



Date: March 12, 2015

TO: Park Board Chair and Commissioners
FROM: General Manager - Vancouver Board of Parks and Recreation
SUBJECT: Musqueam Park - Proposed Metro Vancouver Regional District Highbury Interceptor Air Management Facility Location

RECOMMENDATION

THAT the Vancouver Park Board approve the recommended location (Option 3) for Metro Vancouver's Highbury Interceptor Air Management Facility in Musqueam Park;
THAT this facility include a public accessible washroom; and
FURTHER THAT a right-of-way document for the development and operations of the facility be formed to the satisfaction of the Park Board General Manager.

POLICY

The Board approves major changes in Vancouver parks including the design and development of parks.

BACKGROUND

The Highbury Interceptor is a large regional sewer that is owned by Metro Vancouver (Greater Vancouver Sewerage and Drainage District). It runs under Highbury Street from West 4th Avenue in Vancouver southward to the Fraser River. The interceptor conveys over 90 percent of the sewage from Vancouver and parts of Burnaby to the Iona Island Wastewater Treatment Plant in Richmond. The location and profile of the interceptor are shown in Appendix 1 and Appendix 2. Odour complaints from residents living near the Highbury Interceptor have increased in recent years, prompting Metro Vancouver to seek a solution.

Addressing the odour issues along the major sewers in Vancouver requires the construction of three odour management facilities: one at the north end of the interceptor, one at the south end and one in or near to China Creek North Park. In addition to reducing odour these facilities will also help to remove corrosive gases, prolonging the life of the sewers. The facility proposed at the south end of the interceptor (Musqueam Park) is in the preliminary design phase and is the subject of this report. The other two facilities will be addressed through separate processes.

Metro Vancouver hired a consultant to undertake the design of the Highbury Interceptor Air Management Facility. The consultant is experienced in successfully delivering a number of similar air management facility projects across North America. Metro Vancouver has been working collaboratively with the community, City of Vancouver and Vancouver Park Board staff since the preliminary design of the facility, starting in September 2013. Engagement

with the Musqueam First Nation is also on-going. Vancouver Park Board staff have provided input into the public engagement and consultation process for the facility since that time.

Public engagement for the proposed Highbury Interceptor Air Management Facility began in October 2013 to inform residents of plans for the facility and to gather input on potential impacts, mitigation measures, location and design features. Substantive input was received and several steps to address concerns have been made including:

- Minimizing the physical footprint of the facility by placing as much as possible underground (this has now been implemented in the preliminary design);
- Seeking Vancouver Coastal Health's opinion to identify any potential health impacts;
- Including landscaping to screen the building and minimize its appearance;
- Integrating the vent stack into the building, instead of as a stand-alone structure;
- Utilizing anti-graffiti materials;
- Installing motion-sensitive lighting to enhance security while minimizing light pollution in accordance with Dark Sky lighting principles and saving energy; and
- Measuring the air quality and emissions before and after facility becomes operational and reporting the results back to residents.

The purpose of this report is to seek approval of the proposed location for this facility in Musqueam Park (which includes a public washroom) so that detailed design and statutory right-of-way for construction and operations of the air management facility can occur.

DISCUSSION

Air Management Facility - Description

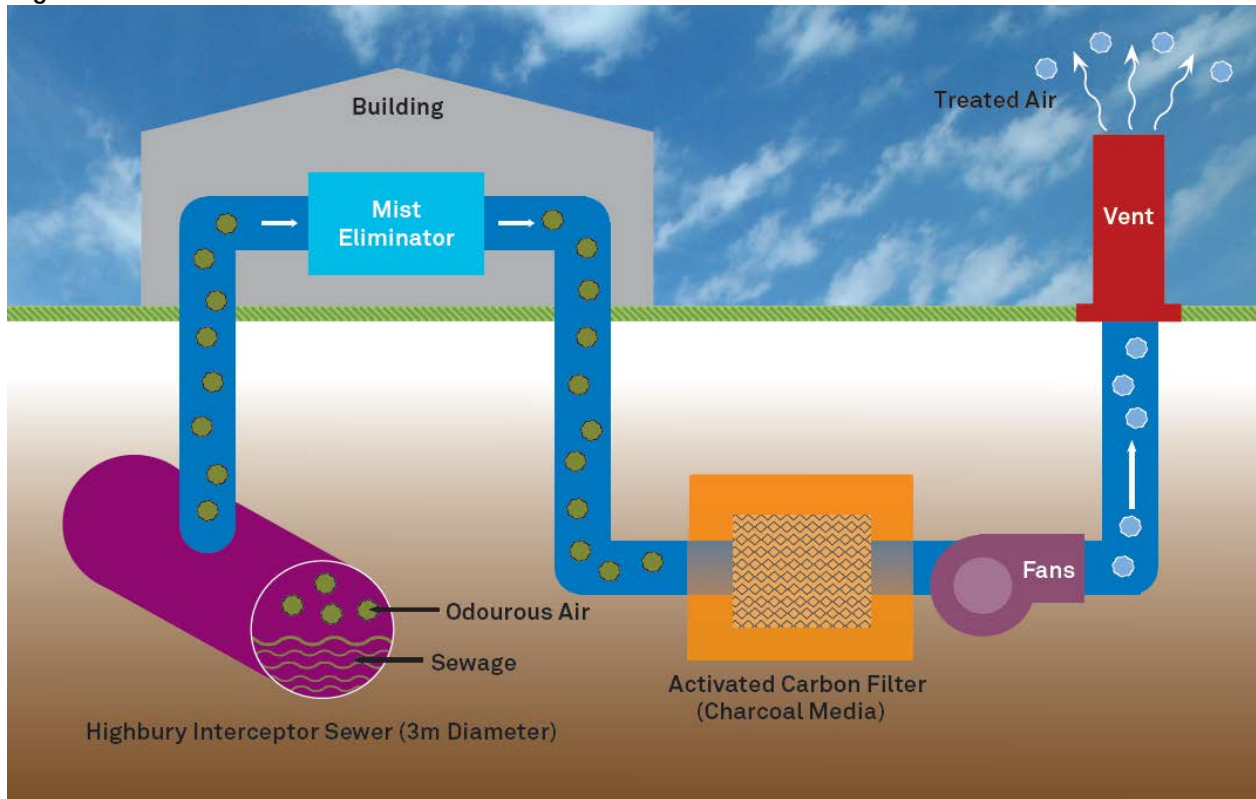
The facility would include the construction of a building, a temporary access road for construction, and a permanent access road for on-going maintenance.

The above-ground building will be approximately 8 metres by 11 metres and 1.5 storeys high—similar in size to a three-car garage. The permanent access road would be made of a permeable grass and concrete surface to facilitate heavy vehicles yet allowing the grass to grow through it and minimize the visual impact of the road.

Odour Removal Process

As Figure 1 depicts, the air management facility consists of fans that pull odorous air from the sewer, a mist eliminator to remove moisture, an activated carbon scrubber to strip odours, and a vent stack to release and disperse treated air. Odour stripping by a carbon media is a proven technology commonly used in many jurisdictions. Ottawa and Toronto have successfully integrated carbon scrubbers into park settings. Carbon Scrubbers are able to remove 99.5 percent of odour present in sewer gas while the remaining 0.5 percent of odour is dispersed as it mixes with surrounding air. This design will meet the most stringent odour emission standards and detection criteria in North America.

Figure 1 - Odour Removal Process



Air Management Facility Location

Metro Vancouver has carefully considered potential locations for air management facilities along the Highbury Interceptor.

From a technical perspective, the facility cannot be located north of Musqueam Park as the sewer is too far below the surface to extract odorous air, with the deepest section approximately 80 metres below ground. The facility also cannot be located south of Musqueam Park because of the proximity to the treatment plant: high water levels in the plant back up the flow in the sewer, filling the pipe completely with sewage and leaving little or no air space to allow the movement of gas toward the air management facility. Reference to Appendix 2 - Section through Vancouver at Highbury Street illustrates these technical constraints. Options outside the Park were also considered but were not pursued because of the close proximity to homes. Locating the facility in Musqueam Park creates a significant buffer from nearby residences that could not be achieved through the use of nearby on-street Rights-of-Way or the acquisition of private residential property.

