

# **MUNICIPAL SEWAGE REGULATION**

## **INTENTIONS PAPER**

### **SUMMARY OF PUBLIC COMMENTS**

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# Municipal Sewage Regulation – Intentions Paper

## Summary of Public Comments

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## Municipal Sewage Regulation Intentions Paper – Summary of Public Comments

### Background to the consultation process

The Ministry of Environment (the ministry) is in the process of reviewing the Municipal Sewage Regulation (the regulation) of the *Environmental Management Act*. This regulation provides authorization for the treatment, reuse and discharge of domestic sewage, wastewater or municipal liquid waste by setting standards and requirements. The regulation applies to all discharges of domestic sewage except those addressed by the Sewerage System Regulation of the *Health Act* and discharges from individual single-family or duplex dwellings.

The ministry intends to revise the Municipal Sewage Regulation in three stages:

- ◆ The first stage – focuses on **reclaimed water and registration requirements**, as well as additional housekeeping amendments to the regulation. The focus is to consolidate and clarify existing requirements, add standards for reuse options not contemplated in the 1990's and provide flexibility to support new treatment technologies.
- ◆ The second stage (to be discussed in an intentions paper planned for 2010) – will address **discharges to ground and water**, and harmonize the regulation with the **Municipal Waste Water Effluent Strategy** of the Canadian Council of Ministers of the Environment (CCME).
- ◆ The third stage (to be discussed in an intentions paper planned for 2011) – will consider **design, commissioning, management, operations, environmental impact studies and security**. This stage will also address implementation (e.g., use of guidelines and best management practices documents, communications and training) and compliance (e.g., promotion, verification and enforcement) strategies.

The Ministry of Environment prepared an intentions paper that outlined the ministry's intentions for the first stage of revisions to the regulation and posted the paper for public review and comment on the ministry's website ([www.env.gov.bc.ca/epd/codes/wrbir/index.htm](http://www.env.gov.bc.ca/epd/codes/wrbir/index.htm)) from December 2009 through February 2010. The intentions paper provided background information regarding the requirements of the regulations, a discussion of the ministry's intentions and a description of the process for providing comment to the ministry. A separate response form for providing comments or suggestions to the ministry was also posted on the website.

### Purpose and format of the *Summary of Public Comments* document

This document contains a summary of the public comments received in response to the intentions paper posted by the ministry. It has been prepared for the Ministry of Environment by C. Rankin & Associates, contracted by the ministry to independently receive, compile and review comment on the ministry's intentions for revision of the regulation. The summary does not reflect the ministry's position on any issue. It provides a synopsis of the responses that are being considered by the ministry in amending the regulation without specific attribution, except to the extent required to provide context for the comments. This summary of public comments does not include all detailed comments, rather it attempts to capture the tenor and content of comments through summarization and specific excerpts from representative submissions.

The complete set of responses received through the consultation process has been compiled and passed to the ministry for detailed review and consideration. All comments and references submitted in this process, through independent submissions and through direct consultations with stakeholders, will be reviewed and carefully considered by the ministry in revising the regulation.

The summary of responses is arranged by topic as presented in the intentions paper. Direct excerpts from submissions are included in quotation marks (“ ”). Square brackets ([ ]) indicate inferred or contextual terms.

### **Description of responses received**

Close to thirty responses to the intentions paper were received (by e-mail, mail, fax and attached file), and have been reviewed for this summary of public comment. Many of the responses included detailed and technical comments and suggestions. Respondents included representatives of engineering and professional consulting firms, business and professional associations, local and federal government agencies, and individuals.

## **Summary of Responses to Consultation Questions**

### **1. Waste Management Plans and the Municipal Sewage Regulation**

*Response Form Question 1.1 Should the Municipal Sewage Regulation support prohibitions in liquid waste management plans?*

A range of responses were received on this question. Several respondents expressed a concern that “local prohibitions may be politically based and not technical” or that “prohibitions...can be construed as... [an effort by local government or citizens in the area] to restrict development by basing a zoning issue on sewage needs.” Many other respondents felt that the MSR should support prohibitions in liquid waste management plans, as “local governments and the Province share interests in regulating activities that affect development and the environment” and “otherwise [there is a] risk [of] jurisdictional arguments.”

Specific comments included:

- ◆ “Since Liquid Waste Management Plans (LWMPs) are Minister approved plans developed by local governments to address more complicated liquid waste systems and environmental issues, the requirements of such an approved site specific plan should govern over general requirements of the Municipal Sewage Regulation ”;
- ◆ “Overall management of waste management needs to be under the direction of the Ministry of Environment”;
- ◆ “Prohibitions developed through approved LWMPs should be supported where the outcomes meet, or go beyond, those in the MSR – provincial involvement in development of a LWMP, and the ultimate approval of the plan, should ensure minimum standards and appropriate site specific standards are applied ... an MSR

registration should not allow for discharge of sewage at a lower standard than what is identified in a LWMP”;

- ◆ “There should be a provision in the MSR to ensure that if it can be proven that there is an acceptable technical and economical solution for treatment and discharge with no adverse impact on the receiving environment, the local government’s approved liquid waste management plans should not be given powers which prohibit the treated sewage discharge to the specified water body”;
- ◆ “As long as First Nations are consulted during the development of the LWMP if specific water bodies are within their traditional territory”; and
- ◆ “Yes. Otherwise it compromises the intent of the LWMP. Also, the Municipalities often rely on the limitations associated with sewage treatment to support the argument to densify. Densification normally results in sewer connections to a collection system for subsequent treatment at a single larger facility. This supports smart growth and provides for economies of scale in sewage treatment and the benefits that go along with that like Integrated Resource Recovery.”

***Response Form Question 1.2 Do you have any additional comments or suggestions for the ministry when considering supporting prohibitions in liquid waste management plans?***

Several respondents noted that “prohibitions should be based on sound technical grounds.” A number also commented that if the ministry does support prohibitions there should be an avenue of appeal (such as the Environmental Appeal Board) for “submission of documentation which could support an acceptable method of treatment and discharge, which would not be a detrimental impact to human health or the environment” or “opportunity for a waiver in specific conditions if certain conditions are met...consistent with requirements of the MSR.”

Additional specific comments included:

- ◆ “It will be useful if the MSR can clarify when treated effluent is no longer to be considered ‘wastewater’ ”;
- ◆ “For water bodies with multiple jurisdictions discharging into it, the Ministry of Environment should ensure alignment between regulations and co-ordination of liquid waste management plans”; and
- ◆ “Prohibitions should originate from the provincial government – so as to avoid having drastically different wastewater management plans in different parts of a river basin prohibitions should be based on river and stream basin management plans, developed by the Ministry .”

## 2. Information required for Section 3 – “registration under Section 2 for an exemption”

*Response Form Question 2.1: Do you have any comments regarding information that should be required for registration under Section 2 for an exemption?*

This question generated a number of extensive and specific comments. While some respondents felt “content that the current regulatory requirements are adequate” others supported this clarification and commented (for example) that “the regulations should be as prescriptive as possible to ensure [that] applicants understand the rules to be followed.” Respondents recommended that “any review of a technical nature should be carried out by an appropriately qualified registered professional.”

Recommendations for specific information that should be required for registration included:

- ◆ “Definition of what is acceptable as an environmental impact [statement]...[with] a check list of key issues...to trigger specific actions in a cost effective manner”;
- ◆ “A specific registration procedure for ... membrane bioreactor and advanced oxidation (MBR+AO) systems ... [that are] an integral component of integrated resource recovery systems”; and
- ◆ “Clarification of scope and requirements [for an EIS] ... so that all studies provide a comparable level of detail and extent ... and to provide consistency across the province.”

One respondent provided detailed comments and recommendations on the topics of performance verification and penalties if the wastewater treatment plant (WWTP) is not in compliance. The respondent suggested that a “performance evaluation period of a specified duration” such as 12 months, followed by a signed verification report to the ministry, be required in the regulation. The respondent also recommended that “plants constructed as P3 [public private partnership] projects provide performance-based designs with the process design selected during the competitive bid process” and outlined the process by which performance compliance conditions should be set.

