

Technical Advisory Panel Meeting
April 16, 2008
9:00 am – 3:30 pm

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Welcome and Introductions

Angie Thomson, EnviroIssues, welcomed everyone and introductions were made. Angie reviewed the agenda items. Eugene Radcliff, Washington State Department of Ecology (Ecology), asked if everyone has been able to access the sharepoint website. There were a few members that had not tried to get onto the site yet. Eugene reviewed the sharepoint website developed for the Technical Advisory Panel (TAP) and demonstrated how to set up alerts when new content has been added. Each user can choose to have daily, weekly or monthly updates. Kathy Cupps, Ecology, added that users can choose what to be alerted about; you can choose to be updated when any change has been made or you can be updated daily or weekly with a summary of changes. Kathy asked everyone to let Eugene know if there are issues with the site and said if the system does not work they will revert back to email.

Questions/Comments:

- *Does the site store emails the group sends to each other?* Eugene said the site does not store emails but each user can set up a discussion page where the group can track conversations on a particular issue.
- *Are the discussions set up by topic or by meeting?* Eugene said currently the discussions are not tied to the meetings. Eugene volunteered to change the site to meet the needs of the group. Jim McCauley, Ecology, suggested keeping discussions under the meeting tabs.
- *Can any user set up a new discussion topic?* Eugene said he was not sure if it was set up that way now, but would figure out how to allow users to add documents and start new discussion topics.
- Angie asked how the site was working for the people who have used it. Jay Swift said it was easy. Kathy said she would like the panel to use this website instead of emails so that conversations are documented; she encouraged members to set up reminders to keep up to date on topics.

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- Jay thought that it might be useful to set expectations for panel member participation on the site. Jay thought daily participation was excessive, but weekly would be adequate.
- Angie said the intent was to allow a trial period for the website, but since people have not used it much yet, Angie suggested waiting until the next meeting to determine if the site is useful.

Goal #1 Prepare recommendations for RAC consideration related to source water

Topic #1: Industrial Pre-Treatment

Kathy distributed handouts and reviewed the options considered by the TAP during the last meeting. She summarized the advantages and disadvantages for each option and read the proposed recommendations. Kathy said she would like to present this information to the reclaimed water Rule Advisory Committee (RAC) next week.

Questions/Comments:

- Craig Riley, Department of Health (DOH) said the premise in the existing standards was to ensure there would not be harm through contact in the collection system or in the wastewater effluent. The options for source control for reclaimed water may go through the system. Kathy thought the regulations for pretreatment covers pass through and interference. Ken Butti said the National Pollution Discharge Elimination System (NPDES) language and the general pretreatment regulations address byproducts, worker safety, and interference with the collection system. Kathy said the recommendation basically says to be consistent and to consider different size facilities and levels of requirements with respect to user surveys. Kathy reviewed Appendix A in the handout which covered existing regulations and prohibitions.
- Craig thought the language in the recommendation should be expanded to emphasize protection of the public. Linda McPherson noted that the public goes on tours of treatment plants, the plant is not in compliance until the end of the treatment train but they do not have to disclose this issue to people. Kathy explained that there are standard conditions that go into all the permits and it would be helpful if those all stayed the same. She said if there are additional things that need to be added they could be separated out and included in the optional requirements on page four of the handout.
- Dale Richwine said the Clean Water Act classifies a significant industrial user (SIU) as facilities above five million gallons per day (mgd). If a facility is under that amount, they do not have to do a user survey unless you have an industrial user contributing to the facility. Dale said he would like to see a survey required even for the smaller users. Ken agreed the current requirements Ecology uses when a facility is looking at reclaimed water may need to be strengthened to address source control.
- Craig thought a survey would have to specifically require improvements if a facility has SIUs. Craig said he has seen cases where a facility will do a survey but will not

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resolve the issues identified with total dissolved solids (TDS) pass-through because they are not specifically required to in the regulation. Ken asked if the current pass-through prohibition addresses the scenario of TDS going to the environment. Craig said he did not think the current regulations prevented this and that if the survey finds something the regulation needs to specifically say it should be resolved. Kathy thought the permit would do that whether it was the state or a delegated program.