Public Washroom

The air management facility provides an opportunity to locate a public washroom for field users within the park. There is a need for a washroom in Musqueam Park because it is a destination for sports groups from outside the neighbourhood. Metro Vancouver is committed to including washroom facilities within the facility at their cost. After construction, the Vancouver Park Board will be responsible for controlling access to the washroom and for maintaining the washroom.

Metro Vancouver and Park Board staff are working together to determine the design and layout of the washroom, while access will be limited to holders of field use permits that have been issued keys. Park Board staff identified the need for safe washroom design through appropriate orientation, lighting and landscaping that follows Crime Prevention Through Environmental Design (CPTED) principles. The public washroom will be designed for wheelchair accessibility.

Environment

The facility will include sustainable features in the building such as low flow toilets, high efficiency lighting and natural lighting (day lighting). Motion sensitive exterior lighting will be included, which increases energy efficiency and reduces potential impacts on wildlife. Concrete used in the building will include fly ash, which reduces embedded energy and greenhouse gas emissions. The feasibility of natural and recyclable materials will be investigated as part of the detailed design. The project will also provide an opportunity to remove invasive plant species including English ivy and Japanese knotweed.

Engagement and Consultation Process and Results

Stakeholders

All relevant stakeholder groups were informed about the project and invited to attend meetings where they were encouraged to provide comment. These groups were identified through discussions with Vancouver Park Board staff, internet searches for community organizations, and requests to stakeholders to identify other stakeholders where possible.

The community organizations that provided input on behalf of their membership were:

- The West Southlands Ratepayers Association, a local association representing residents in the area;
- Residents who live immediately surrounding the park, some of which are members of the West Southlands Ratepayers Association;
- The Vancouver United Football Club, Vancouver's largest youth soccer club, which uses the soccer field at Musqueam Park for much of the year; and
- The Vancouver Field Sports Federation, whose membership includes representatives from organized baseball, football (tackle, touch, flag), cricket, field hockey, field lacrosse, rugby, soccer, softball, track, and ultimate (disc sports).

Several individuals who live nearby or own property immediately surrounding the park but were not members of the West Southlands Ratepayers Association also provided input on an ongoing basis.

Metro Vancouver also worked closely with Musqueam Indian Band staff to identify and understand their concerns as the majority of the odour complaints over recent years have originated from the Musqueam Indian Reserve. Musqueam Indian Band staff have identified this as a critical project for improving air quality and public health in their community, and they are eager to see the project be completed quickly.

A list of stakeholders is included in Appendix 3 - Stakeholders and in a separate report titled *Highbury Interceptor Air Management Facility at Musqueam Park: Engagement and Consultation Report*.

Engagement Process

This section summarizes the input received from October 2013 to August 2014. Key engagement activities during this period included two public open houses, three on-site meetings with local residents, two plenary-style meetings with key stakeholder groups, an online survey, and on-going input received from the public via email. The open house held in June was the best attended, with 46 attendees and 69 survey responses received. See Appendix 4 - Public Meetings & Events for a complete list of meetings and events.

Metro Vancouver promoted open houses and the online survey through a variety of channels including its own website, newspaper advertisements, emails, flyers delivered to households and community centres, park signs, Vancouver Park Board and City of Vancouver websites and social media. During this process, Metro Vancouver received a wide variety of comments, questions, suggestions, and concerns that have influenced the design of the facility. Key topics discussed include:

- Facility location
- Facility design
- Noise
- Odour and health

Each of these topics is discussed in more detail below.

Facility Location within the Park

Several location options were considered within the park. Of these, staff recommend three viable options as shown in Figure 2: Location Option 1 situated off Highbury Street close to the tree line within the off-leash dog park; Location Option 2 located between two sports fields off Alma Street and 48th Avenue; and Location Option 3 located within the forested area adjacent to the west sports field.

Figure 2 - Air Management Facility Location Options



Options 1 and 2 were presented at the June 2014 open house and subsequent online survey, with participants being asked to indicate which facility location was preferred. Through this process there was no majority consensus on a preferred location. As neither location Option 1 or Option 2 appeared to sufficiently address community concerns, Metro Vancouver and Vancouver Park Board staff explored Location Option 3 in February 2015. In comparison to Options 1 and 2, Option 3 is located farthest away from residents and embedded into the forest, substantially minimizing any visual impact to area residents. More information associated with these results is included in Appendix 5 - Location Preference - Feedback Form and Survey Results.

After much consideration staff recommends a new location Option 3 over Location Options 1 and 2, based on the following reasons:

- The location will not encroach on open green space in the park, which maximizes recreational opportunities;
- Trees (both existing trees and replacement trees) would largely screen the view from nearby residences - this is the least visible option for residents;
- The entry doors will face the existing pathway and sports fields that benefit from the washroom;
- The location does not impact the dog off leash area;
- The proposed location is approximately 140 metres away from the nearest residences - significantly farther than Location Option 1;

- The cost, and therefore the financial impact to taxpayers, is approximately \$300,000 lower than Location Option 2; and
- The project provides a good opportunity for invasive species removal and urban forest enhancements.

Given its location, placement of the facility at location Option 3 will require the removal of 15 trees and additional mitigative actions may be required on an additional 11 trees located in close proximity to the construction footprint. Metro Vancouver completed a tree survey and assessment report, which indicates that the majority of the bylaw tree species within the proposed construction footprint are Black Cottonwoods and Red Alders which are not long lived species with few ecosystem services. A component of this project will ensure that stewardship efforts focus on replanting longer lived coniferous species as well as the removal of existing invasive species in order to enhance the health and resiliency of the urban forest.

A detailed aerial map showing distances of each location option from the nearest residences is given in *Appendix 11 - Aerial Map of Location Options*. Also, a summary of the Option evaluations is provided in Appendix 12 - Location Option Comparison Table.

Facility Design

The proposed design and landscaping of the facility is a significant concern for residents as noted at the October 2013 and June 2014 open houses. In response to this, Metro Vancouver re-designed the facility to have the majority of the components underground, reducing the above-ground footprint by 50% in order to address the need to preserve open green space.

During the open houses, Metro Vancouver presented options for the architectural style of the facility, including a contemporary design using modern materials that would create a feature building in the park, and a traditional design using natural materials that would blend with the park environment (See Appendix 6 - Design and Landscape Options). Overall, participants indicated a preference for the traditional building design with landscaping to screen it and act as a visual buffer. Respondents also requested the inclusion of motion-sensitive security lighting. The design of the facility and washroom layout will be finalized with input from the City of Vancouver's Real Estate and Facilities Management Department.

Some residents also expressed concerns over graffiti and the safety and security of the washroom facility. Metro Vancouver has committed to incorporate anti-graffiti materials into the architectural design.

Noise

Several residents near the facility expressed concern that the noise from the facility could be audible in their homes. Metro Vancouver has measured existing noise levels and will measure noise levels once the facility is constructed to ensure the facility meets the City of Vancouver's bylaw requirements (night time maximum 45dBA). Based on theoretical values, the nearest residents (those within 80m distance from Location Option 1) should not be able to hear the facility over the background noise (measured at 35dBA) at night. Therefore, noise should not be an issue with Location Options 3 which is much farther from residences than Location Option 1 and buffered by the woodlot. This information is represented in Appendix 7 - Noise Level Comparison.

Odour and Health

Many residents expressed concern that the facility would create odour issues in the park and surrounding residences. Using computer air dispersion modelling, Metro Vancouver's consultant has determined that residents and park users would not be able to smell odour from the facility except in emergency conditions (such as earthquakes). Further modelling will be performed for Location Option 3 during the detailed design phase. Proper design of the vent stack will ensure sufficient air dispersion can be achieved to eliminate odour concern.

