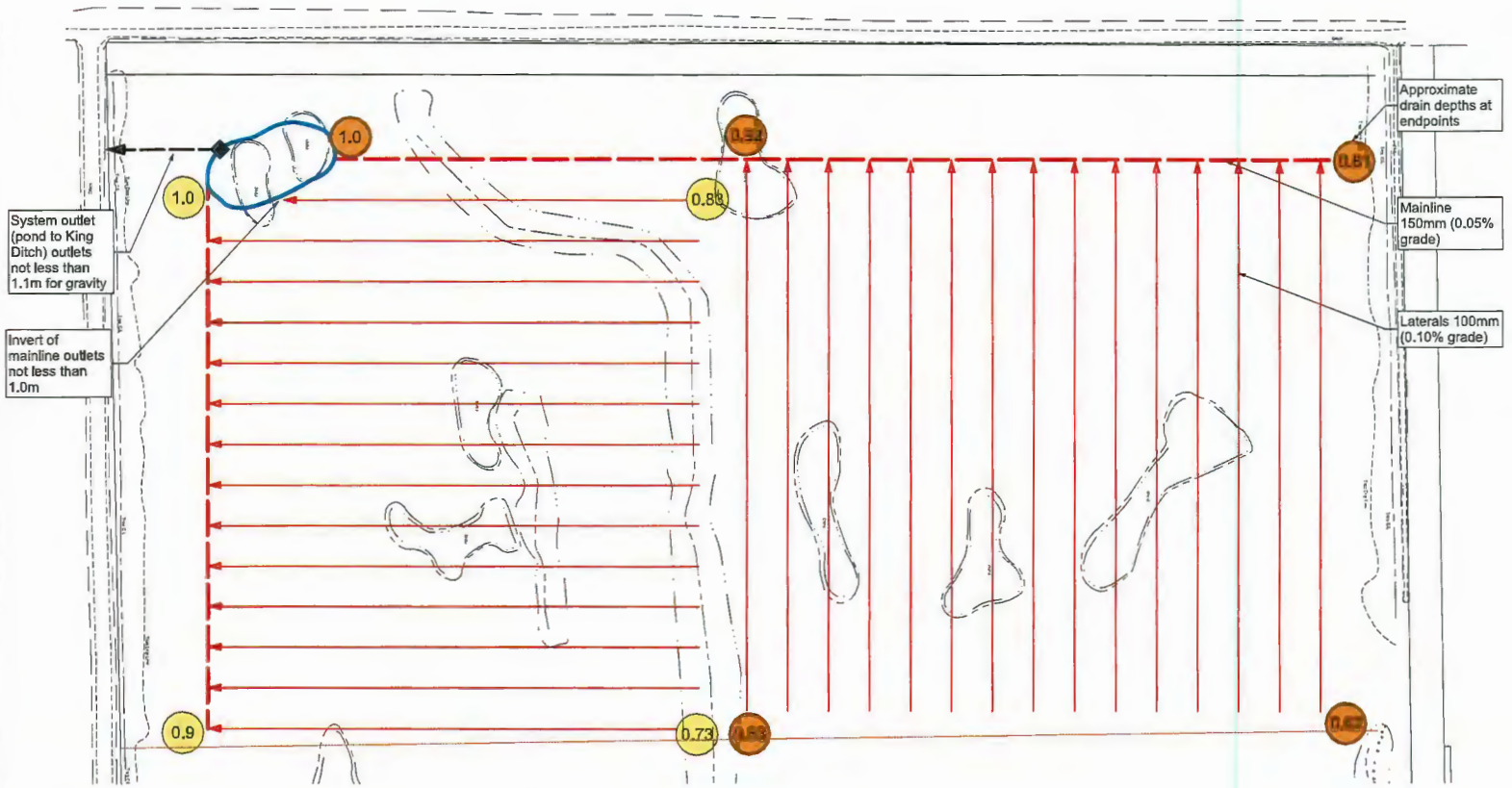
Item	Activity	Quantity	Unit
1	Tree and stump removal and chipping. These have been felled and many removed, however there are still ~ ½ left to remove or chip and stumps to remove	486	Trees
2	Mechanical weed management	~18	Acres
3	Break sod, plough and disk	~18	Acres
4	Fill water hazard	4600	m^3
4a	Fill water hazard	4000	m^2
5	Topsoil water hazards minimum 20cm	1200	m^3
6	Topsoil - salvage topsoil from west lots and use on water hazards	1500	m^3
7	Remove sand traps and spread sand evenly over fairway (best estimate to be verified in field)	850	m^2
7a	Remove sand traps and spread sand evenly over fairway (best estimate to be verified in field)	425	m^3
8	Topsoil sand traps with on-site topsoil	850	m^2
9	Remove berms - place all material in water hazards	2500	m^3
10	Spread topsoil over all berm areas 20 cm deep	4000	m^2
10a	Spread topsoil over all berm areas 20 cm deep	1200	m^3
11	Remove irrigation and drain lines as encountered	as found	-
12	Level, plough, disc, land level and crown	~18	Acres
13	Install subsurface drainage	~18	Acres
14	Prepare for planting (harrow)	~18	Acres
15	Seed with deep-rooting forage crop	~18	Acres
16	Construct farm access road	120	m
17	Install 2-inch water line	115	m

