Exhibit 1

From: Mary Saunders
Sent: Wednesday, January 25, 2012 12:18 PM
To: Christine Stone
Subject: Bull Run variance

Hi Christine,

I left a message as well. I would like to know whether the cryto oocysts were genotyped, of if not, whether they will be in the near future. It would be irresponsible not to do this, considering the costs and risks of not doing it.

It is fine to respond on E-Mail if that is more convenient.

Thank you for your attention to this matter.

Mary Saunders
Irvington Neighborhood, Portland

Exhibit 2

From: Michael Coe
Sent: Wednesday, January 25, 2012 4:18 PM
To: pwb.treatment-variance@state.or.us
Subject: Portland water treatment variance

I do not believe the recent cryptosporidium finding in the Bull Run Watershed is of serious concern. The cost of treating Portland water for cryptosporidium remains far higher than the benefit to the public - really, the cost is infinitely higher, since there appears to be no benefit to the public from such additional water treatment. Please move ahead with the waiver that was proposed in your earlier draft order.

Thank you,

Michael Coe
Portland

Exhibit 3

From: jim
Sent: Wednesday, January 25, 2012 8:00 PM
To: pwb.treatment-variance@state.or.us
Subject: Cryptosporidium

News reports of cryptosporidium found in Bull Ruin water did not report whether or not this was a variety that is harmful to humans. The answer to that question would seem necessary.
Sent from my BlackBerry® smartphone, powered by CREDO Mobile.

Exhibit 4

From: Stephanie Potter
Sent: Thursday, January 26, 2012 9:59 AM
To: pwb.treatment-variance@state.or.us
Subject: Don't build treatment plant at Bull Run

I'm writing to say that I don't think the expense of a water treatment plant is worthwhile or necessary.
The recent discovery of cryptosporidium at Bull Run seems apparent to be an anomaly.
The Bull Run watershed is basically and natural, and inexpensive way to purify water.

Preliminary lab results from Dec. 30 found one oocyst -- a hard-shelled structure detectable by microscope -- at Bull Run's raw water intake. Another oocyst was found upstream. But testing from Jan. 1 and Jan. 3 didn't detect any cryptosporidium, the city reported.

"If this had happened after the variance was granted, we would be doing what we are doing today -- which is increased monitoring, increased sampling, investigating what's the cause, can we determine where it came from, and is there anything we can do about that," Shaff said.

Spending tens of millions of dollars to handle the occasional discovery of one or 2 oocysts, seems like a tremendous waste and over-kill, especially when increased monitoring, sampling and investigation, are a reasonable, inexpensive and alternative approach.

Please, do not force us to spend our scarce resources on such a boondoggle.
thank you,
Stephanie Potter
Portland, OR

Exhibit 5

From: Becky Rose
Sent: Friday, January 27, 2012 10:39 AM
To: pwb.treatment-variance@state.or.us
Subject: FW: PLEASE ALLOW the water treatment "variance" for Bull Run

First email bounced because it was sent to the incorrect email address that was given in the 1/26 Oregonian.

From: becky
To: pwb.treatmentvariance@state.or.us
Subject: PLEASE ALLOW the water treatment "variance" for Bull Run
Date: Thu, 26 Jan 2012 23:41:08 -0500

Hello,

PLEASE ALLOW the water treatment "variance" for the Bull Run Water Supply (do NOT require treatment for cryptosporidium).

I've been to Bull Run - I'm completely convinced that we get the best possible water quality by NOT treating this water.

Let's spend the $68 million doing something TRULY protective of our planet's fresh water supply -- think, for example, how many pathogens $68 million worth of composting toilets could keep out of our rivers and oceans!

Thank you,

-Becky-

Rebecca Rose
[redacted]

Exhibit 6

From: Tim Henwood
Sent: Friday, January 27, 2012 10:58 AM
To: pwb.treatment-variance@state.or.us
Subject: public comment on Bull Run Water treatment

Hello:

I think it is most important to consider risk vs. reward in any analysis. Based on my research (and it has been fairly extensive) Bull Run does not have anywhere close to a significant risk that outweighs the cost, degraded water quality, and possible Mercury leakage of UV bulbs breaking.

The other factor of which you are not directly affected by, but of which is significant enough to bias the decision making process, is the pressure of private industries and their public advocates that will benefit financially from implementation and ongoing servicing.

I am hopeful that you will be able to resist the pressure to implement what I consider a flawed (one size fits all) requirement (that was largely written by private interests) and make your decision based on prudent management of public assets and actual science.

Thank you,

Timothy Henwood
Portland resident

Exhibit 7

From: Susan L Smith
Sent: Friday, January 27, 2012 1:41 PM
To: pwb.treatment-variance@state.or.us
Subject: Significance of recent Cryptosporidium detections

Dear Administrator Shibley:

OHA has proposed to grant a variance pursuant to OAR 333-061-0045(13 allowing Portland Water Bureau (PWB) avoid construction of a UV treatment plant to inactivate *Cryptosporidium.* The primary rationale for the variance is that the Bull Run watershed is thoroughly protected from possible sources of the species of *Cryptosporidium* that most commonly infect humans: *C. hominis* or *C. parvum*, which are associated with humans and domesticated animals. During required monitoring in December 2011 and January 2012. PWB detected one *Cryptosporidium* oocyst in one sample at the drinking water intake and detected three *Cryptosporidium* oocysts in two water samples taken from at a location upstream of the intake within the Bull Run watershed.

Given these events, the Oregon Health Authority should delay granting the variance until the oocysts have been genotyped. If the oocysts are either *C. hominis* or *C. parvum*, their presence in the Bull Run watershed is inconsistent with the rationale for granting the variance and the variance should be denied, until immediate and enhanced monitoring establishes that the level of *Cryptosporidium* that could cause human infections is less than 0.000075/l level established under EPA's LT2 rule. As I understand it, this level is consistent with EPA's judgment that an annual risk of infection of 1 in 10,000 is a reasonable goal for public water supplies.

If the oocysts found in the samples are not *C. hominis* or *C. parvum,* OHA should proceed to grant the variance because the presence of oocysts that are not infectious to humans obviously does not create a risk to public health.

Assuming the oocysts recently detected by PWB are not *C. hominis* or *C. parvum*, the incidents in December 2011 and January 2012 underscore the need to alter the proposed variance's terms regarding revocation in the event that *Cryptosporidium* oocysts are detected during monitoring prescribed by the

variance. Before enhanced monitoring is triggered, any oocysts detected in monitoring samples should be genotyped. In the event that the oocysts detected are not infectious to humans, no enhanced monitoring is warranted and the OHA should not reserve the right to revoke the variance under those circumstances.

In the event that any oocysts subsequently detected are infectious to humans, immediate and intensive enhanced monitoring should be required sufficient to insure that the level of oocysts at the drinking water intake is below the level of 0.000075/l. I have seen differing numbers about the total liters that actually must be sampled in order to achieve that objective. The proper number of liters and the best sample size appears to depend on the quality of PWB's monitoring results as reflected in spike matrix recovery levels (which vary with techniques used and season) as well as the desired level of assurance about false negatives. Rather than attempt to prescribe that monitoring protocol now, I suggest the variance specify that (1) OHA will prescribe the enhanced monitoring protocol at that time and (2) the enhanced monitoring protocol will be designed to assure that the level of human-infectious oocysts is below the level of 0.000075/l and that the annual risk of infection from Cryptosporidium in Portland's drinking water is less than 1 in 10,000 human health.

