

## **REPORT OF THE WEST SIDE TECHNICAL COMMITTEE**

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Respectfully submitted to the West Side SELECT Committee, April 21, 2015

### **BACKGROUND:**

With the establishment of – and through the authority of - the West Side Select Committee, a sub-committee, the Westside Technical Committee (WTC) was created to pursue a high-level evaluation of available information to determine *potential* wastewater treatment locations within the West Side communities.

The WTC established five Tasks. These tasks resulted in the preparation of this high level report provide the Westside Select Committee with a reasonable selection of potential Westside wastewater treatment and resource recovery sites for further public discussion and technical.

In order to meet the accelerated time lines established, the following five Tasks were undertaken in conjunction with each other.

### **TASKS:**

1. Participation in a ‘Open House’ program
  - a. This Task involved the WTC working with the communications group preparing, conducting, facilitating and reviewing responses to the five Open Houses (i.e. Songhees First Nation; Colwood; Langford; Esquimalt; View Royal) conducted in January/February 2015; and
  - b. The public engagement program has two initial phases:
    - i. The first was the collection of input from residents (discussions/surveys) to determine what parameters were considered important if a waste water treatment and resource recovery plant eventually was to be located in their neighbourhood; and
    - ii. The second phase will consist of citizen round tables where residents again will be consulted on the results of this report on possible treatment locations, the potential for resource recovery and the technical information on possible treatment systems provided through the Request for Technical Information in Task 2 below.
2. Carry out a Request for Technical Information (RFTI) from the wastewater industry
  - a. This task involved the WTC sending out an RFTI and reviewing the submissions, with a view to a high level appreciation of current technologies that may be suitable for one or more sites which would help with site selection

3. Develop a West Side map of potential locations for waste water treatment and resource recovery (attached). This analysis was based on a high level review of the following information:
  - a. sites identified by CRD staff prior to Discussion Paper 036-DP-2;
  - b. resource recovery potential and District Energy System (DES) potential as identified by CRD staff prior to the same paper;
  - c. multiple sites further defined by the CRD and its consultants in 036-DP-2;
  - d. potential locations based on individual West Side municipalities' input;
  - e. potential resource recovery and DES opportunities for these additional sites;
  - f. initial results from ongoing Colwood technical studies on alternative disposal options for treated waste water.
4. Review of Established Allocated Waste Water Flows for each Westside municipality and the Songhees First Nation:
  - a. The WTC with assistance from the CRD reviewed the established allocated flows that will require treatment.
5. High Level Analysis/Evaluation of the information obtained from the above four Tasks:
  - a. An evaluation of the potential sites was undertaken by the WTC (appendix attached).

The WTC has a working knowledge of the layout/organization of the existing CRD trunk sewer and collection system. Based on this knowledge, and until directed differently, the WTC considers that the flows that are expected to be treated within the West Side municipalities will include the relevant flows from Saanich and Vic West.

### *Discussion of above Tasks:*

#### **Task 1... Participation in a 'Open House' program**

Members of the WTC attended the open houses in each municipality. The participants often had interesting questions for the members and a significant number knew very little about the review process or sewage treatment before attending the open house. By engaging in one on one conversation, the WTC members were able to provide useful information to individuals and small groups. These conversations also gave the WTC members an insight to participant concerns. As well, a number of the suppliers attended and engaged in higher level technical conversations with the WTC.

The following commentary on the results of the Open House attendees who chose to respond to the survey recognizes that this survey is not a statistically valid survey of the population of any identifiable group of residents of the area, and provides only an indication of interests from the group of respondents. The select committee may wish to consider using a random survey of the residents of the subject area at some point in the process.

Approximately 60% of the population in the four municipalities of the Westside live in residences connected to sewers whereas about 80% of the survey respondents are connected to the sewers.

Respondents were asked to rank the following: “Meet high environmental standards”, “Keep costs low” and “Build potential for resource recovery”.

	<b>1</b>	<b>2</b>	<b>3</b>	<b>Average Rating</b>
Meet high environment standards	146 (45.77%)	94 (29.47%)	73 (22.88%)	1.77
Keep costs low	103 (32.29%)	75 (23.51%)	131 (41.07%)	2.09
Build potential for resource recovery e.g. affordable energy and reclaimed water	66 (20.69%)	142 (44.51%)	101 (31.66%)	2.11

Another way to analyse the results would be to assign 3 points for a top ranking, 2 points for a second ranking and 1 point for a third ranking then the environmental standards gets a total of 700 points, low costs gets about 600 and resource recovery gets 500. The results show a significant concern for high environmental standards by respondents but sometimes concern for the environment tends to fall off rapidly if the costs become too high. The relationship between costs and standards would be better explored at the Round Table phase of the public engagement process.