One respondent commented that a “security and capital replacement fund should not be required to be in place until the system is discharging to the environment [as] any requirement for funds to be in place prior to discharge places an unnecessary financial burden on development.” Another respondent noted that while “assurance plans are proposed as an alternative to security and capital replacement funds ... the MSR provides little guidance on what constitutes an approved assurance plan.” The respondent raised several issues related to security and capital replacement commenting, for example, that “the ministry should consider accepting alternate forms of security such as performance bonds, as opposed to the present requirement of cash based instruments only.” In the respondent’s view “the EIS is properly the basis of an application [and as] ... there is often a 1-2 year time lag between registration and final design and scope of the development ... submittal of a conceptual sewage treatment plant design should be sufficient to meet the requirements of a registration.”

*Response Form Question 2.2: Are there any instances where providing the information listed in the intentions paper (e.g., design drawings, site plan, statement of a qualified professional, notification of local government, required authorizations) would not be possible at the time of registration? Do you have any suggestions to ensure that the ministry receives all required information in a timely manner?*

Many respondents to this question commented that all information listed in the intentions paper may not be available at the time of registration due to, for example, “changes that may necessary during construction, [fine tuning of] operating and maintenance requirements during commissioning and [information gained from] post construction monitoring.”

Suggestions for providing appropriate information in a timely manner included:

- ◆ “[Require only] preliminary design drawings (for example, process flow diagrams and general arrangements) not detailed design or construction drawings”;
- ◆ “[Establish] a two stage process where a conditional approval is given followed up by a final approval – the first submission would involve doing the necessary study work to satisfy the Director the discharge will not harm the environment and to confirm the treatment levels that will be required ... this will give all parties (including local governments) [the assurance] that the foundation of the project is good – at that point ... the proponent can then proceed with the detailed design and submit those detailed drawings to the MOE in order to finalize the registration”;
- ◆ “We suggest that the information be provided at defined milestones in the registration process”;
- ◆ “[In cases where it is difficult to provide all information at the time of registration, such as P3 [public private partnership] and water reclamation/reuse projects we propose] that the proponents and the design team work with MOE to develop a strategy which ensures that they receive all require information in a timely manner”;
- ◆ “Operation contracts and maintenance schedules may not be available at registration but could be conditional”; and
- ◆ “If a rezoning approval requires registration, it is inappropriate to provide detailed design drawings at the time of registration ... the timing of submissions should reflect the relevant regulatory approval processes so that detailed assessments and engineering is not carried out prematurely.”

### **3. Conditions for releasing discharges**

*Response Form Question 3.1: Do you have any comments regarding the ministry’s intention to add a new condition to the regulation that the director be notified two weeks prior to the commencement of discharge?*

While most respondents who commented on this question supported the ministry's intention, a few included caveats or clarified with their comments. Several respondents felt that notification would be appropriate as a declaration only – to indicate to the ministry the commencement of commissioning and discharge in compliance with the regulation. One respondent noted that “it is common for a plant to require an initial start up period...to achieve compliance with its registration limits.” The respondent also commented that “inspection ... [for compliance with registration requirements] must take place at an earlier stage in construction – otherwise [there] is potential for costly delay and unacceptable uncertainty.” Another respondent, in contrast, pointed out that “in some jurisdictions there is a site review done approximately two weeks before commencement of discharge” and that “this is a good and necessary part of the process.” One respondent commented that “it may not be practical to give an exact amount of notice ... hence a notice period should be described as a ‘minimum’.”

**Response Form Question 3.2: Do you have any comments regarding the period of time required for notification (e.g., should it be two weeks or a month prior to commencement of the discharge)?**

Responses to this question echoed those to question 3.1. Respondents generally commented that a minimum of two weeks notice “seems reasonable” but that a month would also be “acceptable.” Some respondents expressed concern or requested clarification from the ministry that the notification is seen as a “courtesy” only and not as “an integral part of the approval process.” One respondent suggested that “one month would be appropriate if notification to the public is needed [as] this would allow adequate time for MOE to post in the local papers.” Another respondent suggested that the ministry consider “leaving the time period less defined and perhaps listed ‘as agreed’ to allow the ministry to select time for each application based parameters such as: size of plant, inherent risk and availability of regulatory resources.”

#### **4. Definitions of Qualified Professionals and Certified Operators**

**Response Form Question 4.1: Do you have any comments regarding the ministry's intention to harmonize and clarify the role of qualified professionals under terms of the regulation?**

Respondents who commented on this question supported the ministry's intention to harmonize and clarify the role of qualified professionals under the regulation. Several respondents provided more specific comment, for example: “the definition and role of Qualified Professionals under the Organic Matter Recycling Regulation (OMRR) has been very workable [for our organization]”; “providing guidance regarding the appropriate skill sets and competencies is fundamental – this can be dealt with in professional practice guidelines by the appropriate professional regulatory bodies”; “it should be noted [that] some aspects of wastewater management systems require a Professional Engineer, according to the *Engineers and Geoscientists Act of BC*”; and “the concept of having a Coordinating Registered Professional ... should be considered.”

**Response Form Question 4.2: Do you have any comments regarding the ministry's intention to affirm in the regulation that operators must be certified by the Environmental Operators Certification Program (removing allowance for alternate certifications from the regulation)?**

Respondents differed considerably in their comments on this topic. Some respondents expressed support for the intention, commenting, for example, that "[it is] better to have only one approved certification" or that "[this] closes the loopholes as the EOCP is our industry standard." Other respondents raised specific concerns or expressed "strong disagreement" with the intention. Specific comments on this topic included:

- ◆ "Alternate certifications are needed if only to avoid having only one option";
- ◆ "The EOCP is a well respected certification body, however the training requirements and certification requirement are appropriate for traditional municipal wastewater facilities only – EOCP certification is not suitable for soil discharge and treatment systems, small modular wastewater treatment systems or water reclamation systems of any size"; and
- ◆ "Smaller systems fall under the Sewerage System Regulation, and must be maintained by practitioners registered by the Applied Science Technologists and Technicians of BC (ASTTBC); whereas larger systems fall under the MSR and would be required to be operated by an EOCP certified operator should alternative qualifications no longer be accepted – both EOCP and ASTTBC qualifications have their relative strengths, and some combination of these strengths would likely best serve the owners of small community wastewater systems – if qualification under the MSR is strictly limited to EOCP, the strengths of the ASTTBC program (particularly knowledge and experience with soil-based treatment processes) may not readily transfer to small systems registered under the MSR, and harmonization of the two standards may be more difficult to achieve."

## **5. Timing for submitting information**

**Response Form Question 5.1: Do you have any comments or suggestions for the ministry regarding whether the regulation should continue to require submission of an operating plan and environmental impact study "before construction" or eliminate this requirement?**

Most supported removing the phrase "before construction" in the requirements for an operating plan and environmental impact study (EIS). Several respondents commented that while a completed environmental impact study is a "logical" or "appropriate" requirement at the time design is initiated, it may not be appropriate to require a completed operating plan as such a plan "may not be finalized until commissioning and post construction monitoring is complete."

Specific comments included:

- ◆ “In practice, it typically takes the Ministry much more time than [90 days] to process the application – leaving the developer/builder still wondering whether they should proceed with construction”;
- ◆ “For P3 projects and water reclamation projects, there should not be a requirement for an operating plan to be submitted before construction begins – the QP will need to see the operations and control philosophy at least 60 days prior to start-up, but not necessarily at the time of Registration – the issues related to an Environmental Impact Study are all related to best management practices and for a P3 project, these are addressed in the contract documents”;
- ◆ “Provision somehow needs to be included such that low risk components can be installed at the risk of the developer/builder – should he choose – prior to the 90 day period ending”;
- ◆ “It is important that an EIS and Operating Plan be submitted with the Registration, a minimum of 90 days prior to start of construction, however, only when ready to discharge should completed and sealed documents be submitted as a condition of compliance with the MSR and confirmation of no detrimental impact to human health and the environment”; and
- ◆ “The Operating Plan could be submitted 90 days prior to commissioning of the plant. – however, this would apply to construction of the sewage treatment facility only and not other unaffected components of the infrastructure.”

## 6. Schedule 7 – design standards for sewage facilities

*Response Form Question 6.1: Do you have any comments regarding the ministry’s intention to clarify that design standards for a sewage facility require “written approval of the director”?*

The majority of the respondents supported this clarification. Several respondents commented that written approval from the ministry would “clear any misconceptions” and “provide the discharger with certainty as to whether the ministry is satisfied.” Respondents also cautioned however that (for example) “design standards are too complex for the requirement ... to be meaningful ... it is unrealistic to expect ministry staff to evaluate and make recommendations for approval of design standards to the director” and “there is a risk of inducing excessive delay in time sensitive projects.”