Some residents also expressed concerns regarding other gases and pathogens escaping from the facility. A list of gas concentrations (pre and post-treatment) is provided in Appendix 8 - Air Quality and Odour Thresholds. Metro Vancouver's findings did not alleviate resident concerns; therefore Metro Vancouver sought a second opinion from Vancouver Coastal Health. Vancouver Coastal Health reviewed the facility design and concluded the project will have no adverse health impacts, would improve air quality and would significantly reduce existing public exposure to odours from the sewer. A letter from Vancouver Coastal Health is included in Appendix 9 - Stakeholder Letters.

Additional issues that were raised during the consultation process are summarized in Appendix 10 - Other Key Issues - Summary Table.

Alignment with Park Board Strategic Framework

The Highbury Interceptor Air Management Facility aligns with the four directions and nine goals as identified in the Vancouver Park Board's Strategic Framework. These are summarized in Table 1 below.

Table 1 - Linkages - Air Management Facility and Park Board Strategic Framework

Direction	Goal	Action
Parks and Recreation for All	1) Great Experience	Provide washroom for sports field users, improve air quality
	2) Relevant Programs and Services	
Leader in Greening	3) Green Operations	Removal of invasive species, new landscaping and tree planting to promote park biodiversity, permeable access surfaces, high fly ash concrete, potential use of natural and recyclable materials, carbon filter is a renewable resource
	4) Healthy Ecosystems	
Engaging People	5) Partners	Metro Vancouver and Vancouver Park Board partnership in planning, design, construction and maintenance of the facility
	6) Employees	
	7) Community	Extensive community outreach, including active community participation, communication and engagement
Excellence in Resource Management	8) Fiscally Resourceful	Dual purpose facility (odour removal and park washroom)

	9) Well Managed Infrastructure	Sustainable design with low flush toilets, high efficiency lighting, natural lighting, motion sensitive exterior lighting, and easily accessible amenities for maintenance
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Schedule

Granted approval, Metro Vancouver will begin detailed design of the facility as soon as possible. Detailed design will include additional input from Vancouver Park Board staff, Musqueam Indian Band, the public and stakeholders including sports field users. Detailed design will take a minimum of eight months and be completed in the fall of 2015, with construction to subsequent. The aim is to have the facility constructed and commissioned for the fall of 2016.

SUMMARY

The Highbury Interceptor Air Management Facility is critical regional infrastructure that will significantly reduce odour and corrosion along the interceptor. Technical constraints are such that Musqueam Park is the most feasible location for the facility. Metro Vancouver will give the Park Board and community added value with this initiative through the provision of a public washroom in the facility, the removal of invasive species, and the enhancement of the urban forest through habitat and tree planting improvements.

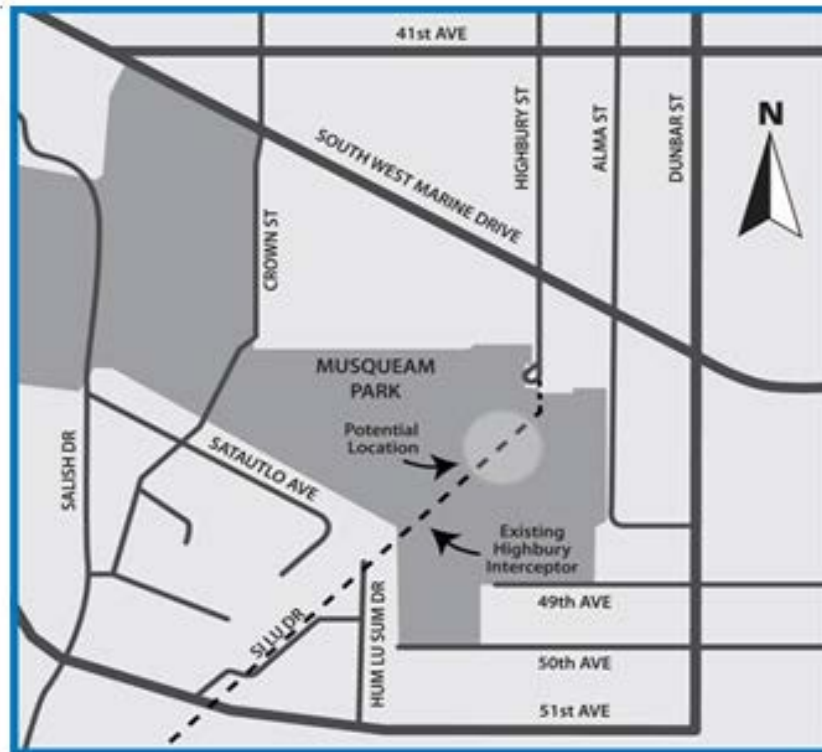
In evaluation of the three options, Option 3 is recommended and will include a front door orientation facing east to the playfields with close proximity to the interceptor. The facility will be sited immediately within the forest edge and have a traditional architectural design and enhanced landscaping as determined through ongoing collaboration with Park Board staff. The anticipated completion date is fall 2016.

General Manager's Office
Vancouver Board of Parks and Recreation
Vancouver, BC

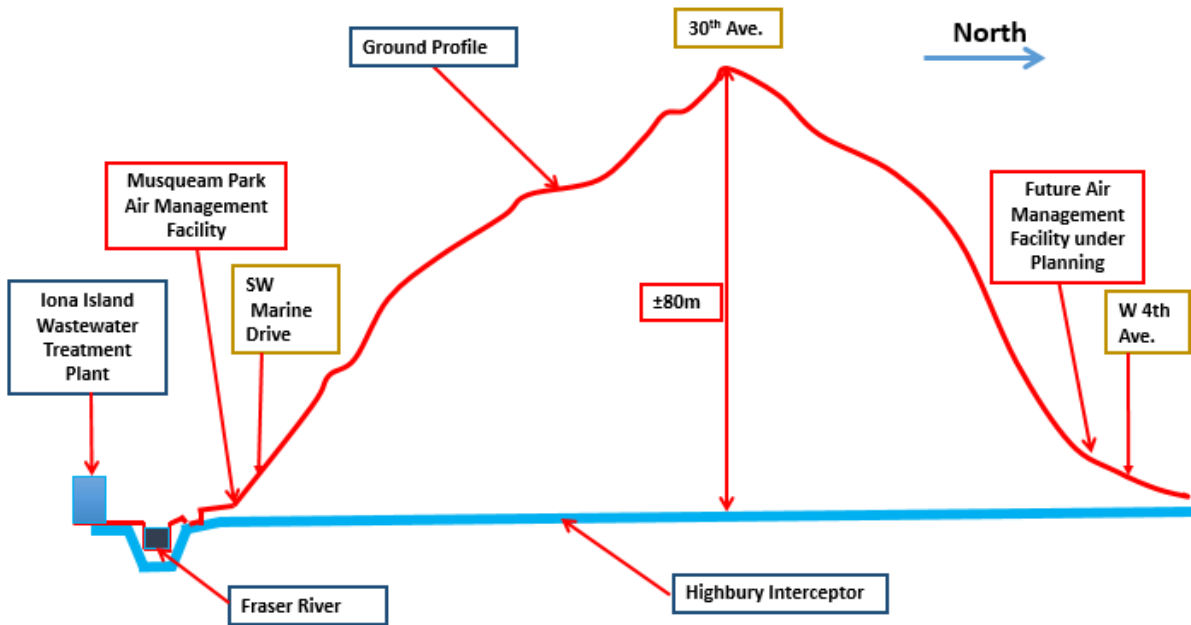
Prepared by:
J. McLeod, Landscape Architect Project Manager,
T. Mack, Manager, Park Development, and
B. Cheng, Senior Engineer, Project Delivery, Metro Vancouver

JM/TM/BC

Appendix- Highbury Interceptor Location



Appendix 1 - Section through Vancouver at Highbury Street



Appendix 2 - Stakeholders

These groups were identified through discussions with Vancouver Park Board staff, internet searches for community organizations, and requests to stakeholders to identify other potential stakeholders that they are aware of. All stakeholder groups were contacted, informed about the project, and invited to attend meetings and encouraged to provide comment.