All of the items in the ‘important features’ section of the questionnaire that relate directly to harm to the environment were ranked very low for instance “Removal of harmful materials” was ranked right at the bottom. On the other hand “No odour” and “Hidden from sight” were ranked right at the top. This may suggest that in the previous answer when respondents ranked “Meet high environmental standards” as a priority, they may be equating that to the level of odour, visual intrusion etc. in their neighbourhood rather than effects on the general environment. In this section “Minimize cost to the taxpayer” was ranked equal to odour and noise at the top. Site-specific issues and cost appear to be highest priority to the respondents.

The following is the slide from the Communications Group on the Handling of Treated Water:

	<b>Support</b>	<b>Not support</b>	<b>Unsure</b>
Dispose treated water through an ocean outfall	176	74	47
Dispose treated water into the ground (where ground is suitable and Ministry approves)	125	83	85

Dispose treated water into freshwater lakes and streams	52	171	69
Reuse treated water for toilet flushing and other low contact uses	224	36	42
Reuse treated water for irrigation	252	21	32

The respondents indicated a preference for reuse of treated wastewater either for in house use or for irrigation followed by disposal of the balance of the treated wastewater to oceans and ground. There was little support for disposal of treated wastewater to rivers and streams.

The following is the slide from the Communications Group on the Handling of Treated Solids:

	<b>Support</b>	<b>Not support</b>	<b>Unsure</b>
Build a sewage treatment facility that will also process the solids	262	21	25
Construct a pipe to send solids to another location	64	166	70
Transport dried solids to another location by truck, train, boat or other method	63	167	65
Compost solids into nutrient rich product for use or sale	204	56	45
Dry solids into pellets or products that can be used or sold as fuel	216	33	53
Process solids through gasification or other methods	168	41	90

Here there are some very clear messages. These numbers show a very significant preference for the biosolids from sewage treatment to be treated on site and to be turned into something useful. Even gasification of the solids received almost three times the support compared with sending biosolids offsite by pipe.

The technical committee responded to the information extracted from the survey by:

1. Identifying sites that are large enough to consider on-site processing of biosolids; and

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2. Identifying uses and markets for the processed solids that are practical in the area with minimal transportation of solids; and
  3. Considering options to maximise the reuse of treated water and minimize its cost; and
  4. Factoring into any design features that result in as little nuisance to the neighbourhood as possible.

## Task 2... Carry out a Request for Technical Information (RFTI) from the wastewater industry

Responses to the Request for Technical Information (RFTI) were received from late January through most of February, 2015. The WTC received about 10 submissions, with several of these submissions containing numerous associated suppliers' brochures embedded within. These submissions were all from companies intensively engaged with the Wastewater and resource recovery technology, most with significant experience in the field.

It should be noted that a number of manufacturers of wastewater treatment equipment, consultants and constructors did not respond to the RFTI. Therefore the responses provide only a sample of available equipment and services although one large firm did submit a comprehensive review of available technologies. Accordingly, the submissions received are considered to be just the 'tip of the iceberg' of proven, available wastewater technologies.

It was gratifying to note that most submissions made an attempt to answer the stated questions from the RFTI, with varying degrees of completeness. In particular, the topics of site area and overall plant costs were covered in a somewhat general way, mostly due to a lack of actual design-related information in the RFTI. A few submissions which provided more specific sub-components of a wastewater treatment system, e.g. primary treatment modalities such as screening and clarifiers, were more specific respecting probable costs and space considerations,.

However, overall treatment plant costs, along with definitive site area requirements and discharge of treated effluent, could clearly not be determined from this RFTI process. The main intent of the RFTI to obtain a better understanding of some of the alternate technologies available in the current wastewater marketplace, together with a reasonable expectation of 'probable' land requirements for the spectrum of technologies available.