The variance should specify that, upon receiving notification that Bull Run monitoring samples contain *C. hominis* or *C. parvum*, OHA will immediately propose to revoke the variance. The variance should further specify that the OHA will revoke the variance unless (1) PWB completes the monitoring specified by the enhanced monitoring protocol and (2) PWB submits monitoring data and other supplemental information establishing that the level of human-infectious *Cryptosporidium* is below the level of 0.000075/l and that the annual risk of Cryptosporidium in Portland's drinking water is less than 1 in 10,000. Providing more certainty about OHA's actions in the event of further detection of Cryptosporidium will allow PWB to rely more fully on the variance and avoid unnecessary expenses and will give the public more assurance about OHA's willingness to act in a manner than protects public health.

In terms of public notification about detection of *Cryptosporidium* during monitoring provided by the variance, I suggest that PWB be required to report any evidence of *Cryptosporidium* in monitoring samples to OHA and that OHA provide public notification of that report. OHA's public notice and press release will be more authoritative and can provide appropriate advice to immune suppressed persons about avoiding PWB water until genotyping is completed. In the event that genotyping establishes that human-infectious

Cryptosporidium was in the samples, PWB should be required to immediately notify all customers so that immune suppressed persons can avoid drinking the water.

In reviewing the regulation that governs the issuance of the variance, I note that OAR 333-061-0045(13) specifies: "A variance granted under this section shall be conditioned on such monitoring and other requirements as the Administrator of the U.S. Environmental Protection Agency or the Director of the Authority of Human Services may prescribe." As I read the regulation, the Director is required to adopt any monitoring or other requirements specified by USEPA. I suggest that OHA work with USEPA to specify mutually agreed monitoring and other conditions of the variance and that the variance record clearly reflect this agreement to avoid violating OAR 333-061-0045(13).

Thank you for allowing further public comment about the significance of the December and January monitoring data and for publishing a complete and thoughtful Intent to Grant Variance, which fully lays out OHA's thinking about PWB's variance request.

Respectfully submitted,

Susan L. Smith

Professor of Law, Willamette University

Exhibit 8

From: Joe Brown
Sent: Friday, January 27, 2012 2:48 PM
To: pwb.treatment-variance@state.or.us
Cc: cheryl brown; Bryan Hagen; Stephen Cameron; Dale Jones; Kasie Frank; Sharon Helms; Kelly Parkman; Michael A. Smith; Kale N Chalmers; Oliver Connolly; Vivian & Michael Wrinn; zancanella
Subject: Leave Bull Run alone

Greetings,

Thank you for taking public input on this most important question.

I am strongly opposed to the proposition to build a treatment plant for the Portland water supply from Bull Run Reservoir. I believe continued testing will prove it unnecessary to treat for cryptosporidium and an expense we can do without.

Thanks again for soliciting public input,

Joe Brown

Exhibit 9

From: sue beardwood
Sent: Monday, January 30, 2012 3:44 PM
To: pwb.treatment-variance@state.or.us
Subject: cryptosporidium

I contract Cryptosporidium a couple of years ago somewhere in Europe. When I returned home, I was very sick. It is nasty...nothing you want to get. I had to be treated by a Gastroenterologist...with expensive medicine and treatment. I was to lucky to have caught it in time.

Please cover the reservoirs in Portland and build a water treatment plant.

S. Beardwood

Exhibit 10

From: Kathryn Notson
Sent: Monday, January 30, 2012 4:05 PM
To: David Leland; Gail Shibley
Subject: Portland Water Bureau - 2/1/2012 City Council Agenda Item 115 - Resolution to request an LT2ESWTR open distribution reservoir compliance schedule extension from 2015 & 2020 to 2023 & 2025

The Portland City Council plans to adopt a resolution on February 1, 2012 to request an LT2ESWTR open distribution reservoir compliance schedule extension from 2015 (Mt. Tabor Park Reservoirs 1, 5 and 6), and 2020 (Washingon Park Reservoirs 3 and 4) to 2023 and 2025, repectively. I oppose this action.

On November 28, 1969, the Portland City Council was told to cover their open distribution reservoirs due to bird fecal contamination by Dr. Edward Press of the Oregon State Board of Health. The Portland City Council adopted Resolution 31165 on December 27, 1972 to cover the open distribution reservoirs, one every biennium, over a period of 12 years, to be completed by 1984-1985. The Portland City Council rescinded this resolution with Resolution 31807 on December 29, 1976. *Cryptosporidium* became a known human pathogen in the first half of 1976.

I'm reminding you of Michael Gearheard's "In My Opinion" letter to *The Oregonian* editor, published Tuesday, June 7, 2005, on page B9, which was based on this information from Portland Water Bureau documents which I obtained from the Portland Archives and Records Center.

The only reason the Portland City Council will request an LT2ESWTR open distribution reservoir compliance schedule extension is because a small group of Portland citzens is demanding the Portland Water Bureau do so. The City Council has catered to the demands of these citizens since May 29, 2002. The Portland Water Bureau does not have legitimate construction project sequencing requirements which must be done before the open distribution reservoirs are disconnected and decommissioned.
They will request this because they are "taking a page from New York City" which made such a claim so they could obtain an extension to cover their Hillsview Reservoir by 2028 or 2034.

I was told that the Portland Water Bureau will not construct the 25 million gallon Kelly Butte replacement reservoir in 2012, but in 2017, instead. (It was scheduled to begin construction July 1, 2012.) The construction of the ultraviolet light treatment plant has been "put on the shelf" because they assume they will obtain an LT2ESWTR treatment variance from OHA/DWP, in spite of the fact *Cryptosporidium* was detected at the intake pipe in the Bull Run watershed on December 30, 2011. I also oppose OHA/DWP's granting the Portland Water Bureau a 10 year LT2ESWTR treatment variance because of the detection of the protozoan parasite at the intake pipe. OHA/DWP and the USHEW and USEPA has been telling the Portland Water Bureau for over 42 years to cover their open distribution reservoirs. This is documented in OHA/DWP's public record. No more delays should be allowed.

"Those who don't remember the past are condemned to repeat it." Do not make the same mistake again by allowing the Portland Water Bureau to delay covering or burying their open distribution reservoirs.

Thank you for your time and consideration.

Kathryn M. Notson

Exhibit 11

From: A. Giedwoyn
Sent: Tuesday, January 31, 2012 8:14 PM
To: pwb.treatmentvariance@state.or.us
Cc: Gail Shibley
Subject: SAVE OUR RESERVOIRS & TERMINATE CONSULTANT CONTRACTS NOW!!