Community Groups and Residents

- Dunbar Residents Association
- Dunbar Community Centre
- Friends of Southlands
- Kerrisdale Community Policing Centre
- Southlands Community Association
- Southlands Elementary School
- West Southlands Ratepayers' Association

Environmental/naturalist groups

- Fraser River Coalition

Local Businesses

- Dunbar Business Association

Sports Field User Groups

- Consulting Engineers Soccer
- Fusion Football Club
- Marpole Soccer Club
- Old Timers Soccer
- Southlands Equestrian Society
- Southlands Riding Club
- Vancouver Field Sport Federation
- Vancouver Ultimate League
- Vancouver Federation of Sports Fields
- Vancouver Football Club
- Vancouver United Football Club
- Vancouver Youth Soccer Association

Through a designated staff member, Musqueam Indian Band members were also invited to participate in public meetings and through the online survey.

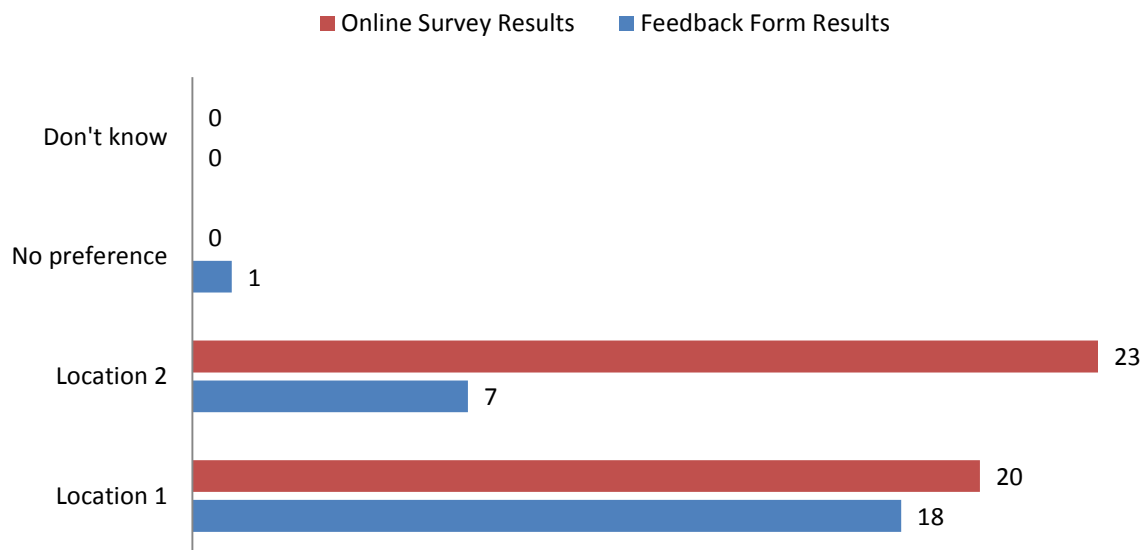
Appendix 3 - Public Meetings & Events

This table summarizes key information regarding the public meetings and events held throughout the stakeholder engagement and consultation process so far.

Event or Meeting	Date	Location	Attendees	Written Responses
Open House #1	Oct. 24, 13	Marineview Chapel	26	Forms- 6
Meeting with Metro Vancouver, Vancouver Park Board staff, West Southlands Ratepayers' Association Directors and residents	Dec. 11, 13	On-site at Musqueam Park	13	n/a
Meeting with Metro Vancouver, West Southlands Ratepayers' Association Chair and residents	Jan. 18, 14	On-site at Musqueam Park	6	n/a
Sports field users of Musqueam Park, Metro Vancouver and Vancouver Park Board staff	Apr. 23, 14	Southlands Elementary School	6	n/a
Planning meeting with West Southlands Ratepayers' Association, residents, Metro Vancouver and Vancouver Park Board	Apr. 24, 14	Kerrisdale Community Centre	14	n/a
Vancouver Park Board staff with Commissioner John C. Coupar, Metro Vancouver staff, West Southlands Ratepayers and residents	Jun. 16, 14	On-site at Musqueam Park	10	n/a
Open House & Online Survey #2	Jun. 25, 14	Musqueam Recreation Centre	46	Forms- 26 Survey- 43

Appendix 4 - Location Preference - Feedback Form and Survey Results

Location Preference Summary



Feedback forms completed at the open house indicated more than a 2:1 preference for Location Option 1. Many attendees at the open house stated that they would respond online rather than through the feedback form.

Online survey results showed an almost even ratio, with a difference of three responses (7%) in favour of Location Option 2 over Location Option 1.

The net result, when adding the online survey results and feedback forms, is that 55% of respondents indicated a preference for Location Option 1.

Several residents contacted Metro Vancouver after the results were shared with the public to state that they felt the online survey results were not valid as it would be possible for the same person to complete the survey multiple times. This is possible in most online surveys. Resident preference is one of many criteria being used to evaluate the location options and should be considered as such.

Appendix 5 - Design and Landscape Options

TRADITIONAL



CONTEMPORARY



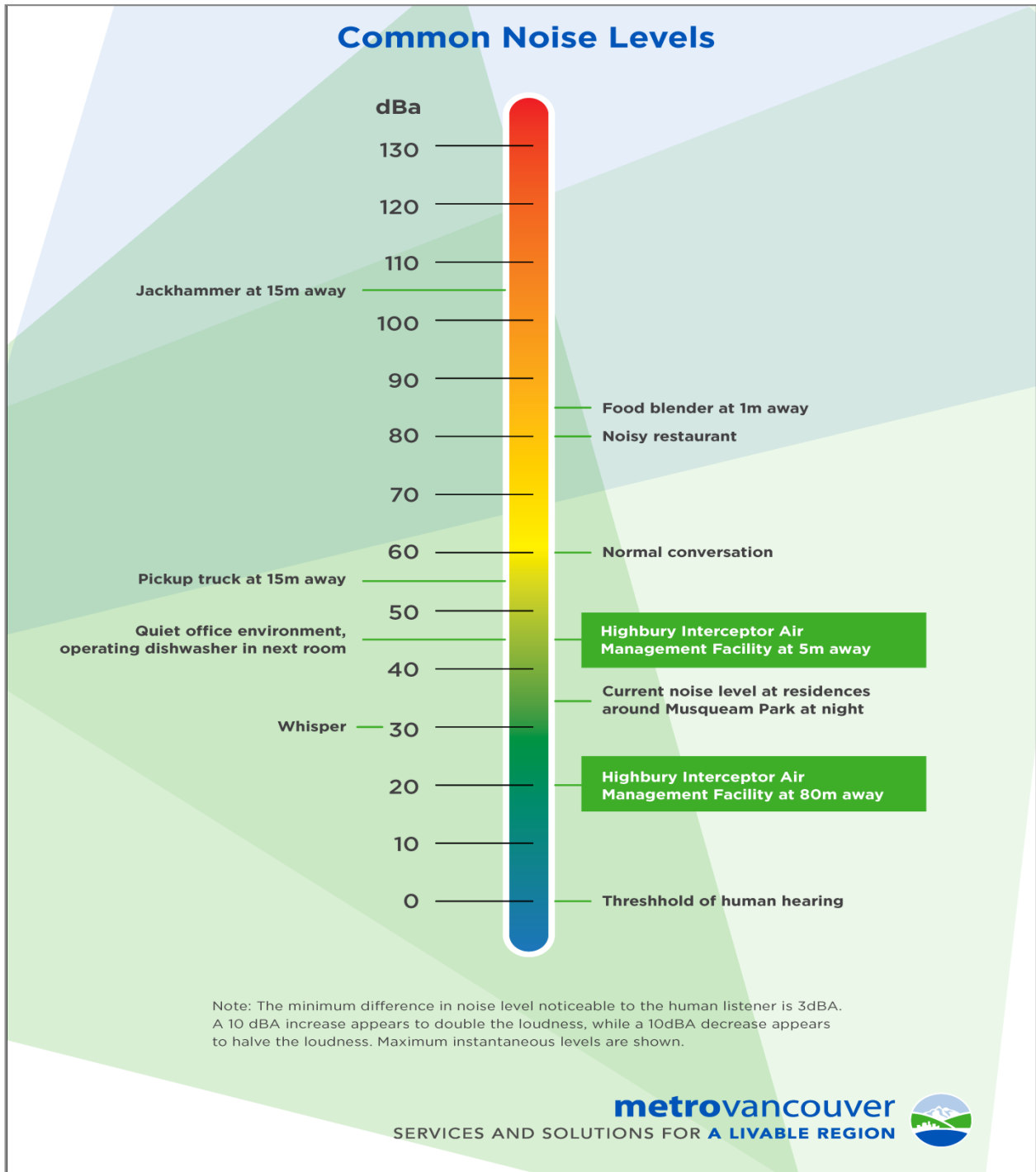
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Appendix 6 - Noise Level Comparison