- Linda said from a public perspective it is better to have a regulated program in place because writing a permit that goes to the industrial user is not seen as an adequate barrier. Linda said it sounds like the permits are currently issued on a case by case basis based on what is found in the industrial survey. This process may not be viewed as legitimate to the public. Jim warned against setting a double standard for reclaimed water that regulators would not set for a treatment plant.
- Craig thought it was important to differentiate reclaimed water standards from wastewater standards. Craig said the example he provided was from the city of Quincy and highlight issues specific to wastewater effluent. Craig said cities like Quincy will go out of their way to attract facilities like Yahoo and Google even though they may pose a significant permit issue. James Hagstrom thought it was fine if the city wants to accept the users, but said if the city wants to produce reclaimed water they will have to pay to deal with any contamination the users cause. Ken said currently there are no standards to cover a small municipality that decides to produce reclaimed water. Ken suggested considering a rule that requires all reclaimed water facilities to include some type of pretreatment process. Bill Persich agreed but said placing the burden of pretreatment on the publicly owned treatment works (POTW) would cost more overall. Craig said he is advocating for an acknowledgement from the POTW that they will deal with industrial users.
- Jay argued that local limits can be used where there are SIUs, otherwise best management practices should be the standard. Kathy explained that generally the state determines the program, but there are partially delegated programs where Ecology issues permits to industrial users and also conducts industrial surveys or inspections. Craig felt that if the rule is created with use based standards then the state needs a way to deal with the potential contaminants.
- *What is the drawback to requiring a pretreatment program?* Linda said Ecology could leave it up to a POTW whether to do the pretreatment themselves or require the industry to pretreat the effluent. Craig explained that in Quincy there was an existing discharge, TDS is an issue for the discharge permit but is not an issue under existing source control because TDS does not harm anyone. Kathy elaborated on the current practices; she said if you want to reclaim the water the city or facility has to meet the requirement. If they are not meeting the requirement they have to include pretreatment facilities by either providing a facility themselves or requiring the industry to do so. Craig said the risk is that because of political reasons, the pretreatment requirements will not be imposed. The prohibitions are not tight enough to go to the reclamation end point and are not transparent enough for everyone in the public to understand the process.

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- Kathy said the recommendation on page two of the handout says to be consistent with current standards. Kathy suggested adding an additional recommendation for further requirements to make sure the treatment is suitable for the use: “Add additional pretreatment requirements when necessary to protect the end use.”
- Larry Esvelt said he would like to stay away from imposing additional delegation requirements on small municipalities because it could become a barrier to reclaimed water use. Kathy asked if it would help to be more specific about additional requirements. Ken suggested any time a municipality decides to produce reclaimed water it should trigger an inspection or survey to make sure there are no potential groundwater quality or other impacts. Kathy asked if this would put Ecology in the position of making the decision for a city instead of letting them decide. Bill suggested giving a city the choice, if they cannot do the pretreatment themselves they should be able to require industries to do it. James thought that cities have the ammunition to do this currently but do not have the political will to do it. Ultimately the city is responsible for meeting the regulations and if it is more efficient to do that through pretreatment or POTW then they should be able to do that.
- *What if a city decides to move away from reclaimed water because they favor the industrial user over producing reclaimed water?* Ken said Ecology could determine that the new user would make the groundwater discharge unacceptable and they would have to find a new discharge site. Bill said in the cases like Quincy, the city would have a hard time finding another surface discharge option. Linda said the panel has expressed an interest in allowing the POTW flexibility to do what is best for them but this may create a situation where POTWs do not have the clout to require an industry to pretreat. This situation could force all the other users’ rates to increase. Including a pretreatment option in the rule may result in the loss of a reclaimed water producing facility because the POTW have no recourse. Linda felt that this is why Ecology should require the industries to provide pretreatment. Walt Canter agreed there is a conflict between the end use versus economic development. Kathy suggested adding another recommendation to address the industrial pretreatment issues.
- *How is “significant” defined in the fifth bullet under language for the rule?* Ken said the SIU definition includes a categorical industry, a certain flow, or any other industry that could have an impact on the plant. Dale thought this should just say SIU so it is not left to interpretation. Kathy agreed with that change.
- Craig said a lot of the standards currently being used are only for wastewater and therefore the details break down when applied to reclaimed water. James said when a facility starts producing a product (biosolids or effluent), the city decides what to accept from an industry; the same is true for reclaimed water, the city can decide what they accept and can change industrial requirements because of the change in product. Craig said the way it works today, the process gets bottlenecked in wastewater issues. Craig reiterated the importance of keeping reclaimed water separate from wastewater. Bill suggested adding the statement “necessary to protect the end use” onto the end of bullet five. Kathy suggested adding that language to bullet five and six. Angie asked panel members if they supported this change; panel members all showed support for the addition.