Dear Oregon state decision maker,
As a physician and concerned Portland citizen, I implore you to immediately terminate all consultant contracts associated with the Mt. Tabor disconnect, the Kelly Butte tank project, and the Bull Run UV Radiation treatment plant design. There has never been any problem in the community related to our Bull Run drinking water.
Why is taxpayer money continuing to be wasted on the design of projects that will provide no measurable public health benefit?
Why haven't the contracts already been terminated? When will they be terminated?
We need you to act in the people of Portland's best interest immediately, instead of in the best interest of corporations that stand to profit from unnecessary reservoir replacement projects and Bull Run water "treatment" that would degrade our water and further harm the local economy.
Portland residents are anxious to see you respond immediately to the EPA's LT2 changes in a strong, meaningful manner.
We will not stand idly by. We require these contracts to be terminated immediately, and we are growing less patient with each passing day. We have no more time to waste.
Thank you,
Aleksandra Giedwoyn, M.D.

Exhibit 12

From: mttaborhouse
Sent: Tuesday, January 31, 2012 9:08 PM
To: David Leland
Cc: Gail Shibley
Subject: Please save Portland's reservoirs

Hello,

I am writing in support of a revised reservoir compliance schedule of 2034. Please help to make this happen.

As you probably know, there is no reservoir compliance deadline anywhere in the LT2 rule.

Water rates keep increasing for no good reason. Bull Run water is perfect AS IS. I cannot afford to keep paying more for water! Equally important, my neighbors and I have legitimate concerns about the safety of a UV "treatment" plant and burying water underground.

This is truly a urgent matter. Public health and taxpayer money are at stake. Please, help.

Sincerely,

Olaf A. Bauer

Exhibit 13

From: Golden Age Muse
Sent: Wednesday, February 01, 2012 8:17 AM
To: Gail Shibley
Subject: Fw: Public Testimony .. review and adjust all Bull Run Water Shed and Open Reservoir Contracts to reflect a 25 year waiver supporting Our Open Reservoir systems

Good Morning all!

Note: the addresses in the CC of this e-mail are the ones to send your testimony to! OR pwb.treatmentvariance@state.or.us; [redacted]

Open Water Reservoirs

I have sent this letter in as my public testimony... Please, if everyone would give a very simple, short, testimony... Like... there is no proof that Open Water Reservoirs are unsafe. Open Reservoirs have been in use throughout our Nation and in Europe without harming humans for 100's of years. Our Bull Run System was designed by our forefathers to do just that and our unique system was built within Federally Protected land keeping it pristine and untouched. This is contained within the EPA Open Reservoir Manual as well as Joe Glicker's list of every conceived risk to a water system... Clever Boy... implying those risks apply to Open Reservoir systems when in reality, the cases he sited came from Closed water systems (dead birds, rodents, excrement). Closing (Burring) our water system will Cost over a Billion dollars with debt interest on the Bonds (of which PWB get's 3% of the value, not disclosed to rate payers) held by Wall Street. With the change in the Clean Water Act, Glicker and Friends, allowing for the newly written LT2 to repeal the Grandfathered status of all Open Reservoirs, to mandate UV Filters and buried water supply. The LT2 also recommends applying flawed Genotype testing for Cryptosporidium and to include approved, recommended Contractors for Genotype Testing. As stated LT2 was designed to take away all the Grandfather Clauses of the existing Open Reservoirs regardless of their compliance to the Clean Water Act and proven records for safety and maintenance ... And Joe Glicker working for the Water Bureau in the 1990's was in a position to go and work for private industry to help change the Clean Drinking Water Act's LT rule to Close all the Water Systems in the Nation at a cost of Trillions. Many municipals ended up selling their water rights. We do not want this to happen here in Portland. So by way of New York...

The EPA **granted** POST 9/11 New York exemption/extension from the LT2... releasing them from the Cost of 1.6 Billion. It was their Senator that sent a letter to the EPA asking for relief. If New York is not propagating FEAR with it's Wide Open Reservoirs, once bit - twice shy, why does PWB want to create it... CRYPTO! Please stop all projects reliant upon the Bull Run Water Shed until these pay-up-front, Design, bloated, contracts can be reviewed and adjusted to reflect the intent of PWB to support the Open Sun Kissed Water Reservoirs that Portland now enjoys.

I also testimony to the research I have done and to create a call to action from my community ....
Do you think Ch2M Hill's project at Hanford, radioactive... Being upriver on the Columbia, has anything to do with sharing their hidden agenda for a regional water plan, which combines (mixes) the 3 water sources, the Master Plan Permit, burring Bull Run, Mt Tabor & Washington Reservoir water, building a UV facility ET all, including the attachment of the endangered species Act and coding it Institutional, allowing everyone with a white coat to come into a system that is designed for minimal human contact ... .Do you think Ch2M Hill gives a shit about fish or our forefathers wishes?!!!! Joe Glicker has a plan... and it will be at the Portland rate-payer's expense under the guise of Crypto in Bull Run's Pristine Water shed and a variance that doesn't dissuade such hidden agendas common in the PWB (the pink elephant in the room)... we would need a waiver for 25 years, just like New York received from the EPA, to be assured that anything having to do with Bull Run Water Shed supports it's Open Reservoirs Status without UV or any other senseless Treatment plan.. And as the EPA scientists review the LT2 and the prescribed flawed GenoTyping Test for Cryptosporidium; that the Ch2M Hill's Boys and Friends have been trying to legitimize for the past 6 years. The fortunate thing is the Water industry knows that the test for Crypto is a coin toss, with 50% false positives and that is why the LT2 contained within The Clean Water Act is under

scrutiny and hopefully not by the Politicians but by the EPA Scientists that wrote the whistle blowing letter....

Even with a promise of a variance, now being called a waiver by Gail Shibley, graduate of Lewis and Clark College here in Portland, with a law degree in WATER and has the **last word** for Water as The State of Oregon Health Authority.

The State has asked for public testimony prior to their March decision; the PWB wants testimony by Feb 8th Tuesday...

PWB still pushes to bury it's water on Powell Butte, somehow obliged to Ch2M Hill.... Well, PWB is not giving up on their Ch2M Hill Projects, $80 Million plus a quarter. And come this morning, we will see how far along 60% done David Schaff is with the PWB Powell Butte Project and what the spin will be.. ... they like this spin.... our water bill is like our cable bill, our grocery bill, our insurance bill.... Shit, Portlanders own the water, a public utility, not a consumer item like an I phone or a pay per view sports event..

Why didn't PWB give the $20 Million it received last year, back to Portlanders, instead of making bike lanes and bioswales that require tons of maintenance and displaces vehicle parking .. the spin by Amanda Fritz... it would only equal out to .90 cents per person... My SPIN... It would have given our Portland Public Schools $20 million to spend if we would have credited their water bills for a few years... How will PWB spin this with Floy, Regna, Scott, Nancy, and all the Water Ninja's in attendance this morning? I am sure the progress on Powell Butte is well past 60% done and against the wishes of the public and out of both sides of Commissioner Leonard's mouth he relies upon Risk and Prudence and water storage for a growing population.. He creates the Risk with spin and Ch2M Hill supplies the Prudence or is it the other way around?!!!...