Appendix 7 - Air Quality and Odour Thresholds

As part of the design of the Highbury Interceptor Air Management Facility at Musqueam Park, Metro Vancouver identified and measured the major gases in the sewer system. All testing and modelling indicates that there will be no odour or health impacts from this facility for residents or park users.

The gases were measured during the hottest and driest month of the year, which is when these gases build up to their highest levels in the Highbury Interceptor. Samples were analysed by an accredited laboratory for 139 compounds. Of these, only seven were found to be present in the Highbury Interceptor. Results are summarized in Table 1 below.

The treatment process at the facility will remove 99.5% of each of these gases. The remaining 0.5% will be dispersed through a vent stack, mixing with the surrounding air and diluting the gases that remain after treatment by a further 98%. The combined effect of treatment and dispersion is that only one 10,000th (0.01%) of the gases in the sewer would be reaching park users standing near the facility.

As part of the facility design, the results were compared with odour detection and health impact thresholds. The results were reviewed by staff in Metro Vancouver's Environmental Regulations and Enforcement Division and by Vancouver Coastal Health.

With respect to odour, the comparison shows that the highest concentrations of the treated and dispersed odorous compounds released from the facility are well below the threshold for humans to smell odours from the facility.

With respect to health, the health threshold values are all significantly higher than the odour threshold values, meaning that detection of the odour occurs long before concentrations are built up enough to cause health concerns. The concentration of these gases after treatment and dispersion ranges from 1/1,000th to 1/100,000,000th (0.1% to 0.000001%) of the threshold values for health impacts.

Upon completion, the air management facility will be tested to ensure it performs as intended. Continuous monitoring of treated sewer gas emission will be in place during operations.

Table 1 - Comparison of Sewer Gases to Odour and Health Thresholds

Gas Compound	Gas Concentrations in the Sewer System*	Gas Concentrations After Treatment (99.5% removal)	Gas Concentrations After Dispersion (Approx. 98% dispersion)	Odour Threshold**	Health Threshold***	Will gas exceed odour or health impacts?
Hydrogen Sulphide	10,000	50	0.865	1	1,000	No
Dimethyl Sulphide	74	0.37	0.007	9.8	10,000	No
Dimethyl Disulphide	50	0.25	0.005	0.78	500	No
Carbon Disulphide	30	0.15	0.003	16	10,000	No
Carbonyl Sulphide	41	0.21	0.004	55	5,000	No
Methyl Mercaptan	51	0.26	0.005	0.54	500	No
Acetaldehyde	26	0.13	0.002	67	100,000	No

Note: All measurements in Parts Per Billion (ppb)

*Highest observed concentration, measured during peak periods

** Odour thresholds for chemicals developed by American Industrial Hygiene Association (AIHA)

*** Health threshold limit values developed by American Conference of Governmental Industrial Hygienists (ACGIH)

Appendix 8 - Letters

1. Vancouver Coastal Health



Office of the Chief
Medical Health Officer

#800 - 601 West Broadway
Vancouver, BC V5Z 4C2

June 18, 2014

Mr. Bob Cheng,
Senior Engineer, Collection Systems
Project Delivery Division
Liquid Waste Services
Metro Vancouver,
4330 Kingsway,
Burnaby, BC, V5H 4G8

Dear Mr. Cheng,

Re: Highbury Interceptor Air Management Facility

Thank you for the opportunity to review the proposed plan for the Highbury Interceptor Air Management Facility (HIAMF).

In assessing the health effects of the proposed project, our staff have reviewed the documents provided to us by Metro Vancouver on the project, including current challenges with odor from the Highbury trunk sewer line, odor control technology options, and air quality dispersion modeling results for the selected option. A site visit to the proposed location was also done.

We conclude that with a routine maintenance plan in place, the HIAMF project will not create adverse human health effects. The facility, once operational, should improve the air quality for the residents, visitors and workers on the Musqueam Indian Reserve.

Vancouver Coastal Health supports this project and agrees with Metro Vancouver that the proposed Air Management Facility will significantly reduce present public exposure to odors from the Highbury trunk sewer line.

Yours sincerely,

A handwritten signature in blue ink, appearing to read 'Patricia Daly', is written over the 'Yours sincerely,' text.

Patricia Daly MD, FRCPC
Vice-President, Public Health and Chief Medical Health Officer
Vancouver Coastal Health

Promoting wellness. Ensuring care. Vancouver Coastal Health Authority

2. City of Vancouver



ENGINEERING SERVICES
Peter Judd, P.Eng., General Manager

August 13, 2014

Mr. Bob Cheng
Senior Engineer, Collection Systems
Project Delivery Division
Liquid Waste Services - Metro Vancouver
4330 Kingsway,
Burnaby, B.C. V5H 4G8

Dear Mr. Cheng:

RE: HIGHBURY INTERCEPTOR AIR MANAGEMENT FACILITY

Thank you for the opportunity to review the proposed plan for the Highbury Interceptor Air Management Facility (HIAMF).

In assessing the overall impacts of the proposed project, our staff have reviewed the documents provided to us by Metro Vancouver on the project, including site evaluation, facility location, odor challenges from the Highbury trunk sewer line, odor control technology options, and air quality dispersion modeling results of the selected option.

We are of the opinion that, with the site planning that has taken place and with a routine maintenance plan in place, the HIAMF project will be very beneficial in mitigating the chronic odor issues along the Highbury Interceptor. The facility, once operational, should also improve the air quality for the residents and visitors to the Musqueam Indian Reserve.

In summary, the City of Vancouver Engineering Department supports this project and agrees with Metro Vancouver that the proposed Air Management Facility will significantly reduce the public exposure and resulting complaints due to odors from the Highbury trunk sewer line.

Yours sincerely,

Brian Crowe, P.Eng.,
Director
Water, Sewer and District Energy.