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- Jay thought that it would be inappropriate to notify Ecology anytime an SIU connects as recommended in bullet five. Ken suggested instead of saying notify Ecology, it should say “the permittee should have in place an ongoing industrial survey effort and notify Ecology when a SIU proposes to connect to the system.” Panel members supported this change as well.
- Kathy asked if panel members wanted to keep the statement in italics on bullet five. Panel members supported keeping the italicized portion of bullet five.
- Bill thought the second sentence in bullet five restated bullet six. Kathy clarified that this sentence refers to the reclamation permit. Craig asked to make the statement more specific and qualify the type of permit. Panel members agreed with adding the word reclamation before permit in the second sentence of bullet five.
- *How does the state program work for non-delegated programs where not everyone has a sewer ordinance?* Kathy said Ecology can require that as a part of the permit when appropriate. Kathy added that a facility has to have the capacity to do a delegated program.
- Craig noted that everybody on the panel understands the difference between wastewater and reclaimed water, but there are still people who do not understand the difference. Kathy agreed and said the panel should be careful about what is put in regulation versus guidance.
- Angie explained that the first and second pages of the handout will go to RAC next week. Angie said there will be five recommendations and the panel will need to continue to refine the additional one.

Topic #2: Type of Source Water

Kathy said the second issue addresses whether or not the panel is concerned about the type of source water. Kathy summarized the four options and the advantages and disadvantages. Kathy reviewed the recommendations made by TAP during the last meeting. Angie added that the panel voted in support of recommendations 1, 2 and 4 on the second page of the handout during the last meeting. Kathy said the panel discussed the third topic during the last meeting but did not vote on the topic.

Questions/Comments:

- Frank Loge said he is an advocate of developing water quality based standards independent of source water because it leaves it up to engineers to develop the technologies.
- Linda asked if the advantages and disadvantages portion of the handout will go to RAC. Kathy said it would. Linda asked to change language in the second option to take out the “yuck factor”, and say “public perception issues related to” instead. Panel members agreed with this change. Linda also thought the third option should be changed to say treated wastewater discharge, not wastewater discharge.
- *Does the third recommendation say that all known, available, and reasonable technologies (AKART) is a secondary standard?* Kathy said it is for a municipal

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facility. Jay asked if this also includes industrial pretreatment. Kathy said it does not; it is for the reclamation facility. Kathy explained that regardless of use, Ecology requires the facility to meet state standards for the type of wastewater they are receiving.

- *Is there a low level water that can be irrigated?* Kathy said Washington does not currently have that, but Oregon does. Kathy said if Washington wanted to do that AKART would have to be defined for an on-site system. Dale asked if this recommendation would take away the option of low level irrigation. Kathy said it would not; non-contact cooling water is not secondary treatment. Ken asked if AKART would cover that. Kathy said it would; it would give consistency in a basic recommendation.
- Jay said AKART is for secondary treatment and may become less appropriate for reclaimed water uses because of the nutrient removal requirements. Larry asked if AKART is specific or generic. Kathy said it is specific for POTWs treating sewage. Ecology requires AKART as a minimum standard for wastewater regardless of the receiving water quality. AKART is an economically feasible level of treatment. The nutrient removal requirements would be water quality based requirements. Frank added the spirit of AKART is general for a reclamation purpose and thought it would be nice to put something specific in writing regarding reclamation and refer to AKART as backup.
- Larry thought that AKART is already being misused for development of particular discharge requirements. Larry also thought AKART for reuse water may be different than for reclamation. Frank agreed AKART is ambiguous and open to interpretation for permit writers. Kathy felt there is confusion with the term AKART. AKART is a treatment standard minimum for a category of facility. Kathy said it is totally irrelevant where the water is going and is a misinterpretation of the standards. Kathy said the language could be removed or AKART could be defined to make it clear. Kathy said AKART has been defined for municipal wastewater sources but only certain industrial AKART standards have been defined, most are case by case. Ken thought that AKART needs to be defined for the application.
- Larry said AKART is being applied differently than the definition Kathy provided and thought AKART should be avoided in the panel's recommendation. Ken suggested taking out the third recommendation and including it in the fourth to allow flexibility for special situations including AKART. Craig thought all references to AKART should be dropped from the recommendation; others agreed.
- *If the log removal requirement assumes the source water is wastewater, are the water quality standards dependent on the source water?* Frank said the log removal was based on unrestricted use. James said he does not disagree with establishing water quality rules based on an intended use, but said if the standards assume secondary effluent then the industrial source water will need to be brought up to that standard. Craig said that is why Kathy is proposing AKART. Craig said he would like to propose doing the same thing but avoid the term AKART. Kathy proposed saying "minimum amount of technology treatment." The panel supported this language change.