Build another Open Reservoir, not a costly ($80+ Million every 3 months) buried mess to deal with later. Just so you know, PWB purchased the tanks for Powell Butte 2 years ago in a "December Emergency" hearing... So if $20 million = .90 cents per person then the estimated $68 Million we would have back as water rate payers, could be spun again to ...$3.30 cents per person... Credit the money to the Parks and Recreation's Water usage or Yes, credit the public schools and lower the Portland Rate payers bills.... Now we have a few other things to keep our eyes on with Hanford's radioactive waste coming down the Columbia river and Ch2M Hill's contract to clean it up.... I figure with Microsoft Boy and Jet Blue Guy's FEAR of over population is merited for the 1% ... just knowing that since there is an amazing population explosion... there are lots o eyes on this changing the conversation... I hear the younger generation has more numbers than the baby boomers.... Wait till they get board watching 20 minute sitcoms and reality shows.. it happens.
Such as Buddhist programed AI (Artificial Inelegance) and Nanotechnologies merging to create something that will eliminate radioactive waste. Conceivable.

If Ch2M Hill wants to clean up the Willamette and Columbia Rivers to sell the water... Be up front and transparent... Portland should not be paying Ch2M Hill to clean up what they have been paid to do at Hanford. And Joe Glicker, VP Ch2M Hill, get your paws off our Bull Run Water Shed and Open Reservoirs... you wrote the EPA Open Reservoir Manual and took great pride in the maintenance schedules, protocols, treatment time tables and reporting systems you meticulously wrote about... Greedy B*&@!^$ wants the Industry to own Portland's citizens water but not till after Portland rate payers are milked dry paying for everything **up front.**.. I call it $250K in design planning. Totally planned to in-debt the City... a strategy used by PWB starting with Dan Saltzman and perpetuated by Randy Leonard. Pissed Off at the resiliency of PWB ability to keep an old, expensive, flawed plan, formed by an Industry that will do anything to further their aims and profits by making an end run on the Bull Run by changing the rules in the Clean Drinking Water Act.
Sincerely,
Beth Giansiracusa
We The People
97232

Exhibit 14

From: James Doane
Sent: Saturday, February 04, 2012 9:46 PM
To: pwb.treatment-variance@state.or.us
Cc: James Doane
Subject: Draft Variance for Bull Run Water

Dear Administrator Shibley:

The Oregon Health Authority (OHA) proposed a draft variance which would permit Portland Bureau of Water Works (PBWW) to avoid construction of a UV treatment plant intended to inactivate *Cryptosporidium.* The apparent rationale for the variance is that the Bull Run watershed has a consistently and inherently low risk of occurrence of *Cryptosporidium* and especially the species that most commonly infect humans: *C. hominis* or *C. parvum.* Subsequent to the release of the proposed variance, PBWW detected four *Cryptosporidium* oocysts at locations in the watershed where the water could readily flow to the water intakes. PBWW has since reported that the genotype of the four oocysts was not able to be determined (refer http://www.portlandonline.com/water/index.cfm?c=53849&a=382721).

Given the lack of conclusive findings for the genotypes of these positive samples, I can appreciate that there may be uncertainty by OHA on how to proceed with the proposed variance. If the oocysts were either *C. hominis* or *C. parvum*, their presence in the Bull Run watershed would be inconsistent with the rationale for granting the variance and the variance should be denied. Alternatively, if the oocysts found in the samples were not *C. hominis* or *C. parvum,* OHA should proceed to grant the variance because the presence of oocysts that are not infectious to humans does not create a risk to public health.

I recommend OHA grant the proposed variance at this time and include terms for additional actions based on the results of genotyping of all future positive samples. Specifically, any oocysts found in future positive samples should be genotyped and:

- If the oocysts are not *C. hominis* or *C. parvum,* no additional monitoring should be required because the presence of oocysts that are not infectious to humans does not create a risk to public health.
- If oocysts are *C. hominis* or *C. parvum,* enhanced monitoring should be required as outlined in the draft variance.
- If it is not possible to identify the genotype or if the oocysts are not genotyped, then OHA should assume the oocysts may be infective and require enhanced monitoring until such time as positive samples can be genotyped.

.

In summary, the recent detection of oocysts by PBWW in December 2011 and January 2012 underscores the need to alter the terms of the proposed variance regarding revocation in the event that *Cryptosporidium* oocysts are detected during monitoring prescribed by the variance. Before enhanced monitoring is triggered, any

oocysts detected in monitoring samples should be genotyped. In the event that the oocysts detected are not infectious to humans, no enhanced monitoring is warranted and the OHA should not reserve the right to revoke the variance under those circumstances.

PBWW's own work in the early 1990's indicated that filtration (either conventional or membrane) was a better alternative to meet what eventually became the LT2 rule rather than treatment with only UV light. I still consider UV disinfection to be only a partial solution to appropriate treatment of Bull Run water.

Thank you for allowing further public comment about the significance of the December and January monitoring data.

Respectfully submitted,

James L. Doane

Exhibit 15

From: Kathryn Notson
Sent: Monday, February 06, 2012 11:21 AM
To: pwb.treatment-variance@state.or.us
Subject: Portland Water Bureau - LT2ESWTR treatment variance - additional comments

[redacted]
February 6, 2012

Oregon Health Authority
Public Health Division
Office of Environmental Public Health
Drinking Water Program
800 N.E. Oregon St ., Ste. 640
Portland , OR 97232-2187

RE: City of Portland Bull Run Watershed Surface Source Water
USEPA LT2ESWTR Variance Request submitted 6/6/2011

Dear Mr. David Leland:

Since *Cryptosporidium* was detected at the Bull Run source water intake pipe on December 27, 2011, I oppose granting the Portland Water Bureau an LT2ESWTR 10 year treatment variance. It has been stated that one detection of *Cryptosporidium* at the source water intake pipe is enough to revoke an LT2ESWTR 10 year treatment variance immediately. For this reason, the Portland Water Bureau shouldn't be granted the LT2ESWTR 10 year treatment variance at all.

The date when the "running annual average of *Cryptosporidium* concentration drops below 0.075 oocysts per 1,000 liters" begins or ends isn't clear to the public. It should be specified in the OHA/DWP final decision if it decides to grant the Portland Water Bureau the LT2ESWTR 10 year treatment variance.

The Portland Water Bureau doesn't want to be penalized for a *Cryptosporidium* detection during a turbidity event. However, they don't switch from Bull Run surface source water to Columbia South Shore ground water until turbidity reaches 2.5 NTUs. It takes two hours to close the intake pipe and four hours to start the ground water wells before the public receives blended water. A two hour window is enough time for a protozoan parasite to enter the public water system and contaminate it.

The Portland Water Bureau has removed two LT2ESWTR required construction projects from their 2012-2013 budget. They removed ultraviolet light treatment plant and the Kelly Butte 25 million gallon replacement reservoir from their 2012-2013 budget before *Cryptosporidium* was detected at their intake pipe on December 30,2011. Both are required to be constructed and operating by April 1, 2014 to comply with LT2ESWTR. The Kelly Butte Reservoir was to begin construction July 1, 2012. The Kelly Butte reservoir construction was delayed until December 31, 2017. That date has since changed. They assume they will be granted the LT2ESWTR 10 year treatment variance.