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City of Vancouver, Engineering Services
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Vancouver, British Columbia V5Z 0B4 Canada
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WATER SERVICES	
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AUG 18 2014

WATER SERVICES



3. Musqueam Indian Band



MUSQUEAM INDIAN BAND

6735 SALISH DRIVE
VANCOUVER, B.C.
CANADA V6N 4C4
TELEPHONE: 604 263-3261
FAX: 604 263-4212

August 25, 2014

Aaron Jasper
Chair
Vancouver Parks Board
City of Vancouver
453 W 12th Ave
Vancouver, BC V5Y 1V4

Dear Mr. Jasper,

This letter is to offer the support of the Musqueam Indian Band for the work being undertaken by Metro Vancouver to put in an air management facility in Musqueam Park in September 2014. The issues of odour from the Highbury Interceptor negatively impacting the Musqueam Indian Band Reserve #2 have been a contentious issue for a number of decades. The work being proposed by Metro Vancouver aims to correct this problem and therefore the Musqueam Indian Band is fully in support of the initiative. Metro's odour control facility will help to address Musqueam's long standing concerns with odour and other negative impacts in the Community from the Highbury Interceptor. For many years, the Band has been urging Metro Vancouver to take action. The Musqueam Indian Band is therefore pleased to see the project moving ahead and look forward to seeing the plan benefits.

Yours truly,



Douglas D. Raines
CAO
Musqueam Indian Band

Cc. Bob Cheng, Lead Senior Engineer, Metro Vancouver

4. West Southlands Ratepayers' Association Letter and Metro Vancouver's Response



25 August 2014

Metro Vancouver
Public Involvement Division
Liquid Waste and Water Services Department
4330 Kingsway, Burnaby, BC
V5H 4G8

To Whom it May Concern:

I am writing on behalf of the West Southlands Ratepayers' Association, a community residing below S.W. Marine Drive, bordered by Collingwood, Crown Street and the West Pt. Grey Golf course, to express appreciation for the information and feedback provided at Metro Vancouver's Open House on June 25 regarding the Highbury Interceptor Air Management Facility proposed for Musqueam Park.

We were especially appreciative of the inclusion of a second Option for the location of the Interceptor, which would place the Air Management and Washroom Facilities between the playing fields and much further away from any of the surrounding homes. Unlike the first Option, located close to houses and proposed for the middle of the Dog Park with a service road bi-secting the green space, the service road for Option#2 would run along the southern perimeter of the park, well beyond the playing field.

In further discussions with residents (many of whom were unable to attend the meeting because of June holidays), the following concerns and conditions were most frequently mentioned:

1. **Air Quality:** Residents want written assurances from qualified sources, well in advance of approval and construction, that any health and safety impacts on residents and park users caused by the facility and/or by the release of air from the facility will be identified and addressed. Air Quality in the Park must be measured at the site before the facility is in operation to obtain a base line. Air Quality measurements taken within the facility after it is built will not reveal odour impacts on the Park environment.

Acceptable levels of air quality in a public park, including safe levels of Volatile Organic Compounds, should be ascertained from local health authorities, published, and made available to the public. After the Interceptor is built, air quality should be measured in Musqueam Park at regular intervals and made available to the public through the Park Board.

We note that a letter from Vancouver Coastal Health to Metro Vancouver dated 18 June, 2014 (attached), while concluding that "the HIAMF project will not create adverse human health effects" has *only* reviewed documents provided by Metro Vancouver on the project and does not provide any of their own independent data. It also says: "The facility, once operational should improve the air quality for residents, visitors and workers on the Musqueam Indian Reserve." There is no reference to Musqueam Park or to a 'site' visit occurring there.

2. **Monitoring and Remediation:** The site chosen for the Interceptor should be situated in the Park so as to minimize aesthetic and other impacts on the environment, park users, and nearby residents. The facility should be as inconspicuous as possible, and residents should not be able to hear mechanical sounds, such as motors, or smell odours from their properties.

In addition to the stated emergency plans, should there be a malfunction on site, contingency plans *must* be in place to deal efficiently with odour control and noise suppression if acceptable and agreed on limits are exceeded. These plans must be provided for in the project's budget. Residents should not have to resort to public action or legal recourse if official complaints have not been dealt with.

3. **Feedback from the June 25 Open House:** Attendees at the open house were invited to respond both to a feed-back form and to an on-line survey as to which of the two location options they preferred. People could, therefore, vote more than once. Although there was a difference of only 8 votes overall in favour of Option #1, the survey split the neighbourhood, as no one wanted to vote to have their property impacted by being nearer the Odour Scrubbing Facility.

We hope Metro Vancouver will recommend, and Park Board accept, the option that will preserve and protect as much of Musqueam Park's quiet, natural beauty as possible. The Highbury sewer Air Management Facility will be around for a long time and testify to our folly, if we do not act prudently.

Respectfully,


Vivian Bevis, Chair
West Southlands Ratepayers' Association
(604) 263-2995

cc: Vancouver Park Board



Liquid Waste Services Department
Tel. 604-436-6778 Fax 604.432-6297

September 26, 2014

Ms. Vivian Bevis
6242 Alma Street
Vancouver, BC V6N 1Y6

Dear Ms. Bevis:

Re: August 25 Letter from WSRA

Thank you again for your clarifications regarding outstanding concerns from West Southlands Ratepayers Association (WSRA) members. Both your letter and our subsequent phone call were useful in understanding the position of the WSRA. This letter contains the key points from your letter and our responses.

For your reference, we have provided a brief summary of these points as part of a new Frequently Asked Questions document posted on our website.

1. Air Quality

Residents want written assurances from qualified sources that any health and safety impacts... will be identified and addressed

If any health or safety issues arise from the air management facility, Metro Vancouver will identify and address these in a timely manner.

Air quality should be measured in the park before the facility is operational to obtain a baseline. Air quality measurements taken within the facility after it is built will not reveal odour impacts on the Park environment

Placing measurement equipment in the stack would capture readings at the point of highest concentration (before any residual gases are released from the facility) and is the only way to get an accurate measurement of what the facility itself is releasing.

Measuring from outside the facility would not be able to differentiate between odorous compounds from other sources, such as the treatment plant, other vent stacks, leaks in municipal or domestic sewer systems, or other non-sewage sources such as dog waste or compost.

Metro Vancouver can take a reading around the park using its Mobile Air Monitoring Unit (MAMU) to measure hydrogen sulfide levels prior to the construction of the facility. However, as described above, this would also pick up existing compounds that vary independently of the facility.

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Greater Vancouver Regional District • Greater Vancouver Water District • Greater Vancouver Sewerage and Drainage District • Metro Vancouver Housing Corporation

Acceptable levels of air quality in a public park should be determined by local health authorities (including Volatile Organic Compounds, or VOCs) and these levels should be shared publically

Metro Vancouver is the authority that determines the acceptable levels, referred to as “objectives”, for air quality in the region. These levels are available on Metro Vancouver’s website at www.metrovancouver.org/services/air/Documents/AQOFactsheet.pdf and are among the most stringent in the world. However, most of these pollutants result from combustion, which does not occur within the sewer.

As part of the design process for this facility, Metro Vancouver measured the levels of gases in the Highbury Interceptor. This testing was completed during a prolonged warm and dry period, when gas buildup is at its highest in the sewer. The highest recorded levels of these gases were compared to thresholds for both odour and health. As you will see from Attachment 1, after treatment and dispersion (the mixing of treated air with surrounding air) the level of gases released from the facility are below odour detection thresholds, which in turn are far below health impact thresholds.

For your reference, these thresholds were determined through a review of available literature and refined through discussions with our consultant, Metro Vancouver’s air quality division, and Vancouver Coastal Health. Metro Vancouver will place the odour and health thresholds on its website to share these with the public, as per your request.

Regarding your specific question about VOCs, this is a broad category of chemicals, many of which are non-toxic and typically not present in sewers. There is no single air quality objective for VOCs. However, it is illegal to dump VOC-causing materials (such as gasoline or paint) into the sewer in Metro Vancouver. If that ban is violated, VOCs would be scrubbed along with other odorous compounds by the air management facility.

After the Interceptor is built, air quality should be measured in Musqueam Park at regular intervals and made available to the public through the Park Board

Metro Vancouver has committed to include continuous monitoring of gas from the facility and to share these results directly with residents.