Given the substantial broadening of the field of available and tested technologies especially in the last ten years, it is not considered necessary or advisable to choose a particular technology for treatment before going to an RFP. Such a robust RFP process will ensure that only technologies suitable for the available sites and that will provide the public, the CRD and the municipalities with everything they legally require and as much as possible of what they want within the budget for the project and according to the priorities that will be established through this process.

## Task 3... Develop a West Side map of potential locations for waste water treatment (attached)

Fundamental to this Report was the development of a West Side area map showing the location of the various properties that the WTC, in consultation with the West Side municipalities and Songhees First Nation, reasonably considered to have the potential for locating one or more wastewater treatment facilities. This site selection process is very different from previous processes in that it is carried out initially by staff members from the individual municipalities who bring a great deal of knowledge about the sites that was missing from previous assessments. However, as detailed in the Background section of this report and below, this process included the work done previously.

This map (attached) evolved through a reconciliation of information gathered through four general stages:

1. CRD staff possessed a 'concept-only' Core area map showing areas of initial interest for potential wastewater facilities; this 'concept-only' map also showed potential areas of interest for possible heat recovery for public buildings (or possibly a district-energy-system) from both sewer trunk lines and water supply mains;
2. This 'concept-only' map was then overlaid onto another map showing the ten locations reflected in the detailed analysis of 36-DP-2 (March 2009);
3. After deleting unreasonable (and East Side) sites from A & B above, the WTC then pursued a high-level review of all the properties within the West Side municipalities with a view to isolating additional sites that, demonstrated a reasonable potential to accommodate a wastewater treatment plant; note that Map sites #4, 5, 14 and 16.were sites previously considered by CRD forces in A and B above;
4. Evaluation of A through C above, with supporting analysis (See Task 5);

#### Task 4... Review of Established Waste Water Flows

Through CALWMP, the CRD and municipalities reviewed current and expected future flows expected in the wastewater collection and treatment system. The process entailed the CRD generating flow values for Average Dry Weather Flow (ADWF) and Average Annual Flow (AAF) based on monitored flows within the collection system and applying best estimates of projections for population and commercial growth rates (note that there were problems with these calculations, e.g., Langford and Colwood rates were assumed to be the same when in fact one is more than twice the other). This information was then forwarded to the municipalities for confirmation. Based on these two reviews, flow rates were established for each municipality. The flow rates were also adjusted in order to meet the projected capacity (108 ML per day) of a proposed centralized plant at McLoughlin Point. These flow rates were also used in the drafting of the 2010 Cost Allocation Bylaw where the cost of capital construction of the CALWMP was allocated to each municipality.

With the creation of Westside Solutions and its east side counterpart, there is an opportunity to review and confirm the individual flows for the Westside municipalities. With the completion of the sewage treatment plant(s) now extended to 2023, the former design horizon of 2030 should be reviewed. However as per capita water usage rates continue to decline and development slows there are reasons

to undertake a more detailed analysis of these targets in the next stage of planning. Therefore Table 1 details the 2010 allocations for the Westside Solutions municipalities.

As can be seen in the attached drawing the North East Trunk also terminates at the same location as the North West Trunk. The North East Trunk carries flows from portions of the District of Saanich, City of Victoria and the Township of Esquimalt. The flows that were generated by Saanich and Victoria were estimated by the Technical Committee in order to carry out sizing of the possible WWTP sites. The flows to Macaulay from Saanich were estimated at 16.5 ML/day and from Victoria at 1 ML/day respectively.

Table 1 shows the revised flows that might be expected for the Westside.

<b>Municipality</b>	<b>Projected Flow Rate – 2030</b>
City of Langford	14.1
City of Colwood	4.7
Town of View Royal	3.5
Esquimalt Nation	0.7
Songhees Nation	0.7
Township of Esquimalt	6.2
District of Saanich (portion flowing to Macaulay only)	16.5
City of Victoria (portion flowing to Macaulay only)	1
<b>Total</b>	<b>47.4</b>

The WTC has used the numbers in table 1 as a maximum size for a potential WWTP or collection of WWTPs.