Separately, the Portland Water Bureau will request an open distribution reservoir compliance schedule extension from December 31, 2014 to June 30, 2021 for the 25 million gallon Kelly Butte replacement reservoir, an extension from December 31, 2015 to June 30, 2024 for the Mt. Tabor Park Reservoirs 1, 5, and 6 disconnection and decommissioning, and an extension from December 31, 2020 to June 30, 2026

for the Washington Park Reservoirs 3 and 4 disconnection and decommissioning. In their request for these extensions, they will include "back fill" deferred construction projects which are not required to comply with LT2ESWTR and they are not required to be constructed before the Kelly Butte replacement reservoir and the ultraviolet light treatment plant are built. They are deferred maintenance construction projects which have been deferred before and can be deferred longer as none of their projects they will submit in their open distribution reservoir compliance schedule request directly pertain to the open distribution reservoirs themselves or protecting public health of the entire citizenry who drink Bull Run surface source water.

The Portland Water Bureau will make this request because they are catering to the demands of a small group of citizens who don't want to pay for either the ultraviolet light treatment plant or to cover or bury the open distribution reservoirs. They just want these projects delayed indefinitely or stopped entirely. They have made these demands since May 29, 2002. Further delays should not be allowed or tolerated any longer. I contend 42 years is long enough to delay complying with what is now law.

Sincerely,

Kathryn M. Notson
[redacted]

Exhibit 16

From: Tom Ward
Sent: Monday, February 06, 2012 7:52 PM
To: pwb.treatment-variance@state.or.us
Cc: David Leland
Subject: Variance Bull Run Water Source

February 8, 2012

RE: Comments on OHA's Notice of Intent to Grant Variance to Bull Run Source Water Under 42 USC 300g-4(a)(1)(B)

To Whom It May Concern,

I am writing to express my continued strong support of the Oregon Health Authority's intent to grant a ten year variance to the City of Portland for Bull Run source water.

The December 2011 City of Portland Water Bureau detection of Cryptosporidium-like organisms during routine screening, that could not be confirmed as cryptosporidium oocyts by each of the three reference labs, highlights the complexity of relying on current EPA approved methodology for monitoring the safety of our water supply, and on over reliance of microbiology surveillance in the absence of maximum use of supportive epidemiologic surveillance tools. That there is more "science" in laboratory-based testing versus traditional epidemiologic approaches has too often been a failed approach in past governmental responses, most recently highlighted by the German government response to a highly fatal series of food borne cases of E coli infection associated with renal failure.

In this regard, I would like to echo my support of Oregon Public Health Division's Dr. William Keene's statement on possible recent cryptosporidium detection that: "Area health departments will continue to monitor the reported occurrence of disease and will remain alert for any unusual incidence," and that recent events do not pose "any imminent threat to human health, nor do they suggest any need for remedial action or heightened surveillance efforts."

Again, I remain in strong support of the intent of OHA to grant a variance for Bull Run source water.

Thomas T. Ward, M.D.
Professor of Medicine
Oregon Health Sciences University
Head, Infectious Diseases Training Program Chair, OHSU Medical School Microbiology Course

Exhibit 17

Dave and Carol Specht

From: Dave and Carol Specht [redacted]
Sent: Thursday, February 02, 2012 7:55 PM
To: 'pwb.treatmentvariance@state.or.us'
Subject: Rare Occurence of Cryptosporidium Oocysts in the raw water intake of Portland's Bull Run Watershed

The occasional occurrence of Cryptosporidium Oocysts in water testing samples obtained as noted above is almost certainly below the Threshold Limit Value (TLV) necessary to produce clinical disease (dysentery) in humans. In making this judgment one should recall that the Chicago Epidemic was caused by water runoff from livestock feedlots in adjacent lands which entered Lake Michigan to close to the water supply intake towers. This type of dense animal population contamination is not the situation Portland's closed-entry Bull Run Watershed located in Mt. Hood National Forest. Therefore, the above named occurrence should not be used as evidence to stop the variance request to the application of the Federal Long Term 2 Enhanced Surface Water Treatment Rule.

H. David Specht, M.D.

THE E-MAIL ADDRESS POSTED IN "TO:" ABOVE, DERIVED FROM THE GRESHAM OUTLOOK NEWSPAPER, FAILED TO OPERATE, RESULTING IN THIS MAILING BY U.S. POSTAL SERVICE. HDS

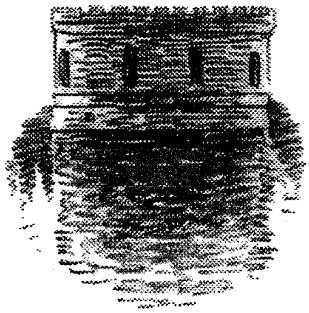
Exhibit 18

From:	floy jones
Sent:	Tuesday, February 07, 2012 5:38 PM
To:	pwb.treatment-variance@state.or.us; David Leland
Subject:	Bull Run Variance- Notice of Intent to Grant comment
Attachments:	Convincing the Public by Glicker 1990 PDF.pdf; Consultant Contracts3jan11 11x17 LT2.pdf; BRvariance2.pdf

Mr. Leland
Thank you for this opportunity to comment on OHA's Intent to Grant a Variance for Bull Run.

Friends of the Reservoir comments can be found in the BRvariance2 PDF (attached). The additional two PDF attachments (Convincing the Public and Consultant Contract PDF's) are also submitted for the public record and are referenced in our comments.

Floy Jones



FRIENDS *of the* RESERVOIRS

Citizens joining to protect Portland's historic reservoirs and water system

3534 S.E. Main Street, Portland, OR 97214 www.friendsofreservoirs.org

www.lists.pdx.edu/mttabor

By Electronic Mail

February 8, 2012

To: Oregon Public Health Division
State Drinking Water Program

Re: OHA Intent To Award Bull Run Variance and significance of public reporting of EPA 1623 "detects"

Support for Variance

The Friends of the Reservoirs position in support of a Bull Run variance (or waiver) from the LT2 source water treatment requirement is represented both in our November 18, 2011 comments and the joint January 3, 2012 comments submitted by Regna Merritt and Theodora Tsongas, Physicians for Social Responsibility, on behalf of public health, environmental, business, neighborhood, democracy and other organizations. Friends of the Reservoirs question why OHA has not included, in it's posting of public comments, the attachments submitted for the official record as part of the Friends of the Reservoirs November 18 comments. Included in those attachments is a scientific *Cryptosporidium* study, AwwaRF 3021, (and a Portland Water Bureau summary of their involvement in that study) of Bull Run water delivered directly to Portland customers from the outlets of the open reservoirs demonstrating that Portland (and all participating utilities) already meets the goal of the LT2 rule.

Flawed EPA Sampling Method

The reporting of 3 or 4 "detects" in December 2011 and January 2012 highlights the long-acknowledged problems with EPA's 1623 sampling methodology and underscores the need for revision or repeal of the LT2 rule. It also supports the contention that variance conditions such as increased monitoring and/or other actions affecting Portland's variance not be based on method 1623 "detects" or a sampling methodology that does not determine infectivity. The nature of the Bull Run watershed is such that it is likely that water entering the intake would have only older, more degraded and noninfectious oocysts of any species. **Obviously, the presence of non infectious oocysts does not pose a risk to public health thus OHA decisions must not be based on results from a methodology that does not**

distinguish between harmless and harmful *Cryptosporidium*.