We note that the letter from Vancouver Coastal Health... has only reviewed documents provided by Metro Vancouver... and does not provide any of their own independent data... There is no reference to Musqueam Park or to a site visit occurring there

The question posed to Vancouver Coastal Health (VCH) was: will the facility result in negative impacts on human health for park visitors or surrounding residents from either gases or pathogens? The letter answers this question from the perspective of VCH.

The information used to design the facility and conduct modelling is specific to Musqueam Park, including meteorological data and measurements of the peak levels of sewer gas. VCH would request additional data, material, or studies if more information were required for form an opinion.

VCH did conduct a site visit to Musqueam Park as described in their letter.

2. Contingency Plans for Odour and Noise Issues (referred to as Monitoring and Remediation in your letter)

In addition to the stated emergency response plans, should there be a non-emergency malfunction, contingency plans must be in place to deal efficiently with odour control and noise

Non-emergency issues are still a priority for Metro Vancouver. In the event that odour or noise complaints are received from residents or park users, a staff member would be dispatched within 24 hours to check that the facility is working correctly. The facility may be shut down during repairs if there is an issue impacting residents. For minor issues, many of these can be fixed within one or two business days. For major issues, depending on the nature of the problem, this generally takes one to two weeks as additional staff and resources need to be allocated. Metro Vancouver will strive to address any potential issues as soon as feasible.

Contingency plans should be provided for in the project's budget

Contingency funding is built into all of Metro Vancouver's projects and is available for non-emergency issues, including odour and noise. This contingency may be used to address any deficiencies that occur during construction, testing, and commissioning. Additional funding can be made available if the facility is not performing to its design specifications and significant changes are required.

After commissioning is complete, Metro Vancouver has significant operating funds available to effect repairs and address issues, including odour and noise issues.

3. Feedback from the June 25 Open House and Online Survey

In our understanding, your concern is that a relatively small difference in the number of residents expressing preference for one option over another will change the outcome of the decision regarding Location Options.

To clarify, this is not the case. First, resident preference is considered as one of many aspects of public input that inform the decision.

Second, part of the purpose is to draw out specific commentary on *why* one option was preferred over another.

As you have seen from the meeting summary, resident opinion on location options is clearly divided almost evenly between the two location options. The decision will therefore be made based on other criteria, such as impact to park user groups, technical effectiveness and cost, and impact on the natural environment, as described on the poster boards presented at the June 25 Open House.

Thank you for your time.

Sincerely,



Jack Chow
Senior Project Engineer
Liquid Waste Services Department
Metro Vancouver
604 436 6778
Jack.Chow@metrovancover.org

JC/PW/st

cc: Bob Cheng, Lead Sr. Engineer, Liquid Waste Services, Metro Vancouver
Andrea Winkler, Acting Program Manager, Public Involvement, Liquid Waste Services, Metro Vancouver
Tiina Mack, Manager of Park Development, Vancouver Board of Parks and Recreation
Joe McLeod, Landscape Architect - Project Manager, Vancouver Board of Parks and Recreation

Attachment 1: Odour and Noise Thresholds

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Attachment 1: Odour and Health Thresholds

As part of the design of the Highbury Interceptor Air Management Facility at Musqueam Park, Metro Vancouver identified and measured the major gases in sewer systems. All testing and modelling indicates that there will be no odour or health impacts from this facility for residents or park users.

The gases were measured during the hottest and driest month of the year, which is when these gases build up to their highest levels in the Highbury Interceptor. Samples were analyzed by an accredited laboratory for 139 compounds. Of these, only seven were found to be present in the Highbury Interceptor. Results are summarized in Table 1 and described below.

The treatment process at the facility will remove 99.5% of each of these gases. The remaining 0.5% will be dispersed through a vent stack, mixing with the surrounding air and diluting the gases that remain after treatment by a further 98%. The combined effect of treatment and dispersion is that only one 10,000th (0.01%) of the gases in the sewer would be reaching park users standing near the facility.

As part of the facility design, the results were compared with odour detection and health impact thresholds. The results were reviewed by staff in Metro Vancouver's Environmental Regulations and Enforcement Division and by Vancouver Coastal Health.

With respect to odour, the comparison shows that the highest concentrations of the treated and dispersed odorous compounds released from the facility are well below the threshold for humans to smell odours from the facility.

With respect to health, the health threshold values are all significantly higher than the odour threshold values, meaning that detection of the odour occurs long before concentrations are built up enough to cause health concerns. The concentration of these gases after treatment and dispersion ranges from 1/1,000th to 1/100,000,000th (0.1% to 0.000001%) of the threshold values for health impacts.

Upon completion, the air management facility will be tested to ensure it performs as intended. Continuous monitoring of treated sewer gas emission will be in place during operations.

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Table 1 - Comparison of Sewer Gases to Odour and Health Thresholds

Gas Compound	Gas Concentrations in the Sewer System*	Gas Concentrations After Treatment (99.5% removal)	Gas Concentrations After Dispersion (98% dispersion)	Odour Threshold** (ppb)	Health Threshold*** (ppb)	Will gas exceed odour or health impacts?
Hydrogen Sulphide	10,000	50	0.865	1	1,000	No
Dimethyl Sulphide	74	0.37	0.007	9.8	10,000	No
Dimethyl Disulphide	50	0.25	0.005	0.78	500	No
Carbon Disulphide	30	0.15	0.003	16	10,000	No
Carbonyl Sulphide	41	0.21	0.004	55	5,000	No
Methyl Mercaptan	51	0.26	0.005	0.54	500	No
Acetaldehyde	26	0.13	0.002	67	100,000	No

Note: All measurements in Parts Per Billion (ppb)

*Highest observed concentration, measured during peak periods

** Odour thresholds for chemicals developed by American Industrial Hygiene Association (AIHA)

*** Health threshold limit values developed by American Conference of Governmental Industrial Hygienists (ACGIH)

5. Sports Field Users

VANCOUVER UNITED FC

Game. Club. Community.

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August 20, 2014

Delivered by Mail

Metro Vancouver
Water and Liquid Waste Services Department
4330 Kingsway
Burnaby, BC V5H 4G8

**Attention: Sean Tynan
Policy Coordinator**

Dear Board and Staff:

Re: Re Highbury Interceptor Air Management Facility

I am a director of and the field coordinator for Vancouver United, Vancouver's largest youth soccer club with approximately 4,000 children as members. We are the only youth soccer club with a presence in the neighbourhoods around Musqueam Field and our teams use the field for much of the year (the field is often closed in the wettest months).

We have been consulted regarding the Highbury Interceptor Air Management Facility. We have noted the care in the initial design to avoid reducing the playable part of the field, we support and applaud this approach. In addition we have noted that an option is on the table to include a washroom in the Facility design. We think this would be a valuable amenity to the public. Our teams would use the proposed washrooms, as would other field users and also recreational users of the park generally.

Thank you for your attention to this issue.

Yours truly,

Vancouver United Football Club

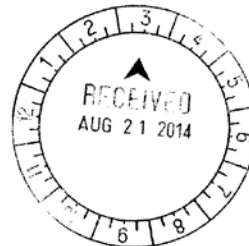


Gordon R. Johnson

GRJ:wd

Lawyers | Patent & Trade-mark Agents

VAN01: 3651927: v1



Appendix 9 - Other Key Issues - Summary Table

Many issues and concerns were raised throughout the engagement and consultation process. Some of the key (recurring) issues and concerns are summarized in the table below along with Metro Vancouver's responses. A more comprehensive list is included in the *Highbury Interceptor Air Management Facility at Musqueam Park: Engagement & Consultation Report*.