Specific comments included:

- ◆ “We would prefer that the Director participate in the development and implementation of these IRR projects ... QPs will need to work closely with the MOE Directors and support staff to establish a new set of criteria and standards for water reclamation/reuse”;

- ♦ “MOE should consider providing a model as the basis for written approval based on size of discharge, and risk to the receiving environment”;
- ♦ “Written approval should not be unreasonably withheld and if approval is not received within 30 days, then approval by the Director would be assumed”;
- ♦ “Only if subject to reasonable appeal processes”; and
- ♦ “I firmly believe that the MOE should also provide a review function, if it does not already; particularly smaller plants designed for developers and other private interests.”

## 7. “Beneficial use” of reclaimed water

*Response Form Question 7.1: Do you have any comments or suggestions regarding inclusion of a requirement that use of reclaimed water should be “beneficial” and inclusion of a definition of “beneficial use” in the Municipal Sewage Regulation (reflecting information in the existing Code of Practice for Reclaimed Water)?*

Several respondents expressed concern that attempting to define “beneficial use” is subjective and could impose an inappropriate barrier on use of reclaimed water. One respondent, for example, recommended that “Reclaimed water should be defined only by quality objective for the protection of public health and environment – it is inappropriate for the government to decide what is beneficial or not.” Another respondent questioned the intended approach: “How much benefit is required in order to consider a discharge beneficial? Why is no harm not sufficient as a starting point?”

Other respondents recommended inclusive definitions of beneficial use, such as:

- ♦ “All reclaimed water that meets prescribed water quality is ‘beneficial’ under a broad interpretation of water sustainability”;
- ♦ “A possible definition of ‘beneficial use’ might be: ‘use of reclaimed water for irrigation, municipal, recreational/aesthetic, agriculture, aquaculture, emergency, commercial, industrial, and ecological uses (including habitat restoration, maintaining aquifer levels and increasing stream flows) and replenishing water sources’ ”; and
- ♦ “Rather than trying to define ‘beneficial’ ... say: ‘water reuse for the following purposes: conservation of natural resources; enhancing the environment; improving biological or physical processes, and to support sustainable communities’.”

One respondent noted that “there needs to be harmonization between the Health [Act], BC Building Code, MOE and SSBC for determining acceptable use of reclaimed water ... [including] clarification for acceptable use in toilets, urinals [and for] irrigation (non-food)”. A number of respondents also raised a “critical concern ... that when a discharge is no longer [considered to be] beneficial it does not have to cease ... for example ... reuse for stream augmentation ... if acceptable at no dilution ... should be acceptable at any dilution.”

**Response Form Question 7.2: Do you have any suggestions for additional types of “beneficial use” of reclaimed water (not identified in the current Code of Practice for Reclaimed Water) that should be included in the regulation and/or code?**

Several respondents pointed to their responses to question 7.1 noting, for example, that “if you do not use the beneficial use terminology you do not have to worry about missing something.” A number of respondents commented that any list of “beneficial uses” of reclaimed water should be left open or remain flexible as such uses will change with (for example) “technological improvements, innovation, needs and economics.” One respondent felt that “the ultimate MOE goal should be that a QP can take water from the storm water retention pond which is receiving a small volumetric percentage of WWTP effluent having drinking water quality standards, and provide further treatment so that this water can be introduced into the potable water system [as] is now done in Orange County, California and also sanctioned in Washington State.” The respondent noted that “each water reclamation/reuse location will have different site conditions and thus, a different water reuse strategy.”

Specific “beneficial uses” identified by respondents included:

- ◆ “Use in industrial processes – such as hydronic heating water systems, car wash, laundry”;
- ◆ “Augment[ing] or offset[ting] other water supply sources/resources”;
- ◆ “Sustainable infrastructure [and] sustainable communities”;
- ◆ “District heating systems whereby the heat from sewage can be captured for beneficial use in the processes and/or building heating systems”;
- ◆ “Any water application requirement or need that can be met by a source of non-potable water, while ensuring the environment and public health and safety are protected”;
- ◆ “All of the uses contemplated in the USEPA categories”; and
- ◆ “Discharge to wetlands [to] enhance function ... particularly in areas where water withdrawals ... have harmed wetland function by causing seasonal or year-around desiccation.”

## **8. “Cross connection” and other building/plumbing code issues**

**Response Form Question 8.1: Do you have any comments or suggestions for the ministry regarding provisions in the regulation intended to prevent cross connection and contamination of potable water (e.g., revisions to sections 10(5) and (6) and 22(1) of the regulation)?**

Respondents commonly recommended “an approach which ensures consistency” and/or “removing overlap” between legislation and regulations. Several respondents commented that the MSR “should probably not include aspects of the plumbing code.” Other respondents felt

that explicit cross-reference is “absolutely required – [the MSR] should be consistent with CAN B64.10 and B.C. plumbing code or those standards and codes should be adjusted so that all agree.” A number of respondents pointed out that “although section 22(1) of the MSR refers to a ‘certified cross connection control inspector’, at this time there is no such designation or certification in British Columbia.” Several respondents pointed to the State of Washington which has a designation called a “cross connection control specialist” as a good “model [for B.C.] to work with.” One respondent suggested that “if the intention of the MSR is to have a qualified person OPERATE the dual distribution systems then the environmental operator’s certification program should be amended to include a specialization in cross connection control for dual water systems.”

*Response Form Question 8.2: Do you have any other comments or suggestions for the ministry related to consistency between the regulation and building/plumbing codes?*

Respondents commonly expressed support for “harmonization” and/or “consistency” between regulations. Specific comments included:

- ◆ “There must be ... a clearly defined approval process that is simple and involves a single approving authority”; and
- ◆ “There should be no overlap – the MSR should focus on discharges to the environment and treatment/reuse standards – the building code protects people by specifying appropriate building and plumbing requirements – health standards should specify requirements for water used in the home and for drinking water supplies”.

## 9. Irrigating food crops with reclaimed water

*Response Form Question 9.1: Do you have any comments or suggestions for the ministry regarding monitoring and assessing emerging contaminants of concern related to the irrigation of food crops with reclaimed water?*

Some respondents supported the ministry’s “continuing participation in working groups and the assessment of emerging contaminants of concern” and saw “no need to change the regulation at this time.” Other respondents commented that “continuing research is prudent,” that “further monitoring of pharmaceuticals is a must” or that “there should be monitoring of emerging contaminants for facilities discharging a ‘large’ volume of reclaimed water to type 1 or type 2 uses.” A respondent suggested that during “initial operation of the MBR+AO system... QPs could work with MOE professionals who can assist in identifying the contaminants of concern and interpret the data from the monitoring program ... QPs will require assistance from provincial, federal and university researchers to establish the monitoring program and assess the potential impact on crop/product quality [and] QPs should work with and share this information with the MOE.”

**Response Form Question 9.2: Do you have any other comments or suggestions for the ministry regarding the irrigation of food crops with reclaimed water?**

Limited and divergent comments were received in response to this question. Some respondents felt that “no amendments to the regulation are seen to be warranted in regards to irrigating crops”. Other respondents expressed caution, stating (for example) that “I think this is a bad idea ... I really question how comprehensive the research is on the fate of various contaminants in the soil, plants, and ultimately the human body if those plants are consumed.”

Other specific comments included:

- ◆ “We are confident that we will be able to implement a monitoring program which, with the assistance of professionals in government and university research programs, will provide important information to address this area of concern”;
- ◆ “It is important to differentiate existing standards, with the ability to comply with changes to treatment standards which could be required in the future”; and
- ◆ “The regulation may consider where irrigation is completed and the irrigation practices – if irrigation is completed in remote locations, within greenhouses or other areas where the public has limited access, various alternative irrigation techniques may provide safe, cost effective use of treated wastewater using a lower effluent quality from the wastewater treatment plant.”