Additional Lab and Scat sample results

As noted in the Portland Water Bureau's January 23, 2012 Technical Report addressing the so-called "detects," the secondary EPA-approved lab could not confirm or corroborate the presence of oocysts. Had they confirmed the presence of an oocyst, that result alone would provide no information about risk to public health. As acknowledged by OHA public health official Dr. Keene, most *Cryptosporidium* species are not infectious to humans.

The PWB subsequently tested additional scat samples collected from rodents, coyotes, a bobcat, hare and beaver and also dissected a hare found dead in the watershed. No *Cryptosporidium* was found in the scat or deceased hare just as with earlier scat sampling.

In promulgating the LT2 rule, EPA overestimated risks, overestimated benefits, and underestimated compliance costs[1]. None of the national data collected utilizing EPA's sampling methodologies,1622 and 1623, can inform whether 20%, 10% or 5% of the "detects" were infectious to humans. As the American Water Works Association stated in their December 2011 Streamlines article, the LT2 rule unravels when the flaws of the sampling method are corrected.[2] According to the AWWA, EPA has stated that they plan to redact data (though not specifying which data will be redacted) from the 1st round of national data collection post LT2 promulgation, but acknowledge "that the lower level of observed {*Cryptosporidium}* occurrence appears to be real and not due to a systematic change in recovery." [3]

OHA should submit comments to the EPA during the current LT2 review [4] in support of an improved sampling methodology, one that distinguishes between harmless and harmful *Cryptosporidium*.

Public Notification of "detects"/ Professional Connections

Media notification of the so-called Bull Run "detects" was poorly managed unnecessarily causing concern for some when in fact no cause for concern exists. The media apparently was not informed that most *Cryptosoridium* are not infectious to humans, nor was there media follow-up reporting when the secondary lab was unable to confirm or corroborate the presence of actual oocysts.

The Unfiltered Systems Working Group[5] in their comments to the draft LT2 rule stated that "an overestimate of risk reduces the consumer's confidence in the public

1 Unfiltered Systems Working Group, Comment on proposed LT2 rule, 1-09-04, EPA Water Docket OW-2002-0039-0523 and New York City comment on proposed LT2 rule, 1/09/04, EPA Water Docket OW-2002-0039-0516

2 http://www.awwa.org/publications/StreamlinesArticle.cfm?itemnumber=58066

3 AWWA Streamlines summary of EPA December 7, 2011 LT2 meeting on sampling, http://www.awwa.org/publications/StreamlinesArticle.cfm?itemnumber=58066

4 Obama's Executive Order 13563 directing agencies to review, revise and repeal burdensome regulations

5 New York , Boston, San Francisco, Seattle and Tacoma

water supply and may be used by less scrupulous interest groups."

Conflicts of interest exist related to the LT2 rule and the future of Portland's Bull Run system [6]. We recognize that inevitably there are connections between water industry professionals, but concern exists that the influence of these connections may lead to the misdirection of public investments from more cost-effective public health investments.

As a Portland Water Bureau official, a Mr. Joe Glicker wrote a paper entitled, *Convincing the Public that Drinking Water is Safe,* a paper that addresses how utilities can manage (and manipulate) the media and public opinion. In his paper *How to Convince the Public the Water is Safe ,* Mr. Glicker opines that the media does not report science, but opposing opinions, he advises utilities should determine what the public should know stating " they must be told what you have determined they ought to know". He says, "The counter opinion that everything is safe is reported, but only as a small part after the basic assertion of a problem is established." "Fears, anxieties, and other emotional issues form the basis of how the public will view the situation.[7]"

Since leaving the Portland Water Bureau in 1994 Mr. Glicker has been a revolving-door consultant for the PWB with MWH Global 1995-2006 and CH2MHill 2006-present . One of his many Portland Water Bureau consultant contacts was a five-year contract to help craft EPA enhanced surface water regulations specifically participating in the EPA LT2 Federal Advisory Committee process in Washington D.C. (contract 31056). Mr. Glicker and his associated corporations have been the beneficiaries of several PWB LT2-related design contracts including the UV Radiation treatment plant contract.

Public Health Officials Should Report Public Health Information

In a January 4, 2012 internal communication Dr. William Keene, Oregon Health Authority senior epidemiologist, stated "Most studies find some Crypto in most watersheds most of the time----often species that are of little significance to human health". He goes on to state that the Bull Run detects do not "suggest any need for remedial action or heightened surveillance efforts".

Once a *Cryptosporidium* "detect" is reported in the media, the science doesn't get appropriate follow-up. We believe that with your expertise as public health officials you are best equipped to determine when and how best to present information to the public. By maintaining this function within OHA, you will more likely prevent an overestimation of risk that "*reduces the consumer's confidence in the public water supply and may be used by less scrupulous interest groups*."

Attached for the public record 1) Mr. Glicker's article, *Convincing the Public that Drinking Water is Safe and 2) Glicker contract* chart delineating conflicts of interests related to the many overlapping and interconnected

6 Joe Glicker, Montgomery, Watson Portland Water Bureau Federal Regulation contract 31056

7 *Convincing the Public that Drinking Water is Safe*, by Joseph L. Glicker, pages 4, 5

consultant contracts related to Bull Run treatment plant and reservoir projects.

CITY OF PORTLAND BUREAU OF WATER W«.

INTEROFFICE MEMORANDUM

DATE: March 11, 1990

TO: WQEP Personnel

FROM: Joe Glicker 

SUBJECT: Convincing the Public…

Attached is a copy of a paper I gave to the B.C. Water and Wastewater Association a couple of week ago about "Convincing The Public That Drinking Water is Safe". It touches on some of the issues we discussed at our last organization development session on the relationship between the technical and the non-technical. I hope you find it helpful. Let me know of any comments, questions, or responses on it you may have.

cc: Mgtteam, Ross, Trudy

CONVINCING THE PUBLIC THAT DRINKING WATER IS SAFE

Joseph L. Glicker, P.E.
Water Quality and Environmental Policy Director
Portland, Oregon, Water Bureau

Providing safe drinking water is the goal of every water utility. In meeting this goal, the water industry often used to be called a "silent service". Its employees provided the water and few outside the industry took notice or cared about what the industry did or how it was done as long as the water got to the tap.

Environmental awareness has changed that. Worries about pollution, the explosion in technology to study environmental problems and to spread information, and sales campaigns for home filters and bottled water, all have led to the public being more and more concerned about the quality of the water coming from the tap, even in the absence of any degradation of that quality.

The public's view of how well a utility is doing its job often used to be measured by whether or not water came out of the tap when it was needed. This was an objective, readily identified, measure. Utilities were perceived as part of "public works". Concern was about getting the physical water system in place.

Now that the infrastructure is in place, the public's view of a water utility is usually determined by how the public perceives the quality of the water that it now assumes will always be there when the tap is turned. While this water quality itself may be objectively determined, the public perception is formed by many subjective and emotional factors regardless of the objective water quality.

Satisfying these new public expectations requires activities, efforts and programs beyond those which water utilities have traditionally performed. Unlike the technical and financial programs that occupy most of a utility's resources, these programs must deal with subjective and emotional factors. They require interaction and involvement with the public. The industry can no longer afford to be a silent service.