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- Bill said the majority of applications are municipal and only a handful of industrial streams will qualify. Bill suggested using AKART for municipal and allowing the flexibility for the other sources case by case. Kathy said the panel talked about that last time and everyone felt the standards should be consistent.
- Walt said in order to sell it to RAC the panel needs to simplify the recommendation into source, treatment, and use so the RAC can follow a chronological path to see how the panel came to a decision. Frank said he does not disagree with Walt's comment but is concerned that if the standards are set up chronologically to go from source, to treatment, to end use it will result in a treatment technology requirement for each source and intended use which will not allow flexibility for the design engineer.
- James said you cannot have a water quality based rule unless you know the quality of the source. If the panel bases the rules on effluent water quality, that effluent water quality should be based on the source being secondary effluent or some other quality. The log removal requirement does not work unless the source is the same. Frank said this is largely what is already done with drinking water; the standards are set on the health of the water. James said he thought this was not true for pathogens. Frank said this debate gets to the issue of how much is understood in terms of minimum water quality requirements to ensure the health of the quality of the water. Frank said it is important to understand that there is a balance between what is understood and what is not understood. Craig said DOH uses performance based standards because they cannot measure the threats. The treatment techniques are applied where there are health parameters that are known but cannot be measured. Linda said just because we can find it does not mean we should regulate for it. There are things that are known to be contaminants that the Environmental Protection Agency (EPA) does not regulate for. Linda suggesting rewriting the first recommendation to focus on water quality suitability for the use - not where the water has been.
- James thought the rules the panel creates should be consistent between industrial systems and POTWs. Frank agreed and said the panel should be careful in defining what is a water quality standard versus a treatment standard. Water quality is a concentration that is acceptable, log removal is a treatment standard.
- Kathy said it sounds like the panel is not ready to make a recommendation on this topic. James suggested moving on to the next topic and coming back to this issue. Kathy said she will bring this back as a draft for the panel to revisit in the future. Kathy said she will provide the RAC a summary of the issues the panel is working on and will let them know this will come back to them after TAP looks at standards in more detail.

Goal #2 Water Quality related to Pathogens

Jim McCauley, Ecology, reviewed the handout on pathogen removal standards. He said the first portion of the handout attempts to capture the issues brought up during the last TAP meeting. Jim summarized the four options considered by the panel for inclusion in the rule.

Questions/Comments:

- Linda asked if instead of starting with a log removal the panel could come up with a standard for the end water that includes an absolute number. Bill said that approach would require monitoring to ensure the standards are being met.
- Jay said option two was not meant to be a flexible log removal approach but to establish a specific log removal throughout the treatment train as applied to municipal wastewater. In this option, rather than a five log removal requirement after secondary, it would be maybe six across the whole train.
- *Where did the five log removal guideline come from?* Frank said the five log removal was based on the Pomona virus study. Collectively, between the tertiary treatment and disinfection systems the study demonstrated a five log removal of viruses and from that refined the log removal rate; one log in filtration and four in the disinfection system. The data showed a five log removal of polio virus across the effluent that was generated from a secondary treatment process. Frank said this is not a health based standard, it is a treatment based standard.
- *Have California and other states looked at how a five log removal translates to health risks?* Frank said these standards started off as a treatment based requirement, anything more was not part of the original study. No one has done a study to confirm the linkage of a five log removal and the risk of illness. Frank said the Pomona virus study resulted in treatment based criteria which was a five log removal. Frank said when this panel begins to understand the epidemiology study and translate that into water quality standards it will reflect the interpretation of the Pomona study. If the panel chooses to develop water quality standards, it is important to articulate the logic in those standards because none of the previous work has done that. James said he was not sure the panel has the technical expertise to recommend a requirement since there is no data to substantiate the recommendations.
- Jim outlined three possible methods for regulating reclaimed water: 1) specify the treatment processes 2) use some sort of log reduction of certain pathogens or 3) specify a certain concentration of the final product. Frank suggested adding a fourth option to include a standard based on indicator organisms that follow the model of epidemiology studies and linkages of health outcomes from water quality. Frank thought those studies have some scientific basis and grounding. Frank added the treatment technique is recognition that the general scientific knowledge does not provide enough information to understand these processes.
- Bill said drinking water standards specify treatment for specific organisms. If the panel pursues criteria for organisms, any protections in drinking water can be tossed out because of a multiple barrier approach. Dale agreed and said the epidemiology study done in Chicago in the 1850s is what started wastewater treatment; standards were set and the risk to public health was minimized. There are standards that have been set in California and Florida and experience has shown that those standards protect public health. Dale thought the panel could make a case that experience has proven the protection of public health. Dale thought that experience has shown that

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the combination of turbidity and coliform works. Craig said no one understood the turbidity requirements when it started; it is based on the requirements to assure a log removal.