## 10. Multi-agency review and approval of reclaimed water uses

**Response Form Question 10.1: Do you have any comments or suggestions for the ministry regarding review and approval responsibilities of local health officers and/or provincial ministries other than the Ministry of Environment when using reclaimed water?**

Several respondents commented that while Health Officers and the Ministry of Health are important stakeholders and need to be involved in setting health standards, the ministry should carefully consider the implications of the parties who might have approval responsibilities under the regulation. Specific comments included: “clarification of roles is welcome”; “local health officers have little or no expertise such as water reclamation and not-potable water applications”; “to have the Health Officer approval would negate the ability of the QP to submit a system for registration in a timely manner”; “MOH should be given an opportunity to comment – MOE should address any concerns brought up by the health officers, however, final decision should be made by MOE which is the implementation and enforcement body of the MSR”; and “[our organization] supports local health officers or specifically identified positions in other ministries having review and approval responsibilities we recommend such approvals occur prior to construction and not registration.”

*Response Form Question 10.2: Do you have any comments regarding the suggestion that approval for reclaimed water use be similar to that for biosolid applications authorized by the Organic Matter Recycling Regulation (i.e., if applications are not responded to within a specified time period then the application would be considered to be approved)?*

Most respondents who commented on this topic agreed with or expressed support for the approach outlined by the ministry. Some respondents provided specific recommendations or situations where the approach could be inappropriate or refined.

Specific comments included:

- ◆ “We would hope that our developmental and demonstration programs are of sufficient interest and importance that the applications would be reviewed and commented on within the timeframe provided”;
- ◆ “Appeals and expressions of concern by well meaning individuals with limited access to relevant technical information and knowledge ... will drag out the registration process and likely inhibit dischargers who would otherwise consider reclaimed water options due to the potential for unknown road blocks through respondents with unsubstantiated concerns”; and
- ◆ “I prefer positive confirmation from the MOE – that way there is a mechanism to alert the local government and other relevant agencies that a discharge is contemplated and approved.”

## **11. Reorganizing and consolidating regulatory requirements related to reclaimed water**

### **A. Storage, alternate disposal and system reliability**

*Response Form Question 11.1: Do you have any comments regarding the ministry’s intentions to reduce redundancy related to storage requirements and to clarify applicable storage provisions in the regulation?*

Respondents who commented on this topic universally supported the ministry’s intention to reduce redundancy requirements and clarify storage provisions of the MSR. Several respondents provided specific examples of how existing requirements result in “excessive” obligations, “over-kill” or “a monumental obstacle to water and resource recovery in B.C.”

Specific comments included:

- ◆ “In many cases, the registrant has alternative disposal options available and equipment redundancy and emergency and long term storage requirements are unnecessary”;
- ◆ “Storage requirements and treatment process redundancy for a beneficial reuse project need to be established on a case-by-case basis”;

- ◆ “Meeting the satisfaction of the Director is too vague – there should be some discretion based on a province wide understanding and the risk factors presented;”
- ◆ “The business case will drive solutions and feasible options and barriers in the regulations to implementing reclaim water use should be eliminated”;
- ◆ “It is unclear why redundancy is required for the reclaimed water process if providing reclaimed water is not a critical component of meeting the Regulation or the supply of water in general”; and
- ◆ “[Our company] would like to work with MOE where reclaimed water reuse affects local governments, such as to identify how reclaimed water requirements can facilitate development of higher-density areas where downstream sewer trunk capacity is limited.”

*Response Form Question 11.2: Do you have any comments or suggestions regarding the ministry’s intention that the exemption from having to provide alternate disposal capacity should only apply to non-residential and non-institutional settings?*

Some respondents felt that the exemption should apply to all discharges and settings. Examples of comments included: “the exemption for non-residential and non-institutional settings doesn’t make much sense – either an exemption is warranted because alternatives ... exist or there is a need for storage and equipment contingencies”; “surely the criteria listed – ‘public health is protected’, and “the exemption for alternative disposal capacity should be based on technical grounds and not on the source of the effluent.”

Other comments received included “The proposed requirements appear reasonable and should effectively protect the environment in the event of a facility shut down”.

## **B. Requirements for effluent disinfection**

*Response Form Question 11.3: Do you have any comments regarding the ministry’s intentions to clarify that effluent disinfection is required for reclaimed water and consolidate related regulatory provisions?*

Most respondents agreed with this policy. Other respondents commented that “there will be cases when effluent disinfection for [reclaimed] water is not required” recommending rather that “disinfection requirements should be based on the [end]use rather than a blanket requirement” and/or that “these exemptions should be addressed on a case-by-case basis with approval given at the discretion of the Director.”

Other comments included:

- ◆ “There is no need to dechlorinate before discharging to surface water near a water well”; and

- ◆ “The need to dechlorinate reclaimed water to below 0.01 mg/L before reuse is permitted for all reuse applications seems unclear ... it is very difficult to measure chlorine concentrations around 0.01 mg/L ... consideration should be given to require measurement of a sulphite residual in place of chlorine – the presence of sulphite in small dose provides an indication that chlorine has been removed ... this policy paper does not include this alternative measurement technique.”

### C. Environmental impact study requirements

*Response Form Question 11.4: Do you have any comments regarding the ministry’s intentions to clarify that provisions for an environmental impact study apply to reclaimed water uses and should also account for both water quantity and water quality?*

Most respondents who commented on this topic felt that “if an environmental impact study adds value to the approval process, it should be included.” One respondent commented that “the EIS requirement should be the same as that for any discharge” and another felt that “an environmental impact study should only be an optional requirement for discharges to water.”

Additional specific comments included:

- ◆ “The Ministry needs to clarify that discharge of Category 1 reclaimed water be based on scientific principles – Category 1 reclaimed water should be allowed to be discharged to surface waters provided discharge criteria are met at the point of discharge and not be provisional on dilution ratios”;
- ◆ “Avoid using terms like ‘explain’ – better to expand and request ‘provide information that satisfies the regulation’ ”; and
- ◆ “The objectives and the contents with respect to water quantity and water quality should be left to the EIS Guidelines.”

### D. Operating plan requirements

*Response Form Question 11.5: Do you have any comments or suggestions regarding the ministry’s intention to include commissioning plan requirements as part of the operating plan?*

Most respondents who commented on this topic expressed agreement with or support for the ministry’s intention noting, for example, that “the changes are relevant and suitable.” One respondent recommended further that “submission of an operations manual including detailed operations procedures should not be required until just prior to discharge.”

*Response Form Question 11.6: Do you have any comments regarding the ministry’s intention to require inclusion of a certified irrigation plan (including metal and salt limits and reference to federal water quality standards) in the operating plan?*

Respondents who commented on this topic commonly expressed no objection to the ministry's intention. One respondent reiterated a comment that "use of reclaimed water should NOT include requirements additional to those for other sources of water" while another respondent commented that "Having an agronomist's report or assessment as part of the EIS and OP [operating plan] should be sufficient – the key should be whether the metal and salt loading are likely to affect the efficacy of using reclaimed water for irrigation – there is no need to reference federal water quality standards".

Specific comments or recommendations included:

- ◆ "Using certified designers is a good step to ensure that the system is designed with good uniformity and will ensure better performance"; and
- ◆ "Any requirements for such plans can be identified in a professional practice guideline developed by the appropriate professional regulatory body – [our organization] recommends that the specification of metal and salt limits and water quality standards be addressed in guidelines produced by the ministry which include both ground water and surface water while specifying the point of compliance."

*Response Form Question 11.7: Do you have any comments regarding the ministry's intention to clarify requirements that a contingency plan be included in the operating plan?*

Respondents to this question commonly expressed "support" or "no objection" as a contingency plan "is an important part of an operating plan." Several respondents cautioned that the size of reclamation systems will vary greatly and "care should be taken to make requirements reasonable."

## **E. Notification of malfunction**

*Response Form Question 11.8: Do you have any comments regarding the ministry's intention to require that the local health officers be immediately notified of any system malfunctions or other condition which results or may result in a risk to public health?*

While respondents who commented on this topic commonly acknowledged the importance of timely notification, some expressed a "concern about creating a situation of over caution" and that "if it is simply a system problem that does not impact the safety of the reclaimed water, there should be no [need for] notice." Some respondents raised questions, such as: "Is there capacity to address all potential malfunction reports?" and "What is the purpose of the notification? Who will respond? What actions would be required of the operator other than notification?" One respondent noted that "there is also a need for better communication between the health officers and local government [who also need to be notified of any system malfunctions]."