However, like the technical and financial-programs, a program of public interactions will only be successful if it is based on an understanding of the nature of the subject matter — how the public perceives water quality and environmental issues. This paper will discuss how the public comes to its perceptions and how to deal effectively with the problems this presents. It also provides some examples from the Portland Water Bureau's experiences with putting this into practice.

How the Public Forms Risk Perceptions

Human beings are not particularly rational. This "irrationality" expresses itself in how the public perceives issues of risk and safety. When experts judge risks, their responses tend to correlate with technical estimates of annual injuries or fatalities. While lay people can also produce these estimates of annual fatalities reasonably well, when they judge risks, their responses relate to many more complicated factors. Table 1 (adapted from reference 1) presents a typical comparison of expert and lav assessments of risks.

Public risk perceptions are based on social, cultural and psychological factors. Researchers from these fields have identified many dimensions of risk that influence public perception and decision making on risk issues (see Table 2, adapted from reference 2). People judge risks on the basis of how likely it is that an effect will occur, how widespread the effects are, who is affected, and how familiar they are with the risk, amongst other factors. Issues of choice and control strongly influence risk perceptions." People perceive risks that are not voluntary, and which they do not control the source or management of, as being more dangerous. Risk perception is also strongly influenced by perceptions of the relationship of who incurs the risk to who receives the benefit. If one group is asked to bear the potential risks while another group reaps the benefits, then the activity will appear relatively more dangerous.

As an example of these factors, in Table 1, experts judge nuclear power as 20th most risky activity or technology among those listed, on the basis of the estimated number of injuries or fatalities it causes. The lay group judges it as most risky because the real risks are unknown, nuclear accidents have catastrophic consequences, these consequences can extend to future generations, those receiving the benefits of the nuclear power plant may not be the same as those who would suffer the consequences of an accident, and nuclear power is unfamiliar in everyday life. Neither of these approaches to deciding the relative risk of nuclear power is inherently "right". They both have merit, but they both lead to different decisions on the desirability of nuclear power.

Particularly influencing public perceptions on drinking water issues is the dread component of substances thought to cause cancer. While cancer causes only 20% of all deaths (3) and personal lifestyle related choices (smoking, food, alcohol, etc) are generally thought to be associated with 70% of all cancer and environmental pollution with less than 5% (4), cancer evokes significant fear and anxiety. This, coupled with other factors such as lack of control over substances in drinking water, makes the public particularly sensitive to issues of potential carcinogens in water.

Risk concerns are often a surrogate for other social or ideological concerns. They may provide a basis or rationale for actions taken as a result of other, non-risk related beliefs. Pollution is often perceived as morally wrong, regardless of the level of risk or practicality of reducing the risk.

As an example, consider the growing trend toward consumer purchase of "organic" produce as a result of concerns about pesticides on foods. The carcinogenic risks of pesticides are often cited as the reason for consumer purchase of this produce. A recent risk assessment was conducted on food-borne carcinogenic risk (5). Estimates of known carcinogens in food, spices, flavorings, additives, pesticides and the like and simple calculations were used to define cancer risk from various components of food. The assessment estimated that 98% of the cancer risk in food comes from the traditional foods themselves (grains, fruits, vegetables, meat, poultry, etc); 2% comes from food additives (sugar, salt, spices, flavorings, etc); and 0.01% from pesticide residues. There have been instances where plant breeders have had to withdraw naturally insect-resistant vegetables from the market because of the toxicity of the natural chemicals within them (6). While this, and similar risk assessments may or may not be accurate, they clearly have not diminished the opposition of many to the use of pesticides on food crops. Pesticides are often perceived as unnecessary, as disproportionally affecting field workers and as being ecologically unsound. Thus, their relatively low cancer risk compared to the food itself may ultimately be irrelevant to public perception on whether or not to use them.

Contributing to the public perception of risk is the human difficulty in dealing with probability and uncertainty, both of which underlie risk formulations. Studies have shown that presenting the same risk information in different ways (say in terms of numbers of persons saved instead of numbers harmed) will influence how the situation is perceived and what actions will be taken (7). Potential losses seem larger than potential gains. Low probabilities seem larger than they are and high probabilities seem less than they are. That may be partly why a person may buy a lottery ticket and a pack of cigarettes at the same time (8).

Public perceptions are also influenced by ~~–h~~igh signal events" (1). Some events have impact far beyond the direct harm they cause. Events that provide new information, or are seen as harbingers of further and possibly catastrophic consequences, may strongly influence public perceptions. Thus, a train wreck that claims many lives may produce relatively little social disturbance beyond that experienced by the victims' associates. But a nuclear power plant accident can change regional or national energy policy.

Understanding the Media

Because the media can set the public agenda and frame the debate on environmental issues, it is important to understand how the media sees environmental issues. It is also important to understand that how the media sees these issues is not much different than how the public sees them. Most of the lessons about the media apply to the public as a whole. (This material is discussed in more detail in references 10 and 11).

The news media are in the business of reporting news. They are not in the business of public education. Thus, events are important to the media, but issues and ideas are not. An environmental issue is news only if there is some event to accompany it – a violation of a standard and a public notice or a problem in the distribution system. When the media does cover an environmental story, it is rarely the science of the story that will be covered. The details of toxicology, risk assessment, and testing, which are all needed to understand an environmental issue, are not events and therefore are usually not newsworthy. What the media will cover is the ~~–p~~olitics" of the issues – who says what.

While journalism strives for ~~–o~~bjectivity", the word has different meaning in journalism than in science. In journalism, there are no ~~–f~~acts" and no ~~–t~~ruth". There are only conflicting claims or opinions that must be covered as fairly and balanced as possible. Journalism's aim is to present these conflicting views so that the audience can decide for itself what is the truth. In presenting the various viewpoints, most media look for certain positions on issues. Consider a scale of positions on an issue that ranges from 0 to 10. Journalists will not pay a lot of attention to the 0's, 1's, 9's, and 10's since they tend to be too extreme to be credible. Similarly, they pay little attention to the 4's, 5's and 6's since they are too middle of the road to make for interesting reporting (~~–n~~eeds more research" does not made for a good headline). Thus, it is the 2's, 3's, 7's and 8's that get the attention – those people with the clearly defined and articulated position. Objectivity in the press then becomes giving these two groups their chance to present their views.

While reporters will present both sides of an issue to achieve balance, this does not mean that both sides will get equal attention. This is because claims of risk are inherently more newsworthy than claims of safety. Without an allegation of a problem, there is no event and therefore no story. The allegation of the problem is the story and therefore gets most of the attention. The counter opinion that everything is safe is reported, but only as a small part after the basic assertion of a problem is established. This is not bias as journalism

understands it.

Because of this definition of objectivity and how it is presented, the media reduce most stories to a dichotomy. The water is either safe to drink or it isn't. The treatment plant should either be built or it shouldn't. The gray areas, the subtle explanations, and the tradeoffs on environmental issues are often lost in this simplification process.

Reporters will also often try to personalize the story. This is because we all have to make individual personal decisions. Real people facing real decisions, and not abstract calculated uncertainties, is both more interesting to the audience and more reflective of what the audience will face.