- Kathy suggested the easiest solution is to take what has already been done in another state and apply it to Washington.
- Dale said as a former plant operator the possibility of having to use a test that requires 24 hours to get the results is worrisome because if the levels report high, water would still have been going out of the plant while waiting for the results. Dale said a system should be chosen that can be tested continuously. James said an operator could measure turbidity and particles and assume the log removal. Dale reiterated the importance of having a low-power reliable test.
- Frank said the vast majority of standards and guidelines developed to date are based on a groups' experience with what has worked and what has not worked, dependent on whether people got sick and what types of monitoring worked. The standards in place are not based on a health based perspective that DOH would nod their head at. The standards were developed by a bunch of people sitting around and determining what is the best that can be done. There will not be a lot the panel can point to as evidence, so panel members will need to rely on their own experiences.

Jim outlined the four options presented so far and asked if there is any combination of the options that could be agreeable to the panel:

1. Based on use, specify a given log removal
 2. Based on use, specify a given treatment technology
 3. Specify a given concentration in the final product
 4. Base treatment technique on indicator organisms
- Linda thought a combination of option three and option two might be acceptable; others agreed.
 - Bill thought option one could be viable not as a mathematical requirement but as an indicator of good treatment. James agreed and said option one provides the flexibility to react the way industry reacts. California has led the way in terms of membranes and demonstrated log removal; it gives engineers the ability to demonstrate log removal through treatment trains.
 - James said there is a concern regarding multiple barriers because someone could argue a membrane bioreactor (MBR) provides a five log removal by itself. Craig said MBRs are getting zero virus removal credit but the difference in treatment approach is based on the clarity of water. James said that is based on not giving credit for log removal but disinfection efficiency.
 - Linda suggested discussing the quality of water along terms of use. Kathy said she previously attempted to present use-based water quality criteria to the RAC and got resistance because it put reclaimed water above drinking water which was something

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the group did not want to touch. Linda argued that the technology exists to treat reclaimed water above drinking water standards.

- *Has any state defined what water quality level is acceptable for reclaimed water?* Linda thought Title 22 includes water quality standards for all kinds of uses. James said the Title 22 parameters are used as surrogates for a five log removal. Craig said the Title 22 reports consider the water to be pathogen free at a five log removal. Frank said Title 22 is for unrestricted reuse.
- Kathy suggested listing the pros and cons of each option in order to understand them better. Linda said this seems like it will require an analysis of risk or safety and she did not feel she had the expertise to do that. Kathy said one of the disadvantages of some of these approaches is that this group is made up of experts and still is not sure how to create the standards needed for the rule.

Option #2: Based on use, specify given treatment technology(s)

Pros:

- could protect through multiple barriers
- easier to implement
- consistent with existing practices
- provides for regulatory consistency
- easy to understand
- sustainable

Cons:

- doesn't allow for changing technologies/efficiencies
- may not be water quality/health based
- may be inflexible
- public concern about operational upset
- public concern about new technologies
- public demand for highest treatment/technologies

Questions/Comments:

- *Is this option based on source water and possible use?* Jim said the existing standards are for multiple uses and outline a class for each use. Bill asked if municipal effluent versus feed lot effluent would use a different technology. Jim thought the discussion should be limited to classic municipal wastewater.
- Jim asked if the processes should be specified given the use. James thought this would be valuable for some users that may not want to spend the engineering dollars to come up with a solution. Dale said the 503 regulations for biosolids include specific technologies for Class A and B.
- *At what level would you classify contact water that is discharged into an aquifer?* Jim said if it was discharged through surface percolation it would be Class A; direct injection is also Class A but also requires reverse osmosis. Kathy added that it would be classified as restricted human contact.
- James asked if the panel thinks it is necessary to impose the same pathogen standards for groundwater discharge as there would be for fields where kids play if a facility

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has a trained operator that understands the risks. Kathy said Class A is used in parks, playground and for drinking water. James felt that multiple barriers should be used so a facility does not have to rely on a single point of failure. Jim asked if that would involve specifying barriers for each use. Jay did not think that specifying treatment technologies would require multiple barriers.

- Kathy said she has seen issues with a public works director questioning the chosen technology path when other cities are doing it differently. James said they ran into this issue in Carnation when the public questioned the use of MBR as the best available technology. Linda said there is a risk in specifying a technology because if the public knows there is a higher treatment method they will always want the highest treatment available regardless of the appropriateness for the use. Linda said this issue stems from the lack of communication with the public about how these systems work.
- Bill thought specifying treatment technologies must come with a caveat to specify methods and include minimal performance indicators. Dale said it should also include design criteria. Bill thought the title of option two should say: “Based on use, specify given treatment technology(s) in addition to basic performance standards.”
- James asked if all four options could be used. Emily Callaway thought some could be included in the rule and others in guidance.