Appendix V. Subsurface Drainage Analysis and Design

Drain Design Notes

Design Drain Depth
1.2 m (not achievable due to grade and outlet conditions)

Design Drain Spacing
(Delta Soil Series) 16 m (recommend tightening to ensure response to climate change and options for perennial cropping)
To overcome shallow depth –consider a pumped outlet or tighten spacing.
Tighten spacing to **12.5 m** initial invert on outlet (pond or King Ditch) at **1.0+m**



PLN - 160

McTAVISH
RESOURCE & MANAGEMENT CONSULTANTS LTD.

N

PROJECT TITLE
Pythagoras Academy
No. 5 Rd,
Richmond BC

DRAWING TITLE
Subsurface Drainage Plan

CLIENT
Dagneault Planning Consultants Ltd

ISSUED FOR / REVISION		
1	19.06.26	Draft for Review
2	19.08.26	Tree boom and berm extended
3	19.08.30	Tree roots and inverts amended
4	19.07.01	Drainage plan appended
5		

PROJECT NO	BD-05
ASSESSED BY	TMWH
DRAWN BY	SF
CHECKED BY	BM
DATE	JULY 02 2019
SCALE	1:800

DRAWING NUMBER
SD1/1

Appendix VI. Trees to be Removed

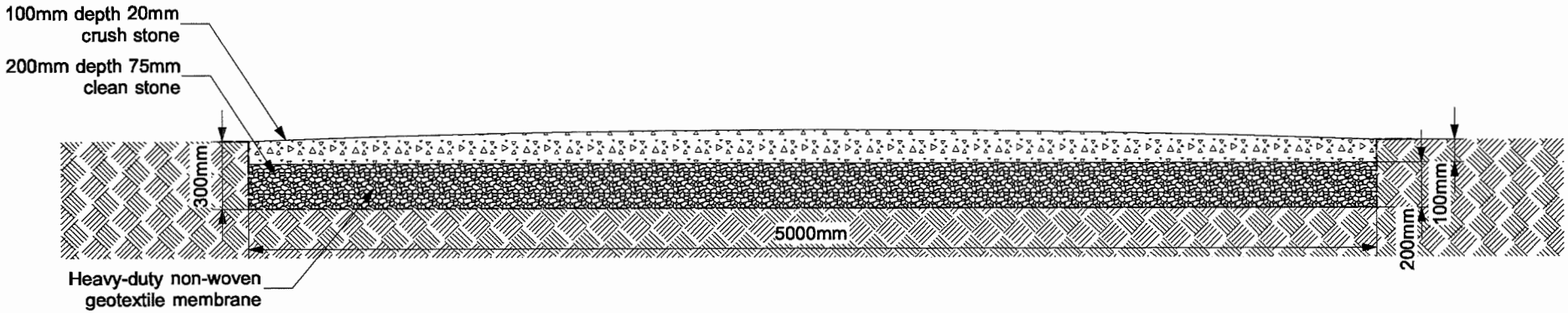
(Note: All the trees in the area for agricultural production were felled and removed in 2017)