## F. Monitoring requirements

*Response Form Question 11.9: Do you have any comments or suggestions regarding the ministry's intended consolidation of and revisions to monitoring requirements for use of reclaimed water?*

Many respondents commented that “consolidation and clarification of monitoring requirements would be helpful” often adding that the monitoring “should have a specific purpose” or “requirements should be tailored to the scope of the facility and the levels of environmental and health risk.” One respondent, for example, noted that “the impacts of reclaimed water vary, first depending on use, second depending on volume and third depending on discharge method.” Respondents differed in their comments regarding ground and surface water monitoring requirements – some respondents felt that “the addition of groundwater and surface water monitoring may be over-kill” while others felt that “a discharge to water or land should look to the same section of the MSR for monitoring requirements.”

Additional specific comments included:

- ◆ “We would work with the MOE staff to develop the initial monitoring and reporting requirements – verification of the adequacy of the monitoring program would be an essential component of this exercise”;
- ◆ “The monitoring currently outlined only relates to effluent sampling and not treatment processes – this is problematic and potentially miss-informative ... a process monitoring procedure should be in place for all reclaimed water systems – this would be a less expensive and more reliable and proactive approach”; and
- ◆ “A definition of ‘receiving environment’ would be helpful.”

## G. Annual reporting requirements

*Response Form Question 11.10: Do you have any comments or suggestions regarding the ministry's intentions for clarifying annual reporting requirements related to reclaimed water?*

Respondents commonly expressed “no objection to” or “support for” the stated intentions, provided that annual reporting is “appropriate for the type of water reclamation use and size of flow.” Additional comments included: “reporting of residential reclaimed water use should not be greater than that required for drinking water use”; and some [of our organization's] members have expressed concern with the state of the technology used in the provincial government's databases ... the technology [should] be updated for efficiency and to improve consistency between ministries.”

## H. Appendix 3 of Schedule 7 – Health and Safety Criteria for Use of Reclaimed Water

*Response Form Question 11.11: Do you have any comments regarding the ministry's intention to move provisions of Schedule 7 of Appendix 3 from the regulation to the Code of Practice for Use of Reclaimed Water, with provisions requiring compliance with the health and safety criteria and annual reporting of monitoring remaining in the regulation?*

Most respondents agreed to this intention to move most provisions from Schedule 7's Appendix 3 to the regulation's reclaimed water guidance document. Specific comments concerning this topic included:

- ◆ "There are various aspects of Health and Safety Criteria related to water reclamation/reuse within residential and commercial units which MOE have not addressed. On the completion of a successful demonstration project incorporating the technology and reuse applications identified in Section 2.1(d), the various aspects of Health and Safety Criteria related to water reuse will have to be revisited [and] section 5.5H will have to be amended when this demonstration project has been completed"; and
- ◆ "There should be a clear statement as to the legal standing of the Code of Practice – i.e., is it a schedule to the legislation (i.e., statutory provision) or is it a guideline (i.e., optional)."

*Response Form Question 11.12: Do you have any comments or suggestions regarding the ministry's intention to remove the 60 meter "food setback provision" presently contained in Appendix 3 of Schedule 7?*

Respondents who commented on this topic expressed support for the ministry's intention with such comments as: "the setback as it stands is arbitrary"; "if the WWTP is in enclosed with an HVAC [Heating, Ventilation, and Air Conditioning] system in operation and the reclaimed water for recycling has been disinfected ... this should be addressed on a case-by-case basis"; and "this is a reasonable improvement, which can be adequately addressed in operating requirements."

*Response Form Question 11.13: Do you have any suggestions regarding any other health and safety criteria requirements (including those that are presently in Appendix 3 of Schedule 7) that should remain in or be added to the regulation?*

There was support from most respondents that the critical requirements in Schedule 7's Appendix 3 that were identified in the policy intentions paper should remain in the regulation. However a respondent commented that "[Our organization] feels that they should be moved to the code of practice and not remain in the regulations."

Specific comments concerning this topic included:

- ◆ “Appendix 3 of Schedule 7 does not address the issues related to the use of reclaimed water, which has been treated to drinking water quality standards, and combined with stormwater ... many scenarios are feasible and will be encountered as the MOE embarks on and participates in the implementation of an effective IRR program ... there will be amendments and revisions required to address these water reclamation/reuse programs”;
- ◆ “There should be clarification about setbacks between sewer lines and potable water lines allowing a closer separation such that there are not 3 distinct pipelines as there is little room for other services”;
- ◆ “Standardize on pipe colour for reclaim water lines – i.e., PURPLE”;
- ◆ “The intentions paper outlines three categories of reclaimed water, the worst allowable discharge in the reclaimed categories has a CFU of 200 – this is the same as bathing water quality (WHO [World Health Organization] uses 1000) ... there are several other safety margins in place, monitoring, redundancy, storage, alternate disposal – it would seem then that if we are already assured that the water quality is high then why would you place yet another restriction on use?”; and
- ◆ “There should be proper signage where reclaimed water is used. Cross connection should be avoided, therefore provisions should be included in the MSR or Plumbing Code that only qualified plumbers (persons) should be allowed to install or maintain reclaimed water plumbing and fixture”.

## I. Schedule 7(6) “Reclaimed Water Application”

*Response Form Question 11.14: Do you have any comments regarding the ministry’s intentions to consolidate provisions of Schedule 7(6) in a “reclaimed water” section of the regulation?*

While most respondents who commented on this topic felt that consolidation “should be helpful”, a number of respondents raised specific concerns and recommendations:

- ◆ “6(3)(C) is unnecessarily prohibitive”;
- ◆ “There are presently no proposed standards for environmental uses of reclaimed water which approach the quality which we will be using in our water reclamation systems. As a result, Column D of Table 1 will either have to change or a Column E added which reflects the quality of water which we will generate following MBR+AO treatment ... we believe that we will definitely require a Column E which will include targeted numbers – these numbers should be determined based on actual system performance data ... and should be approved on a case-by-case basis”;
- ◆ “(4) could better be dealt with by allowing the reduced field area immediately, with an appropriate fund for future expansion if required after 5 years or sooner – this provides incentive to provide critical review, while at the same time providing protection with the funds set aside”;

- ◆ “It is unclear whether there should be a separate section for reclaimed water or whether the reclaimed water requirements should be integrated into the body of the MSR – it is very important that a reclaimed wastewater facility does not face more requirements than a secondary treatment facility – reclaimed water facilities should be encouraged over lower effluent quality processes as they provide increased protection to the environment and provide opportunity for reuse”; and
- ◆ “The difference in requirements for the treatment plant itself should only be the quality of the effluent. Other differences should be related to where the treated effluent goes – and requirements for discharge to the natural environment should be included in the relevant portions of the MSR (i.e., water or land disposal). The authority for regulating should be transferred to the appropriate regulating body (i.e., not MOE ) when the reclaimed water is to be used within buildings. (e.g., building code, Health Authority).”

## 12. Irrigating food crops with reclaimed water

### A. Types of reclaimed water use

*Response Form Question 12.1: Do you have any comments or suggestions for the ministry regarding the four proposed “types” of permitted uses (see intentions paper tables 1 and 2) and their effectiveness in providing clear regulatory direction and flexibility? Are there any reclaimed water uses that you would move to another type and why?*

Overall respondents supported the direction of having more categories of reclaimed water with different standards based on different exposure risks. While some respondents who commented on this topic felt that the intended direction is “a good idea” or a “good concept” several respondents voiced comments or recommendations regarding the proposed types of uses and accompanying definitions. Related and specific comments included:

- ◆ “[We recommend] a fifth column, i.e., a Column E which addresses non-potable reuse within residential or commercial units. This would be reclaimed water for discharge to rainwater/stormwater management or storage systems which would be retained in the system and only discharged during periods of high rainfall”;
- ◆ “There may be too many categories, merging should be considered – ensure that examples are that ONLY and not seen as strict limitation on either use or category”;
- ◆ “It is not clear if certain valuable reclaimed water uses, for example, use of water in evapo-transpiration cells for urban heat sinks, would be covered or permitted – also, indirect discharge of high quality water to surface water drainage systems, for example, through exfiltration cells, does not appear to fit into a category”;
- ◆ “There is an inconsistency in parameters, and provision for measuring should be identified – for example, the impoundments with BOD and TSS at 25 mg/L would have difficulty in achieving fecal limits unless after the impoundment (settling) or with high doses of chlorine”;