Option #3: Specify a given concentration in the final water depending on use

Pros:

- flexibility for designer
- calming for public
- independent of source
- water quality & health protection based
- if successfully implemented, gold standard
- consistent with drinking water quality approach

Cons:

- expensive and technically challenging to measure
- defining what is acceptable water for use in terms of constituents
- time lag in test results
- added cost to create a space to hold the water until you deal with time delay
- lack of good labs/indicators

Questions/Comments:

- James asked Frank if he has seen any literature that defines water quality parameters for safe uses. Frank said one primary body of literature to draw from is the Recreational Water Quality list serve which develops relationships between indicator organisms and health outcomes. Frank said there is also a set of risk assessment literature that develops relationships between specific pathogens and illness that is focused on exposure through water or other liquids.
- Craig thought the option should address what is safe and said some attorneys say there is no such thing as safe drinking water. Linda said that is because attorneys look at the issue in terms of levels of risk, and the public thinks in terms of safe and not

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safe. Kathy said that is why Ecology has said they will not permit reclaimed water unless they think it is safe.

- James said these options are not any different than drinking water and thought it was important to keep that perspective.

Option #4: Base treatment technique on indicator organism

Pros:

- easy to test
- representative of level of treatment
- representative of level of risk
- performance based

Cons:

- lack of representative indicators
- may need more than one indicator
- potential for re-growth
- point of compliance
- public perception of “finding” indicator organisms

Questions/Comments:

- James thought option four is imbedded in all the options and was not sure it stands alone. Others felt that none of the options could stand alone.
- Dale said one basis for selecting an indicator organism would be to pick the hardest one and assume you get the others with it. James said that is not how Title 22 is set up. Indicator organisms should be easy to test for and representative of level of treatment and risk.
- Craig said there is some research that shows total coliform can be detectable at less than one but still can contain significant pathogens. James argued the reason total coliform is used is because the labs are set up to test for it. James said in order to achieve the log removal, an indicator needs to be selected that is easy to test, not too costly, and reliable.
- Denise Lahmann said when coliform is used in drinking water standards it is used as an indicator to show the system has not been vulnerable to contamination. In this case it would be used in reverse to say the indicator is present before treatment and not present afterwards. James said one problem plants have had is that they cannot prove the UV system is working because too many pathogens have been removed, so another indicator may be needed. Craig said research has indicated surrogates are needed as well as indicator organisms because of regeneration in storage and distribution. Linda said using indicator organisms is scary to the public because you are identifying the “bad stuff” in the water but then say the water is okay because there is only a small amount of “bad stuff”. This is hard for the public to understand.
- Jim said Texas uses indicator organisms for water quality but does not specify a treatment process. One idea is to substitute the log removal concept for treatment technology. Frank said he agreed with this approach because the ultimate goal of the standards is health and safety of water but also to allow engineers the flexibility to do things that are creative. Frank said this approach would differentiate Washington from other states.

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- Larry said the panel should focus on how to achieve use based standards. Larry felt that log removal was the way to do this but said there is not a way to do that on a day to day basis; it can only be done through indicators that are reasonable and affordable. Larry said if the intent and issues are not framed well the regulation will wind up having the technology being determined by the indicators. Frank said three categories can be used to frame the issue: standards, monitoring and reliability. Larry added that the panel can craft the flexibility in the rule but allow the day to day operation to go back to monitoring, unless someone comes up with magic indicators.
- James outlined the three approaches he thought the panel was headed towards: 1) water quality, 2) technologies, or 3) demonstrate a suite of technologies that provide a specific log removal. Monitoring and compliance will be a part of all of them.
- James asked to return to the issue of why five log removal is the right number. Frank said five log removal is based on what was demonstrated as achievable in the Pomona study for a tertiary system at the end of a secondary system that had coagulated treated effluent. James said there is no scientific basis for the five log removal. Frank agreed there is no linkage between a five log removal and health risks/benefits associated with reclaimed water. Frank said the few studies that have done this with polio viruses have shown they do not have the same results so it is dependent on the wastewater. James thought that the influent has to start from a similar source. If a secondary system is not working well but a five log removal is achieved, the water produced will not be safe. James felt that requirements should be made for the treatment system leading into reclaimed water systems. Frank said the critical aspect to the approach is being able to look at what is present in the source water and the log removal you get with secondary treatment such that you end up with a concentration of pathogens in the effluent that is acceptable. This requires a determination of the absolute value in the final effluent that is acceptable.
- *Does Title 22 determine an absolute value for water quality acceptable to protect public health?* Frank said the Title 22 standards are based on the Pomona virus study. They looked at Pomona and then backed up and provided some sort of risk assessment, but there was no quantitative linkage between the two. Frank thought if this panel wanted to do the same thing then the linkage should be made explicit.
- Bill asked whether using a non-biological indicator like a particle count could be a viable option. Bill said a particle count could act as a metric to demonstrate good filtration. Craig asked how the regulators would require a small utility to make the expenditures to do this; this comes back to relating it to the public health risk.
- Linda asked if the recommendation from the panel is that the requirement should include all of the above. The strategy could say you can explore any of the options and document the methods. Pathogen removal within the reclaimed water rule should consist of pathogen removal, indicator organism monitoring, and the option of substituting log removal for treatment technology.
- Craig said maybe the panel should recommend to re-establish the Pomona virus study in Washington. Frank thought that could be the most beneficial thing the state of Washington could do for water quality. Kathy said it would not be possible to get the money to do the study given the funding and timeline Ecology has been given to