Species	Total Quantity		Species	Total Quantity
DBH (cm)	Quantity		DBH (cm)	Quantity
***Abies* sp.**	**8**		***Prunus pissardi***	**8**
20	2		15	2
50	6		20	2
***Acer* sp.**	**30**		40	4
5	1		***Pseudotsuga menziesii***	**8**
10	7		40	4
15	13		45	2
20	3		50	2
30	1		***Quercus* sp.**	**9**
35	2		50	1
40	1		52	2
45	2		57	1
***Betula* sp.**	**282**		57	1
15	48		60	2
20	64		62	2
25	52		***Salix babylonica***	**2**
30	70		55	2
35	28		***Sorbus* sp.**	**2**
40	14		15	2
45	6		***Thuja* sp.**	**107**
Picea pungens	**15**		15	17
20	1		20	5
25	2		25	18
30	3		30	16
35	2		35	26
40	5		40	10
60	2		45	2
***Pinus* sp.**	**14**		50	11
50	2		55	2
55	2			
60	4			
70	2			
80	4			
Subtotal Column a	**349**		**Subtotal Column b**	**136**
Grand total (Column a + b)			**485**	

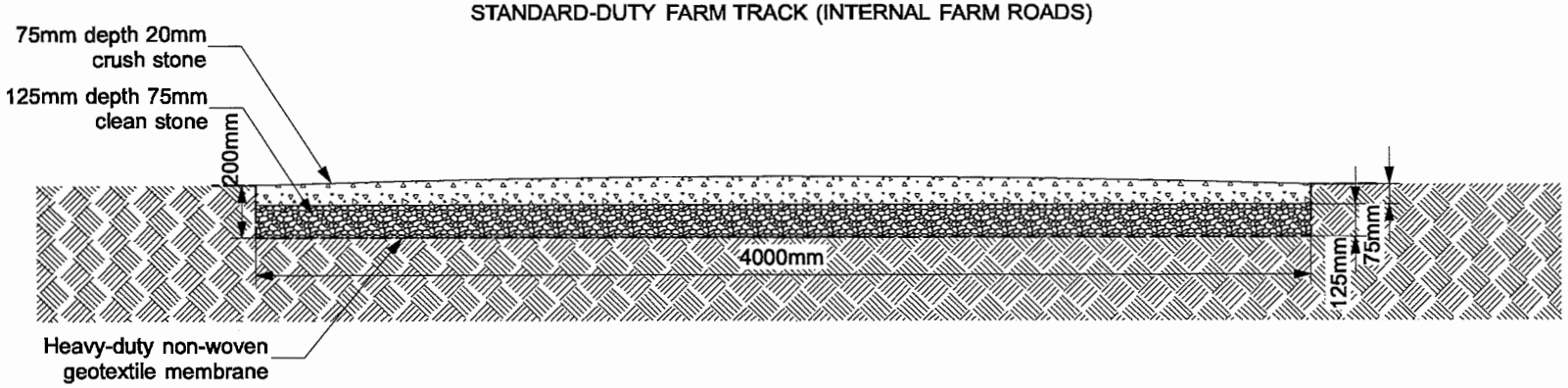
Appendix VII. Road Design

The following represents the recommended agricultural road design that will allow for access to the site from No. 5 Road and meet requirements of the City of Richmond. The road design is intended to reduce the amount of land that is removed from agricultural production. The access road length is limited to the western portion of the property and is intended strictly of access to the eastern agricultural acreage. The internal farm road has been incorporated into the design to meet the City of Richmond requirements and extends along the southern and eastern perimeter of the property. The internal farm road is 4 m wide to reduce the impact on the amount of land available for farming.

HEAVY-DUTY FARM TRACK (ROAD TO INSIDE FARM GATE)



STANDARD-DUTY FARM TRACK (INTERNAL FARM ROADS)



1 Mylora Farm Road Typical Sections
Scale: 1:25

PLN - 163

#203 – 19292 60 Avenue
Surrey BC
V3S 3M2

Memorandum – Revision 2

Date: October 25, 2019
To: Brian Dagneault
From: Bruce McTavish, PAg
Re: Detailed budget for Agricultural Conversion old Mylora Golf Course

McTavish Resource & Management Consultants Ltd. (McTavish) had developed a detailed budget for the conversion of the old Mylora Golf course (Pythagoras Academy) to a state that is ready for farming. McTavish has extensive recent experience in similar projects including:

- Land levelling farms to obtain adequate soil cover over pipelines including seed bed preparation and seeding
- Restoration of 23 km of the Fortis Pipeline Expansion in Surrey and Coquitlam.

The budget is based on McTavish experience and quotations from subcontractors.

The detailed budget follows the outline presented in the McTavish report Agricultural Conversion Plan Pythagoras Academy – 9500 No. 5 Rd, Richmond BC October 25 2019.