- ◆ “In general, this risk/exposure approach is preferred over the “old” Schedule 2 approach, but clarity still needs to be improved”;
- ◆ “Marine estuary should be added to Type 1, B – acute toxicity should be added to the list”;
- ◆ “We would ... suggest that the MSR provide flexibility for small remote communities by relaxing [BOD/TSS/FC] effluent quality requirement[s], provided that [the] EIS verifies that no adverse impact will be caused by such a discharge”;
- ◆ “Definitions [for such terms as streams, wetland, aquatic environment] as [they] pertain to this legislation should be made clear ... as there are different definitions for these terms in different provincial legislation”;
- ◆ “[Our organization] supports the concepts reflected in the four categories as they provide a greater range of reuse applications, however there is no rationale for the water quality parameters selected – it would be helpful to have some quantitative human health risk and environmental assessment analysis to support the categorization – we point out that other jurisdictions, such as Washington State, have found it administratively appropriate to reduce the number of ‘types’ to two (similar to the current MSR reclaimed water categories), and that other US states are reported to be following suit”; and
- ◆ “Greenhouse operations should be defined separately as they would have minimal public exposure.”

*Response Form Question 12.2: Do you have any comments or suggestions regarding the reclaimed water uses and standards associated with proposed type 1 (“highest environmental risk”) uses? Do you feel that the regulation should: 1) contain the standards in table 1 only; 2) contain the standards set out in table 1 as a baseline while also providing the director with the authority to set stricter standards based on site specific conditions; or 3) contain the standards set out in table 1 as a baseline while also providing the director with the authority to set both stricter or less strict standards based on the impact to the receiving environment?*

Most of the respondents who commented on this topic supported the third option described in the intentions paper (“contain the standards set out in table 1 as a baseline while also providing the director with the authority to set both stricter or less strict standards based on the impact to the receiving environment”). Some respondents noted caveats or provided more specific comments, including: “while providing the Director with the authority to set either stricter or less strict standards – these standards should be based on either the impact on the receiving environment or the intended water reuse application which is being proposed”; “flexibility is generally good, however given the previous experience and sector compliance record, it may not be appropriate to allow for more relaxed standards”; and “flexibility [should be] based on the EIS and flow discharge category, and not at the director's decision...”

A number of specific comments were also received, including:

- ◆ “[Our group] questions the division of uses into env risk and health risk – each use will have some of each – further, why separate the ‘disposal’ standards from these tables? In reality we have a full spectrum of water dispositions, from marine discharge to landscape irrigation, each with its own unique risks and quality requirements based on local factors. Why not have one table of guideline standards for the full range of water dispositions, with specific methodologies for adjusting the standards as required?”;
- ◆ “Table 2 in the old MSR does need revision but I completely disagree that habitat restoration wetlands should be included in the Highest Environmental Risk category, higher than toilet flushing – in fact the effluent quality requirements A through D in Table 1 of the intentions paper, from lowest to highest quality requirements, is the reverse of the respective target environment’s natural ability to renovate sewage ... greater thought needs to be put into the risk matrix used to build these tables”;
- ◆ “The set standard should apply as a minimum – otherwise the effort to establish a standard is wasted – an EIS should establish higher standards where the specific environmental, or public, conditions require that standard the nutrient requirements should come from an EIS, done by a QP, not just from a QP directly as is implied by the list in Table 1B – the reclaimed part of the MSR should be the same basis as the rest of the MSR - i.e., minimum discharge standards plus EIS for site specific”; and
- ◆ “When treatment plants in the Province upgrade to secondary to meet the CCME ... the new plants will automatically produce effluent meeting Type 4 industrial reclaimed water – adding a 45 mg/L maximum limit will add significant additional cost.”

***Response Form Question 12.3: Do you have any comments regarding inclusion of monitoring and reporting information in the same tables as the reclaimed water standards?***

Limited detailed comment was received in response to this question and those that did respond mostly agreed with this policy intention. Specific comments made by respondents included:

- ◆ “Monitoring requirements need to be appropriate for the scale and risks of the particular application – therefore should not appear in the table”;
- ◆ “Yes it is good to report the monitoring information with the standards as long as it is clear that ... these are the baseline standards and may be stricter based on site specific conditions”;
- ◆ “All the monitoring requirements for discharges, whether for discharge of reclaimed water or for treated effluent, should be in the same place in the MSR”;
- ◆ “Reporting and monitoring requirements [should be] appropriate to the scale, nature and application relevant to the project and site”;
- ◆ “The TRC [total residual chlorine] standard is not listed and, further, they seem unreasonably low – turbidity is only an indicator (i.e., not a direct health effect) of poor drinking water quality”; and

- ◆ “The regulation [should] include requirements for monitoring irrigation run-off – if fields are over irrigated, reclaim water could flow into small streams and create an environmental impact to the stream.”

*Response Form Question 12.4: Do you have any comments regarding turbidity/total suspended solids (TSS) monitoring requirements for type 2 (highest exposure potential) water uses (e.g., whether TSS monitoring requirements should include an average like turbidity, or only a maximum value)?*

Differing comments were received in response to this question. Some respondents felt that the regulation should “include both an average and a maximum [TSS value]” while another recommended “average values [only].” One respondent commented that “the use of online turbidimeters can provide continuous monitoring as an acceptable parameter at reasonable cost” while another felt that “online turbidity instruments are subject to fluctuating readings inherent in the design.” One respondent recommended that “the necessary flexibility be provided so that reporting and monitoring requirements are appropriate to the scale, nature and application relevant to the project and site (e.g., larger scale projects and sensitive receiving environments may require more rigorous monitoring).”

*Response Form Question 12.5: Do you have any comments or recommendations with respect to whether the fecal coliform standard for type 2 water uses should be 1 CFU/100mL or remain at the current median of 2.2 CFU/100mL?*

Specific comments in response to this question included:

- ◆ “The Membrane Filtration Technique (MFT) involves filtering a sample volume and counting the number of colonies that form with a detection limit of 1 CFU/100 mL (Colony Forming Unit) – they are not the same assessment standard but essentially mean ‘non-detected fecal coliform bacteria using either MFT or MTF techniques’ – for Type 2 reclaimed water it is recommended that MFT (i.e., less than 1 CFU/100 mL) be used”;
- ◆ “Provisions for exclusions based on a data base correlated with the surrogate(s) should be agreed to when the monitoring program is established”;
- ◆ “Until such time as a test can be valid and quick, reducing a single point parameter is ineffective and does not prevent discharge from having already occurred, so is of little benefit”;
- ◆ “Remain as is”; and
- ◆ “The standard is at the appropriate level and both criteria should be included but specified as 1 CFU/100 mL and 2.2 MPN/100 mL, as they are different tests – the values represent the detection limit of the Membrane Filter Test (MFT) and Multiple Tube Fermentation (MTF) protocols, respectively.”

**Response Form Question 12.6: Do you have any comments or recommendations regarding worker contact standards for specified or all types of reclaimed water use (e.g., the existing requirement that worker contact with reclaimed water be minimized, the ministry's intention to require a higher level of disinfection to a maximum 14 CFU/100mL (or equivalent MPN) based on daily sampling where frequent worker contact is likely)?**

Comments in response to this question included "worker safety is paramount"; "this is acceptable"; daily sampling should never be required as many communities can only sample on weekdays"; "the ministry will need to be able to provide rationale for the selected standard [where a maximum allowable coliform count is provided for worker safety]"; and "the daily sampling requirements, the provisions contained in explanatory note 16 from the existing Appendix 1 to Schedule 2 in the MSR should be added to the proposed tables 1 and 2."

**Response Form Question 12.7: Do you have any comments regarding whether residual chlorine monitoring should be required for any or all types of uses (e.g., only type 2 uses, type 2 and 3 uses, all uses except type 1 and 4)?**

Respondents commenting on this topic noted that residual chlorine monitoring is "easiest way to determining treatment effectiveness and water safety" and "is reasonable for all residential reuses – but not for direct irrigation purposes." One respondent felt that this is "potentially a very onerous requirement creating a further barrier for direct implementation of reclaimed water systems" while another commented that "residual chlorine monitoring can be very difficult to maintain, so the requirement for online residual monitoring should depend upon the degree of risk or extent of the application in question." Several respondents felt that chlorine residual monitoring is appropriate for "type 2" discharges but "not for type 3 and 4" with specific comments such as "high exposure types of uses should include on-line residual chlorine measurement" and "this is certainly appropriate for type 2 to combat bacterial growth during storage or within the distribution system."