With possible sites identified, the next sub task was to determine possible flow scenarios for individual and combinations of the Westside municipalities. Seven possible flow scenarios were identified. These scenarios were based on the number of plants to be built and the flows that they would have to deal with. The scenarios are shown in the table in Appendix 1 and in Table 2 below

Table 2

<b>Flow Scenario</b>	<b>Number of Plants</b>	<b>Plant(s) location</b>
A	4	City of Langford City of Colwood Town of View Royal Township of Esquimalt
B	3	City of Colwood/ Town of View Royal Township of Esquimalt
C.1	2	Town of View Royal Township of Esquimalt
C.2	2	City of Colwood Township of Esquimalt
C.3	2	Town of View Royal

		Township of Esquimalt
D.1	1	City of Colwood
D.2	1	Township of Esquimalt

## Task 5... High Level Analysis/Evaluation of the information obtained from the above four Tasks

The selection of possible site locations was based on the local knowledge of the communities by the technical representative and an understanding of each local council's positions and tolerances for accepting in principal possible siting of the WWTP (Wastewater Treatment Plant) within their individual municipalities. Possible site locations were then married with this information as well as the information garnered from the previous four tasks for a high end analysis. The analysis does not delve into the detailed cost implications associated with each of the proposed sites with respect to the possible modifications/additions/abandonment of the portions of the linear collection system. The Committee proposes that these requirements would play a role in the siting of a WWTP(s) in accordance with further analysis and decision making.

Aspects of sites that were considered are:

1. Size – large enough to accommodate the flow for the home municipality and preferably for the other flows likely to be directed there.
2. Proximity to the trunk – closer to the trunk means reduced piping costs and reduced neighbourhood disruption.
3. Proximity to a potential outfall – as in 2 above.
4. Proximity to residential neighbourhoods – further from residences makes public acceptance easier and has little effect on resource recovery opportunities since these are most likely to be economically viable in commercial/industrial areas
5. Proximity to existing and potential public and private sector developments that could be large scale water and energy users – to increase the early opportunities for meaningful use of recovered resources.

Sites that were far from the main trunk and possible outfall locations were eliminated where there were a number of other sites that clearly had the same or better advantages but with none of the disadvantages. Similarly some sites that were so small they severely limited the volume that could be treated on them without offering significant compensating advantages were eliminated. It is not possible to calculate realistic cost savings to be gained by resource recovery and reuse without extensive discussions with existing users and owners of development property in the area. This should be a focus of a future technical analysis which would provide useful information for the RFP process (see Recommendations).



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The hosting municipalities do not propose any of these sites unconditionally nor can zoning be guaranteed for any of these sites.

Based upon the analysis in all five tasks the WTC has come to the following preliminary conclusions.

1. There is at least one site in each municipality with the sufficient area to treat its own sewage flows with appropriate technology (Note Esquimalt includes flows from the Songhees and Esquimalt First Nations).
2. There are sites that could handle all the potential sewage including Saanich and Victoria with appropriate technology.
3. There appears to be both space and available technologies that can process bio solids on some of the sites.
4. Colwood is currently investigating the potential for in-ground disposal of treated effluent and will have results in late April. The interim report states that these results will equally apply to Langford given sufficient area for disposal.
5. Tertiary level of treatment is required to meet the survey respondents' preference for reuse of treated effluent prior to disposal.

## Summary and Recommendations

The sites on the attached map are a set of reasonable candidates for treatment sites on the Westside on the basis of the technical analysis by the WTC and with the support of their respective Councils. The municipalities cannot and do not guarantee successful rezoning of the sites and do not recommend any of these sites in particular. They are only up for consideration as they appear to have some of the attributes that might help solve the problem of finding a site or sites for sewage treatment and resource recovery.

The WTC does not recommend a specific technology or level of treatment as this should be determined from the marketplace response to very precise requirements for functionality, financial guarantees, limits on net costs and legally allowable effluent parameters in the RFP along with the communities' statements on priorities following the further public consultation).

The WTC recommends the following steps be undertaken (this list includes for completeness steps already decided by the WSC or recommended by others)

1. Thorough a more comprehensive public discussion of the current list of potential sites at through further consultation using a variety of techniques before they are narrowed down to a shorter list.
2. Discussions with the owners of private land take place prior to publication of the map to ensure that they are aware of the preliminary nature of site selection.

3. Detailed discussions with municipal staff to establish the requirements for constructing a sewage treatment plant and resource recovery plant including biosolids processing at an early date to avoid committing to sites that may have costly requirements. Consideration should be given to zoning applications on a number of sites to try to secure what those conditions will be.
4. Technical input by independent experts consistent with the CALWMC decision will also be required to reduce the number of sites for further analysis.