The detailed budget presented in this memo amalgamates activities into logical groups based on the remediation activities. Table 1 summarizes the budget, with detailed calculations provided in the body of the document.

The estimated cost to carry out the proposed work is $702,440.00

Bruce McTavish, MSc MBA PAg RPBio
President | Senior Agrologist

Table 1: Budget Summary Table

Items (From original McTavish Activity item list)	Activity	Quantity	Unit	Associated Costs
1	Tree and stump removal and chipping. These have been felled and many removed, however there are still ~ ½ left to remove or chip and stumps to remove	486	Trees	$75,000.00
2, 9	Break sod, plough and disk	~18	Acres	$14,000.00
3	Remove berms and use material to fill in all water hazards	4600	m^3	$180,000.00
4,5,6,10	Topsoil - salvage topsoil from west lots and use on water hazards, and sand traps, ensure a minimum of 20 cm of topsoil	1500	m^3	$54,000.00
7, 8	Remove sand traps and spread sand evenly over fairway or use as additional material to fill water hazards	1225	m^2	$12,000.00
11	Remove irrigation and drain lines as encountered, $10,000 allocated for labour and equipment	as found	-	$10,000.00
12	Level, plough, disc, land level and crown	~18	Acres	$50,000.00
13	Install subsurface drainage	~18	Acres	$27,000.00
14,15	Prepare for planting; disc for weed control and power harrow	~18	Acres	$5,500.00
16	Seed with deep-rooting forage crop	~18	Acres	$5,700.00
17	Construct farm access road main access road	120	m	$25,000.00
17a	Farm road to back of property running east/west total of 550m. Road build by stripping 6 inches of topsoil, adding geotextile, 3 inches of 4 inch minus rock and 3 inches of road mulch	550	104	$57,200.00
18	Install water line 1m inside the agricultural area and stand pipe/hydrant/backflow preventor			$5,000.00
	Contingency 10%			$52,040.00
	Project management and supervision, safety, environmental permits as necessary, construction infrastructure, traffic control.			$130,000.00
	Total			**$702,440.00**

#203 – 19292 60 Avenue
Surrey BC
V3S 3M2

Item 1: Tree and stump removal; chipping and composting

Days	Activity	Unit cost	Total
28	Excavator (2 excavators for 14 days_	$1,500.00	$42,000.00
14	Chipper	$1,000.00	$14,000.00
5	Dump truck to hauls material that cannot be chipped	$800.00	$4,000.00
	Dump Fees		$5,000.00
28	Labour (2 labourers for 14 days)	$500.00	$5,000.00
14	Foreman	$800.00	$5,000.00
	Subtotal		**$75,000.00**

Items 2 and 9: Spray with herbicide *now only mechanical weed removal using agricultural cultivation equipment*

Days	Activity	Unit cost	Total
4	Mow area prior to cultivation	$1,000.00	$4,000.00
1	Plough	$2,500.00	$2,500.00
3	Breaking disk	$2,500.00	$7,500.00
	Subtotal		**$14,000.00**

Item 3: Remove berms and use material to fill in all water hazards

Days	Activity	Unit cost	Total
40	Use large scraper haulers to move material, 2 machines for 20 days	$4,500.00	**$180,000.00**

Items 4,5 6 and 10: Topsoil - salvage topsoil from west lots and use on water hazards, and sand traps, spread sand from sand traps and ensure a minimum of 20 cm of topsoil

Days	Activity	Unit cost	Total
12	2 hauler scrapers for 6 days	$4,500.00	**$54,000.00**

Items 7 and 8: Remove sand traps and spread sand evenly over fairway or use as additional material to fill water hazards

Days	Activity	Unit cost	Total
2	Excavator	$1,500.00	**$3,000.00**
2	Hauler scrapers to spread	$4,500.00	**$9,000.00**
	Subtotal		**$12,000.00**

Item 12: Level, plough, disc, land level and crown

Days	Activity	Unit cost	Total
10	Final land leveling using laser guided hauler scrapers, 2 machines for 5 days	$4,500.00	$45,000.00
2	Cultivate using large breaking disk	$2,500.00	$5,000.00
	Subtotal		**$50,000.00**

Item 13: Install subsurface drainage

Days	Activity	Unit cost	Total
~18	Quoted cost to install drainage is $1500/acre by Valley Drainage	$1,500.00	**$27,000.00**