**Response Form Question 12.8: Do you support the suggestion that the ministry allow for testing during the weekdays by reducing the time in note 11 in Appendix 1 of Schedule 2 for the median value from "the last 7 days" to "the last 5 days"?**

Most respondents who commented on this topic supported the ministry's intention while some expressed disagreement. Specific comments included: "if the sampling requirement is daily, then you need surveillance daily"; "the costs of sampling and analysis on weekends can be unnecessarily expensive"; [our organization] supports this suggestion when it can be demonstrated that operations during the weekdays are reflective of the weekends"; and "the professional should determine an appropriate monitoring plan."

**Response Form Question 12.9: Do you agree with the suggestion that note 16 in Appendix 1 of Schedule 2 be amended to allow for two consecutive daily presence tests to give the**

**operator time to determine if the first positive result is a false positive or is in fact an indication the system is failing (giving the operator time to correct the problem)?**

Overall most respondents supported the ministry's intention while a few respondents disagreed. Specific comments included: "if the results differ from the first and the second test, then a third test should be run"; "equipment failures and sample contamination are relatively frequent and operation staff needs time to determine the source of the problem and confirm the system is in fact contaminated;" and "the degree of concern could be influenced by the bacterial count detected as well as other poor water quality parameters present."

**Response Form Question 12.10: Do you have any additional comments or suggestions related to the ministry's intentions to reorganize Schedule 2 of the regulation?**

Specific comments received in response to this question included:

- ◆ "[Our organization] recommends against being overly prescriptive so as to allow for the exercising of professional judgment – for example, while notwithstanding the director's authority to make the final decision, the professional should be allowed to apply for a variance or alternate standard";
- ◆ "Forest fire suppression/protection may have a higher exposure level than stated in Table 2, Type 4 (low exposure level) in an urban [interface] forest fire"; and
- ◆ "Table 2 of the Policy Intentions Paper states that the treatment requirement for 'Type 2 'Highest Exposure' is 'virus removal via coagulation and filtration' – this should include 'or equivalent,' as we would not rely on coagulation and filtration for virus removal."

## **B. Toxicity standards by type**

**Response Form Question 12.11: Do you have any comments regarding the ministry's intention to require toxicity testing for reclaimed water uses that impact aquatic environments and/or suggestions for the ministry in establishing effective and practical testing standards (e.g., provisions for site-specific sensitive species and sensitive life stage toxicity testing)?**

Comments received in response to this question were split – some agreed and others disagreed with this intention. Specific comments or recommendations included: "there is a very extensive data base available which identifies test species and test requirements for WWTP effluents"; "if treatment levels exceed minimum requirements and verification [is] provided [that] the fish can live in the effluent at a high LC value, then further testing not required"; and "notwithstanding the director's authority to make the final decision, the professional should be allowed to apply for a variance or alternate standard."

One respondent cautioned the ministry to "please keep in mind that the 96hLC50 test is seriously flawed and [can] lead to false failures. The addition of oxygen in the sample increases the sample pH, shifting the ammonia species balance from non-toxic from to the more toxic

form. At this point the sample no longer reflects what was really discharged, is more toxic, resulting in a failed test. There has to be an allowance in the test for pH stabilization through the addition of carbon dioxide gas.”

### C. Standards and requirements for fecal coliform (versus *E. coli*) monitoring by type

*Response Form Question 12.12: Do you have any comments or recommendations regarding standards and monitoring requirements for fecal coliform and/or E. coli in the regulation? For example, would you recommend that the regulation set fecal coliform standards and require an additional E. coli standard for specific applications such as spray irrigation of reclaimed water for food crops?*

Divergent responses were received to this question. Several respondents supported the use of both parameters, commenting, for example, that this “would be a reasonable measure”. Others stated that “either is valid in wastewater [as] both [are] gross indicators.” One respondent suggested that “as an indicator, FC works effectively – in the event of a failed test, require retest plus *E. coli*, and move from there” while another commented that “as *E. coli* are predominantly present in the guts of warm blooded animals and not generally associated with decaying vegetable matter, it is a better indicator test for fecal contamination.”

Additional specific comments included:

- ◆ “[Our organization] recommends setting a standard for one or the other, but not both and preferably fecal coliforms as it is more sensitive (i.e. fecal coliforms are typically present in much greater numbers than *E.coli* in wastewater)”;
- ◆ “*E. coli* monitoring is a more common practice versus fecal coli form – there is limited benefit in monitoring both and communities should be able to select on basis of available lab monitoring equipment”; and
- ◆ “*E. coli* is the proper indicator for freshwater environment but enterococci is the better indicator for a salt or brackish water environment – [a community/facility] should clarify the indicator and standard based on the receiving environment characteristic.”

### D. Stream augmentation

*Response Form Question 12.13: Do you have any comments regarding the ministry’s intention to establish standard requirements and the ability of the director to set site-specific requirements for uses of reclaimed water (such as stream augmentation) that would better protect aquatic life, ground water or other water resources?*

Overall there was agreement with this policy intention. Several respondents referred to their responses to other questions, commenting, for example, the “the Director [should] be able to set site-specific standards based on professional advice”; “these [should] be science based requirements”; “this is already addressed in the environmental impact studies and should not be duplicated”; and “discharges should all be handled in the same manner (EIS to establish site

specific requirements) ... stream augmentation should be considered as low dilution discharge – reuse should be distinguished from discharge as it should replace another water source.”

### **E. Irrigation and varying treatment reliability**

*Response Form Question 12.14: Do you have any comments regarding the ministry’s intention to differentiate irrigation applications on the basis of potential for (public and worker) exposure and categorize them accordingly?*

Several respondents commented that “differentiation appears to be reasonable.” One respondent noted that “Table 2 includes some subjective qualifiers and it would be important to know how they are defined” and other supported the intention “as long as there is appropriate flexibility for site and project specific conditions.” One respondent raised two specific comments: 1) “the requirement for ‘daily’ testing [for Type 2 Use] seems impractical, particularly for reuse locations where transportation of samples to an accredited laboratory would be challenging and cost prohibitive on weekends and holidays”; and 2) “it is our experience ... that the local Fire Marshal has jurisdiction over the reuse of effluent and efforts to use effluent for fire suppression even just at the WWTPs consistently get rejected by the Fire Marshal.”

*Response Form Question 12.15: Do you have any comments regarding the ministry’s intention to continue to require “category 1” system reliability (Schedule 7, 2(1)(6)(a)) for reclaimed water uses (such as for irrigation of golf courses)?*

Respondents differed in their responses to this question. Some respondents expressed agreement with the fundamental requirements for the Category 1 redundancy provisions while others felt that “this is an excessive requirement in cases where other factors mitigate the overall risk.” Respondents commented that the regulation should provide or support “the opportunity for risk mitigation” and the “emphasis [of regulatory provisions] should be on reducing risk to the environment and public health to a reasonably low level.” Several respondents noted that the regulation should “allow for flexibility” with the ministry able to “use the powers [of the ministry] to enforce, or approach the owner or QP to verify or comply.” One respondent recommended that the regulation be updated to incorporate more recent technologies and retain the ability to incorporate or support emerging or new technologies.

### **F. Shallow sub-surface irrigation**

*Response Form Question 12.16: Do you have any comments or suggestions for the ministry regarding appropriate and effective regulatory requirements for sub-surface irrigation use of reclaimed water?*

Respondents who commented on this topic generally agreed with the inclusion of shallow sub-surface irrigation in the regulation. Specific comments included: “this is a hybrid between reuse and discharge ... allow flexibility for year round discharge with properly designed systems and

reduce the ground water separation”; “apply similar standards as for drip irrigation applications”; and “sub-surface irrigation must include properly designed discharge – especially in poor draining soils containing clay – several temporary discharges of camp type operations use this type of discharge – in discussion with these operators it was found the soils in various areas within the province readily plug resulting in pooling of water around the discharge ... for more permanent installations, this is not acceptable and surface pooling of treated wastewater represents a high risk for pathogen contact.”