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create the rule. Jay thought that a consortium could conduct the study and the state of Washington would not need to solely fund the project. Frank agreed that the study would not need to be funded by the state, there are plenty of stakeholders that are interested in seeing the study conducted, the National Water Research Institute (NWRI) and consulting firms may be willing to provide funding.

- Dale said the log removal technologies will require more research to confirm an approach. Dale said as a technical panel, members can only work with the information available today and therefore the implementation has to use one or more indicator organisms.
- Frank suggested that the recommendation does not need to be immediately implementable; the panel could easily put forward a road map to put a standard in place. Denise thought the recommendation needs to acknowledge that there is not enough information to make a recommendation, but the knowledge in the field of drinking water leads to a certain approach. Frank said if the panel makes a recommendation, members need to decide if it will stand up in a court of law. If members of the panel do not feel comfortable saying that then the recommendation should not go forward.
- James said it seems like there is consensus that the rules should have options, there should be technology based options, and include the flexibility to move to a log removal process. The panel needs to do more work to flush out the details, but those three alternatives are ultimately where the panel is headed. Frank agreed and said he would like to add a provision in the recommendation that ensures that what is put in place will not end there. Kathy said sections of the regulation can be reserved for future addition and if that is something the panel would like to do they could include something in the rule to address that.
- Jay thought the panel should document gaps in knowledge that ultimately need to be filled and recommend additional investigation to establishing the standards. James thought that the proposed reclaimed water regulation would be an improvement from the existing standards. James said the panel should do as much as they can but know that everything is not possible.
- Kathy said Ecology has a legal deadline to adopt a rule, and if the panel and the RAC do nothing then the regulation will default to what is currently in place. Kathy said the regulations have to be based on the information available today. Sections in the rule can be reserved where additional information is needed. Larry said the panel should look to a specific recommendation regarding concerns about the public health consequences of the rule and the need for additional documentation.
- James thought if the rule includes flexibility it would be a big advancement to the existing regulations. James reiterated that the recommendation is to develop rules that include technology based, water quality and log removal based options to determine the technologies needed to meet the reclaimed water standards. Frank said it needs to include the log removal as well. James said drinking water would be a maximum contaminant level goal (MCLG) and the panel would have to come up with an indicator that would comply with that goal. Frank agreed that would be an advancement over what Washington currently has.

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- Linda said if you had a technology that was not already prescribed, you could use it under a removal train requirement. Kathy said this is kind of a chicken or egg concept and the regulation should be clear about what direction it goes.
- *Can log removal be demonstrated with an MBR?* James said if you are dealing with secondary effluent there should be a specific removal requirement. The current rules say coagulation, flocculation and filtration; the new regulation could provide a log removal requirement of one log, and then require disinfection. The process train could be four log and then you could define the treatment requirements for each process. If you have a technology that could provide the log removal, there is still a minimum disinfection of three log removal. Examples should be provided like they do in drinking water standards.
- Craig said surface water implementation is difficult, which is because of the way EPA wrote the rule. Kathy asked what can be done to keep it from being onerous. Craig said including flexibility and the types of treatment techniques will provide approaches to achieving the standard.
- James said implicit in this approach is the acknowledgement that you have the ability to propose other technologies and demonstrate the technology will meet the standards. It allows a mix and match of treatment processes. If someone does not want to do the leg work they can look to the regulations and choose a technology, or they can decide to do something new and know what they need to do to demonstrate the log removal. Craig said the panel needs to define specific steps and minimum amounts of data collection to demonstrate efficiency.
- Kathy said the recommendations need to be in a form that the RAC will understand. James suggested taking the rules from the enhanced surface treatment regulations and presenting it as a concept that the panel would like to implement. James said the surface treatment regulations need improvement from an engineering perspective, but they set a precedent and everyone understands the theory behind it. Jay suggested developing tables to display the theory of removal credits, a table could clearly show that as long as you stay within validated systems testing would not be required. James provided an example of how these tables could be used: you could get one log credit for removal which can be from coagulation, filtration, etc., you could get another four log removal from disinfection which you could use membranes and chlorine or UV. This will allow the state to take advantage of the innovative technologies coming out of the private sector or other sources and approve the technology in a quicker fashion.
- Jay asked if option two would include a seeding test and calculating removal. James said there are people who have done their homework on that approach whether it is seeding or computational fluid dynamics (CFD) for disinfection systems. James asked if panel members thought there are enough indicators and pathogens that the panel can recommend water quality as an option without combining it with others. Kathy said the state surface water standards includes levels that are safe for water and are generally less stringent than the 2.2 removal of total coliform. Frank added there is information that links certain indicator concentrations to certain health outcomes. There is not information available on the organisms present in reclaiming wastewater and health outcomes.