Items 14 and 15: Prepare for planting; disc for weed control and power harrow

Days	Activity	Unit cost	Total
1	Cultivate 1 additional time for weed control	$2,500.00	$2,500.00
2	Power harrow	$1,500.00	$3,000.00
	Subtotal		**$5,500.00**

Item 16: Seed with deep-rooting forage crop

Days	Activity	Unit cost	Total
2 days	Seed cover crop for first year	1500	**$3,000.00**
900 lbs	Purchase seed (50 lbs/acre)	$3/lb	**$2,700.00**
	Subtotal		**$5,700.00**

Item 17: Construct 120m of farm road

Days	Activity	Unit cost	Total
120m road	Strip topsoil, install geotextile, build road 5 m wide with a 8 inch base of 4 inch minus gravel, finish with 4 inches of ¾ inch minus (road mulch). **Quote by Universal Contracting Ltd.**	$208.33/m	**$25,000.00**

Item 17a: Construct 550m of farm road from end of the heavy traffic farm road, running east to the Highway 99 RoW and paralleling Highway 99 running north/south along the eastern side of the property

Days	Activity	Unit cost	Total
550m road	Strip topsoil, install geotextile, build road 4 m wide with a 3 inch base of 4 inch minus gravel, finish with 3 inches of ¾ inch minus (road mulch). **Quote by Universal Contracting Ltd.**	$104/m	**$57,200.00**

Item 18 Install irrigation line

	Activity	Unit cost	Total
~ 1m designated farm area	Install water line including necessary connections and hydrants in the field **Quote from Universal Contracting Ltd.**	$5,500	**$5,500.00**

McTAVISH
RESOURCE & MANAGEMENT
CONSULTANTS LTD.

#203 – 19292 60 Avenue
Surrey, BC
V3S 3M2

November 4, 2019

To: Brian Dagneault

From: Bruce McTavish, MSc MBA PAg RPBio

Re: Bonding for Agriculture Pythagoras

I believe a reasonable bond would be the cost of production for one year of $176,400 (round to $176,000) and the capital start up costs of $87,790 (round to $88,000) for a total bond of $264,000. This ensures that the required capital start up expenses are covered as are one full year of production costs.

Best regards,

Bruce McTavish, MSc MBA PAg RPBio
President | Senior Agrologist

Memorandum of Understanding

_This document signifies that:

Miles Smart
2271 No 4 Rd, Richmond BC, V6X2L4

and

Robert Smart
2351 No 4 Rd, Richmond BC, V6X2L4

(dba Cherry Lane Farm) express an interest in leasing 18 acres of land at 9500 No 5 Rd from:

9500 Properties LP
10560 Sorrel Drive, Richmond BC, V7E 2B2

Cherry Lane Farm intends to run a certified organic mixed vegetable operation on this land. All arable portions of the leased portion are to be brought into production within 3 years. We intend to bring several shipping containers to serve as storage for machinery and produce.

Our agreed yearly lease rate is $1,000/acre for the arable land (exact area to be determined by survey), and a onetime damage deposit payment of $1000.00. Such a lease would be in the structure of an initial 5 year lease with three 5 year options (right of first refusal). Lease rates reflecting market rates are to be negotiated at lease renewal.

Obligations of the lessor:
-The entirety of the lease portion of the land and margins shall be prepared according the specifications presented in the document "Agricultural Conversion Plan Pythagoras Academy - 9500 No. 5 Road, Richmond BC." October 25, 2019
-Building and maintaining the fence between the school and the farm.
-Installation of separate water meter for lessee.
-Provision of adequate water supply for irrigation purposes, and maintenance of prebuilt irrigation infrastructure.

-Payment of taxes and dues pertaining to the ownership of the land.

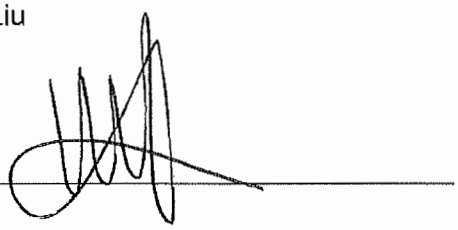
Obligations of the lessee:

-Prompt payment of utilities exclusively used by lessee.
-Prompt payment of lease to lessor at agreed upon date.
-Respect and protect riparian areas and tree buffer areas from farm activities.
-Minimize any nuisances in regard to smell, noise, and dust where feasible.
-Repair drainage tile damaged by field operations.
-Maintain farm access road.

Miles Smart

Nov. 5. 2019.

Winfred Liu



Date

Nov 5, 2019