**Response Form Question 12.17: Should sub-surface irrigation requirements be included in Schedule 4 and not in the reclaimed water section as it could be considered disposal to ground?**

Several respondents noted that sub-surface irrigation is a “hybrid” of “disposal to ground” and “reuse of reclaimed water” and attempting to categorize this type of use as one or the other in the regulation may be problematic. Specific comments on this topic included:

- ◆ “Sub-surface irrigation ... is used for green roof and indoor plant irrigation, golf course greens, turf, and landscape irrigation ... it should be left in the reclaimed water section”;
- ◆ “Sub-surface irrigation requirements should be included in Schedule 4 – Schedule 4, Table 4 should be based on soil infiltration loading rates (Litre/m<sup>2</sup>/day) based on soil morphology evaluations and class of effluent being discharged to the soil”;
- ◆ “In-ground distribution systems that are more specifically designed to take into account the evapo-transpiration aspects of plants have been utilized for decades. All properly design[ed] onsite wastewater systems take into account shallow bury principles without which the system will not have a suitable usable lifespan – drip emitter techniques, for example, typically require effluent of BOD 30 TSS 30 or less to prevent emitter clogging and therefore the technology use drives the need for high quality effluent discharge that meets the reclaimed standards. As for fecal coliforms in soil discharge systems this is simply not an issue. Soil biology and soil particle environment present an environment where it is difficult for pathogens to exist due to competition (i.e., the biology controls the biology)”;
- ◆ “Subsurface lines must be located under the frost line to prevent freezing – use of heat tracing to allow more shallow bury should be frowned on as the heat trace is vulnerable to damage and would not provide the level of reliability required for this application.”

### 13. Protection of human health and the environment

*Response Form Question 13.1: Are there any aspects of municipal sewage management and the use of reclaimed water that could significantly affect human health or the environment that are not, in your view, sufficiently addressed in the ministry's intentions and proposed amendments to the Municipal Sewage Regulation? What, if any, are they? What suggestions do you have for the ministry to improve the manner in which these concerns are addressed?*

A number of respondents provided additional suggestions, including the following examples:

- ◆ “The proposed revisions mean that the MSR will continue to be a major impediment to the principles of IRR espoused by the Province ... there should be a requirement that every registration include a narrative on resource utilization and recovery for the project (including, for example, comparative energy efficiency) and a rationale [addressing] ... IRR principles ... this would at least ensure that these issues are considered”;
- ◆ “Risk mitigation and multiple safety factors need to be considered in any application for registration, to provide a net benefit reducing other discharge criteria”;
- ◆ “Replace absolute limits with limits based on a statistical averaging methodology, where appropriate”;
- ◆ “Although every intention is made to protect the public, however I believe it will be difficult to address all of the health risk because reclaim water quality can change without notice – the ministry or government will have to assume there will be some risks”;
- ◆ “The terms human health and public health are both used interchangeably in the MSR – revise to say human health, this includes worker health”; and
- ◆ “The focus of the reclaimed water provisions in the MSR seems to limit reuse rather than to encourage it – by encouraging innovation, the environment, social, and economic fabric of the province may be well served in the long term.”

*Response Form Question 13.2: Do you have any other comments or suggestions for the ministry regarding the regulation of municipal sewage?*

A number of respondents commented that the ministry intentions paper and the MSR do not give sufficient attention to, or encouragement of, energy recovery from sewage. One respondent, for example, noted that “while the MSR may not be the tool to regulate energy recovery facilities that doesn't mean it shouldn't include a section encouraging the practise as a desirable goal for wastewater management in the future.”

Several respondents raised concerns that the ministry's intentions for addressing “use of reclaimed water” in the regulation implies risks and undue or “onerous” requirements on reclaimed water applications relative to those associated with “conventional disposal” of municipal sewage. One respondent commented that this “fundamental problem with the

structure of the MSR ... powerfully forces big pipe, surface water discharge solutions that may in fact have greater overall environmental impacts." A number of respondents referred to the details of regulations and guidelines that have been developed for different types of wastewater reuse or reclamation. For example, one respondent noted that "twenty-eight states [who] have adopted regulations on the unrestricted reclamation/ruse of wastewater" and included tables of these regulations with their submission.

Additional specific comments included:

- ◆ "The MSR continues to try to shoe-horn complex questions of sewage treatment into cookbook categories and therefore avoid the need for professional judgement and the exercise of discretion by the Director. This is not practical. The issues are too complex to avoid facing this complexity. The Director should be open to submission of formal risk assessments following accepted methodologies, prepared by qualified professionals, Further, the Director should be supported with a third party of "rostered professionals" in a Technical Review Committee (TRC) who can advise him as to the level of risk entailed with any particular application, including treatment system risk, exposure risk, receiving environment risks and other environmental risks";
- ◆ "Shift from WWTP to WERC (water and energy recovery centre) design concept ... eliminate concept of disposal of treated water - 19/20<sup>th</sup> century concepts of 'wastewater' ... [in design] model full spectrum of objectives (water and energy recovery, PCPP treatment, nutrient loading and creeping dead zones, total reduction in grid energy consumption, future proofing of water supply system given GHG and CC issues, etc.) ... address issue of Phosphorus sequestering from sewage effluent streams ... adopt the use of 'pilot programs' to provide innovation in design to adopted within acceptable time frames ... a performance-based model [rather than a prescriptive approach] would provide real options for innovation";
- ◆ "This review should be done considering the comments provided in the recent draft for consultation 'Canadian Guidelines for Household Reclaimed Water for use in Toilet and Urinal Flushing' by Health Canada - many of the same issues are covered in more detail";
- ◆ "[The regulation needs to be simplified and] support water conservation by encouraging reuse rather than adding requirements to reclaimed water systems that make it more costly to reuse than to discharge to water or land";
- ◆ "Since [there are] a wide array of facilities with varying organisational and operational capabilities it is important that you keep the small, low ability facilities (like small scale food processors) in mind ... where possible add provisions that define levels of requirements dependant on scale of discharge - consider the cost and complexity of the regulations on the industry and the public, particularly in remote and rural areas"; and
- ◆ "The MSR needs to read more like a standard ... things that are directly related to each other should be as close together as possible and as much as possible the standards need to be presented in tables with the simplest clearest language possible."

## Appendix A: Acronyms and Abbreviations

<b>Acronym or Abbreviation</b>	<b>Definition</b>
96hLC50	96 hour acute toxicity (test)
AO	Advanced oxygenation
ASTTBC	Applied Science Technologists & Technicians of BC
AWWA	American Water Works Association
B.C.	British Columbia
BOD	Biochemical oxygen demand
CCME	Canadian Council of Ministers of the Environment
CFU	Colony-forming unit
CSA	Canadian Standards Association
<i>E. coli</i>	<i>Escherichia coli</i> (bacteria)
EIS	Environmental Impact Study
EOCP	Environmental Operators Certificate Program
FC	Fecal Coliforms
GHGs	Greenhouse Gases
HVAC	Heating, ventilation and air conditioning
IRM	Integrated Resource Management
IRR	Integrated Resource Recovery
LWMP	Liquid Waste Management Plan
m <sup>2</sup>	square metres
MBR+AO	Membrane bioreactor plus advanced oxygenation
MFT	Membrane Filtration Technique
mg/L	milligrams per litre
mL	millilitre
MOE	BC Ministry of Environment
MOH	BC Ministry of Healthy Living and Sport
MSR	Municipal Sewage Regulation
MPN	Most Probable Number Method
MTF	Multiple Tube Fermentation
O & M	Operation and Management
OMRR	Organic Matter Recycling Regulation
OP	Operating Plan

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<b>Acronym or Abbreviation</b>	<b>Definition</b>
P3	Private public partnership
pH	potential of Hydrogen (measure of acidity or alkalinity of a solution)
QP	Qualified Professional
RAR	Riparian Area Regulation
SSBC	Shared Services British Columbia
SSR	Sewerage System Regulation
TRC (1)	total residual chlorine
TRC (2)	Technical Review Committee
TSS	total suspended solids
USEPA	US Environmental Protection Agency
UV	Ultraviolet
WERC	Water and energy recovery centre
WHO	World Health Organization
WW	Wastewater
WWTP	Wastewater Treatment Plant