Metro Vancouver (MV)
Vancouver Park Board (VPB)

Issue/Concern	Response
Construction Impacts	
Timing of construction and impact of access roads	Construction is expected to begin in early summer 2015. The aim is to have the facility commissioned by the end of 2015. Construction access roads will be temporary. Permanent maintenance access roads will use grasscrete to form a permeable and less visible surface that will blend in with the park environment.
Construction impact on sports fields and parking	Access to the sports field will be maintained during construction with the exception of minor parking restrictions in specific locations. Details of parking restrictions will be finalized once a location in Musqueam Park is selected.
Noise and traffic from construction	Construction noise and traffic will be similar to impact associated with building a residential home.
Odour, Health and Air Quality	
Odour coming from the facility once it is operational	The odour control system will remove 99.5 percent of odorous compounds. The remaining 0.5 percent is released from a tall vent stack, which helps to disperse remaining compounds through mixing with air. MV's consultant modelled the results of the system and compared odour concentrations under different scenarios to stringent standards for odour detection. The results show that residents and park users will not smell odours from the facility at any time.
Health impacts from gasses or pathogens	Metro Vancouver's research did not show any health impacts. A review completed by Vancouver Coastal Health indicates that there will be no adverse health impacts from the facility, which will improve air quality and reduce public health risks in the area.
Previous odour complaints	Odour complaints have occurred along the entire interceptor. Although formal records were not kept, MV has spoken with staff that work in Musqueam Park and identified the locations where odour complaints were addressed. Members of the public attending meetings have confirmed odour issues at 33 rd Avenue and across the Musqueam Indian Band reserve.

Noise	
Noise coming from the facility once it is operational	<p>The facility is designed to meet City of Vancouver night time noise bylaw requirements of 45 dBA within five metres of the facility. Sound decreases as a function of distance. At 80 metres (the closest property line to Location Option 1) noise from the facility has dropped well below the quietest night time noise levels and as such should not be audible to residents. So, noise will not be an issue with Location Option 3 which is farther from residences than Location Option 1.</p> <p>One potential exception is when the valves within the air management facility shut down during a power outage. The noise would last no more than a few seconds as the system responds to an emergency shut-down command. MV is exploring options to reduce noise even under this circumstance to a level that would not disturb residents and this will be a goal for the detailed design of the facility.</p>
Facility Design & Security	
Necessity of a washroom	The Vancouver Park Board (VPB) has identified a need for a universally accessible washroom in Musqueam Park. The Park Board will ensure that the washroom will be safely accessible especially for sports users and visible from the fields and street.
Safety and security concerns related to public access to toilets	Initial discussions with VPB staff suggest that the washroom will have key-based access for field users. Vancouver Park Board will work with residents and park users to determine the best approach to washroom access.
Vandalism	The facility will be designed with anti-graffiti materials and will consider the potential for vandalism. Landscaping against the building may also reduce opportunities for graffiti.
Facility Location	
Locating the facility in Musqueam Park	MV and its consultants have carefully considered potential locations for the air management facilities. From a technical perspective, the facility cannot be located north of Musqueam Park as the Highbury Interceptor is too far below ground. The facility cannot be located south of the park as the sewer is lower and impacted by the sewage level at the treatment plant across the Fraser River. Locating the facility in the park will maximize air extraction. Placing the air management facility in Musqueam Park provides a buffer from nearby residences, helping to minimize potential impacts on the community.

Technical Aspects	
Effectiveness of the carbon scrubbing technology chosen	This technology was selected based on a combination of effectiveness and reliability. The technology is proven, and has been successfully adopted at air management facilities in park settings or close proximity to residences around the world. Examples in Canada include Ottawa and Toronto.
Necessity of the facility	Odour complaints related to the Highbury Interceptor have increased in recent years. Historically, the response to odour issues has been to seal the sewers to prevent odours from escaping. To properly address the odour issues, Metro Vancouver, like most other jurisdictions with large sewer infrastructure, is starting to vent sewers to allow oxygen back into the system to mitigate these problems.
Other Issues and Concerns	
Flooding of the sports fields	MV is aware of the ground conditions on the sports fields as well as other potential facility locations under consideration, and will design the facility with the ground conditions in mind. Ground investigations will take place to obtain the necessary design parameters.
Impact to wildlife and the natural environment	An arborist's report and a biologist's report have been completed and indicate minimal impact to wildlife and the surrounding environment. Tree survey report indicates that some tree felling will be required to incorporate the facility within the treeline. These trees would include Black Cottonwoods and Red Alders.

Appendix 11 - Aerial Map of Location Options



Appendix 12 - Location Option Comparison Table

CRITERIA	DESCRIPTION	LOCATION OPTION 1	LOCATION OPTION 2	LOCATION OPTION 3	COMMENTS
Temporary Parking Access Impacts	There will be some parking and vehicle access restrictions around the park during construction	Parking restrictions along W.46th Ave. & restricted access to Highbury St. cul-de-sac	Parking restrictions along Alma St.	Parking restrictions along W.46th Ave. & restricted access to Highbury St. cul-de-sac	In all options, residents should not experience any restriction in access to and from their homes
Temporary Park Access Impacts	There will be some temporary impacts to park users during construction	During access road construction, park users will not be able to walk across the access road	Closure of one of the sports fields for much of spring/summer in 2015	During access road construction, park users will not be able to walk across the access road	
Impacts to Open Space in Park	Residents have identified the preservation of open space as a concern	Reduces green space in the off-leash dog area of the park by 260 square metres	Reduces green space Between the sport fields by approximately 260 square metres, though some of this area is taken up by saplings that would be moved	The building will not reduce open green space in the park	Option 3 has the least impact on open green space in the park
Washroom Location	The washroom is intended primarily for sport field users and it is preferable that it be close by to the fields	Washroom is near one sports field; users of the other field would need to walk approximately 100 metres to access the	Washroom is between the two sports fields	Washroom is near one sports field; users of the other field would need to walk approximately 100 metres to access the	In all cases the washroom facilities should be accessible to sport field users

		washroom		washroom	
Drainage impacts	Some areas of the field tend to receive pools of water during parts of the year	Likely improve drainage around the building and along access road	Likely no change to drainage in the park	Likely improvements to drainage along access road	
Proximity to Residential Areas	More distance from residential areas can help to minimize potential noise and visual impacts	Nearest residence approximately 80 metres away	Nearest residence approximately 140 metres away	Nearest residence approximately 140 metres away	No option should have any noise impacts on residential properties
Visual Impact	Minimizing the visibility of the facility will help it to blend with the park environment	Facility visible from Highbury St. and W.46th Ave., generally not visible from other residences	Facility partially visible from Highbury St. and Alma St. as well as Highbury St. and W. 46th Ave.	Least visible from nearby residences; distance, tree screening and shade help to reduce visibility	Option 3 will be the least visible from the nearest residences
Trees and Wildlife	The impact of the facility on trees	No impact on trees	Requires transplanting some saplings	Tree removal required - only some of the trees will be replaced	No option is expected to have significant impacts on wildlife
Invasive Species Control	Removal of invasive species and replanting with native species		Removal of invasive species at south end of the sports fields	Removal of invasive species (blackberry bushes) on the west side of the sports field where the facility is located	Metro Vancouver would provide invasive species removal regardless of which location option is chosen

<p>Technical Effectiveness of the Facility</p>	<p>The proximity to the Highbury Interceptor line influences how effectively air can be extracted for treatment</p>	<ul style="list-style-type: none"> • Approximately 7 metres from the interceptor line • Being close to the sewer allows more effective air extraction 	<ul style="list-style-type: none"> • Approximately 70 metres from the interceptor line • The distance may pose challenges to air extraction including the need for more piping and the use of more energy 	<ul style="list-style-type: none"> • Approximately 5 metres from the interceptor line • Being close to the sewer allows more effective air extraction 	<p>Some increase in technical effectiveness for Location Option 1 and 3</p>
<p>Construction Cost</p>	<p>The costs associated with building the facility include construction of the facility itself and associated access roads</p>	<p>Relatively lower cost due to less piping and smaller extraction fans</p>	<p>Relatively higher cost, estimated at 10% of \$6M project, due to more piping, larger extraction fans and electrical work on the east side of the interceptor</p>	<p>Moderate cost, likely halfway between two options, in part due to the cost of tree removal and drainage works</p>	