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- James asked how water quality standard regulations would be developed. Frank said if the panel wanted to adopt a standard and base it on information in science literature, the group needs to look at literature related to recreational waters and develop standards on indicators based on recreation. Frank said another option is to develop regulations based on drinking water standards. Frank said he heard someone suggest earlier to base the regulation on panel members' personal experiences, and he supported this approach as well. Kathy said Ecology recently updated the surface water quality regulations and used literature done by US EPA and the standards for recreational water.
- *What information is needed in addition to the work that has already been done?* Frank said the panel needs to compile the body of literature available for the work that has been done in risk assessment and water quality pathogens in terms of health outcomes. Frank said he has most of the information and could make it available to other panel members via the sharepoint website. Frank said looking at previous work is a step forward but will not provide in absolute terms an approach to take. Frank also volunteered to develop a list of the major issues the panel needs to address moving forward.
- Angie asked what level of recommendation would be shared with RAC. Kathy said she would talk about this work conceptually but would not share the details of any proposed recommendation.

Proposed Recommendations:

1. Re-implement Pomona Virus study in Washington State.
2. Rule should include:
 - a. Technology based options
 - b. Flexibility to move toward log removal
 - c. Water quality based (health based)

Goal #3 Water Quality related to Environmental Protection

Jim provided a brief presentation on current environmental protection practices related to water quality. Jim highlighted the differences between land application versus land treatment, groundwater recharge, direct aquifer recharge, surface water recharge, and wetlands. Jim provided examples for each type of application and reviewed the treatment and permit levels. Jim emphasized that these standards go beyond human health to look at what is necessary to protect the environment.

Questions/Comments:

- *Are parks and lawns included in land application?* Jim said the part of irrigation where there is human contact potential is not part of this because the focus is on environmental protection. Jim said in considering additional water quality requirements for environmental protection it is assumed that the public contact issues have already been addressed.

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- *Does this address the TDS issues California is dealing with?* Kathy said Washington does not have the same saline water issues that California has. If you are using the reclaimed water outside you are getting better leaching and less salt build up.
- *Is all upland disposal considered recharge?* Jim said no, but the groundwater standard and the duplicity may need to be addressed.
- *Is it clear what is disposal vs. recharge?* Kathy said there has to be a beneficial purpose for recharge, but that is not clearly defined.
- Larry shared that the City of Airway Heights is restricted in groundwater infiltration because of the proximity to the landing zone at the airport; they do not want the water to attract birds. Larry said other limitations are being used in this location.

Wrap-Up and Action Items

During the next meeting TAP meeting on May 21, the panel will revisit the pathogen discussion and will talk more in depth about environmental protection.

Meeting Attendees

Department of Ecology

Katharine Cupps, Agency Lead

Angie Thomson, Facilitator

Emily Neff, Note Taker

Committee Members and Alternates	Guests
Bill Persich, BC	Clint Perry, Evergreen Valley Utilities
Emily Callaway, CH2M Hill	Ken Butti, LOTT Alliance
Linda Macpherson, CH2M Hill	Walt Canter, WASWD
Craig Riley, Department of Health	John Kounts, WPUDA
Denise Lahmann, Department of Health	
Larry Esvelt, Esvelt Engineering (phone)	
Jay Swift, Gray & Osborne Consulting Engineers	
James Hagstrom, PHCWA	
Dale Richwine, MWH	
Frank Loge, UC Davis (phone)	
Ecology Staff	
Jim McCauley, Department of Ecology	
Eugene Radcliff, Department of Ecology	