Finally, reporters usually are not usually trained or educated in the areas of science and technology. They have to do their jobs with limited expertise and time. They often have to do several stories in a day on vastly different topics. They do not have the time or experience to understand complex, technical problems. Their job is to present the views of others on the issue and not to explain the technical aspects of the problem.

Understanding Public Reactions

Because of how the public views risks, emotion is a critical quality in any interaction with the public on environmental issues (10). Fears, anxieties, and other emotional issues form the basis of how the public will view the situation. If these feelings are not acknowledged in some way in the interaction, they boil over in destructive ways.

Issues of control and equity often underlie these emotions. Any environmental controversy has two components - the substantive issue of what should be done, and the process issue of who should decide what to do. If people feel shut out of the decision making process then they will often be unyielding on the substantive issue, even when the decision is in their best interests. Any unacknowledged emotion then gets chanelled into passionate actions against the decision.

This is compounded by the lack of trust that most people have in government and industry and by our society's current propensity for use of the adversarial judicial system to resolve disputes. Reassurances that everything is safe are generally received with skepticism and suspicion. Even among those who do not openly express their distrust, it is usually because they feel powerless and victimized rather than because they trust or believe that everything is well (10).

The public's reliance on emotional components of decision making is strengthened by the confusion that results from scientific disputes and disagreements (12). Some of this confusion is inherent in the methodologies by which science progresses. Theories of "the way it is" change over time as new facts and ideas emerge. Some of this confusion stems from the fact that different scientific disciplines, like epidemiology and toxicology, approach and solve similar problems in different ways, often leading to different conclusions. Some confusion results from the conservatism in public policy approaches that have been mixed in with the science to provide a margin of safety in the face of significant scientific uncertainties (13,14).

Personal experiences, anxieties, fears, difficulties in understanding probabilities and media coverage all

contribute to the public denying uncertainties, misjudging risks (sometimes overestimating them, sometimes underestimating them) and giving unwarranted confidence to judgements or opinions about facts. These difficulties do not usually go away in the presence of new evidence. New evidence may even make resistance greater because this new information reinforces the view that the emotional concerns have been ignored. Initial views are resistant to change. New evidence appears reliable if it is consistent with one's initial beliefs, but contrary evidence is dismissed as unreliable, erroneous or misapplied.

People do not have an unlimited capacity for the amount of information they can absorb or the pace in which it can be absorbed (15). While people want to be informed, they must feel comfortable with the nature and amount of information they are asked to take in. Too much information will make them feel overloaded and seem disinterested, while too little will cause them to form opinions and take actions based on wrong information. Similarly, it is easier for a person to tolerate change if it is spread slowly over a period of time than if it occurs all at once. Rapid dissemination of new information may trigger defenses that will distort the information.

Water has a unique role in emotional associations for people (15). Water is essential for life and is used by all people in virtually every situation. Notions of water contamination convey threats of sickness and great personal hardship. Notions of water purity and natural preservation convey suggestions of health, a peaceful existence, and a safe and protected life. Thus, discussions of water quality issues can be especially emotionally charged.

Like the media, the public also dichotomizes risks, because, ultimately, they will have to make dichotomous decisions. They will either have to buy bottled water or not, vote for the bond levy or not, or drink the water or not. This may cause the public to treat the risk as frightening or to dismiss it as trivial.

Dealing Effectively with the Public

Despite the difficulties presented by the above analysis of how the public perceives and deals with issues of environmental risk, a coherent approach to public interactions designed to achieve public confidence can still be fashioned. This approach relies upon the understanding, acceptance and fulfillment of the public's needs. While it may be possible to suppress public concerns or avoid needed actions for relatively short periods of time, these suppressed needs will ultimately assert themselves. The goal of communications must therefore be to develop an informed, reasonable, collaborative, solution oriented public.

The key to the approach is to accept and acknowledge the emotional responses and content as valid dimensions of the issue. The water utility must accept a new role for itself as part of its basic mission. What the public needs to feel confident in the decision making that it has entrusted to the utility is different than what the utility must do in order to make those decisions. The utility must bridge this gap so that the decisions it makes based on rational, scientific processes are acceptable to a public which judges acceptability on emotional and value driven criteria.

The concerns, values and wisdom that are inherent in lay conceptualizations of risk issues must be respected. The public must know that you care, that you understand and value their views of the issues. Underlying fears and hidden agendas must be stated and brought into the open. Trust and credibility are more important than quantitative data and facts in satisfying these emotional needs.

While trust-and-credibility are more important than data, decisions must be made on the basis of sound, scientific information. Judgements must be good ones. Trust and credibility are fed by competence and performance.

Accepting the emotional content of issues means acknowledging the uncertainties and assumptions involved in the decision making process. Difficulties in measurements, areas of lack of knowledge, and ranges of possible outcomes all need to be acknowledged and explained.

Because issues of control are so fundamental in determining reactions to perceived risks, it is critical to let those affected by or concerned with decisions participate in the decision making process. This does not mean that decisions are put up for a vote! The typical agency tactic of putting a "draft" decision up for review and comment also fails to provide the needed processes. What does work is to allow stakeholders to be heard and to be included early in decision making processes, and to present them with a range of options and as much needed factual background material as is available to work with so that their input can and does have an impact on the decision making.

Communications with the public must be a dialogue and not a "one-time shot". The public must be given time to learn, to accept, and to adjust to new information and to see that the dialogue results in changes on the part of the agency. This dialogue must be accomplished using multiple sources of credible information, such as health agencies, regulatory agencies and other perceived independent experts or trusted community leaders.

Information must be targeted to specific audience needs, concerns, preferences and levels of knowledge. Messages must be clear, focused, simple, concise, and contain minimal jargon. Human contact must be established with the audience. Warmth, caring, and understanding must be shown in communications.

If there are problems in a water system, get the information out quickly and accurately. Focus not on the problem, but on what is being done to solve it and how the public can help in that solution. Public debate over whether or not chlorination is carcinogenic is not as likely to be effective in satisfying public concerns as is discussion on what the utility is doing to minimize disinfection byproducts, regardless of how carcinogenic they may ultimately turn out to be.

Successful communication of information requires telling people three levels of information. They must be told what you have determined they ought to know in order to deal with the issue at hand. You must think through what your information goals are and what the audience need is and keep the emphasis on those areas. Next, people must be provided enough background or context information to prevent confusion or misunderstanding. They must be provided with the information that will keep them from going off-track. Finally, they must be given enough qualifiers and guidelines to prepare them for the future, for what you don't know or might learn later, so that they will not feel misled.

If risk comparisons are used, such as comparisons of the risks of getting one cancer in a million, then these must only be used wisely. These comparisons must be based on considerations of how the public perceives risks. The qualitative dimensions of risk perception must be used to provide risk characterizations of a similar character. Assumptions and uncertainties that go into the risk comparisons must be acknowledged. When available, standards from the government or other credible sources are useful. For example, saying

that the risk of death from cancer from chloroform in drinking water is equivalent to the risk of death from cancer from radiation from flying round trip cross country, while perhaps true (16), is not likely to be an effective risk comparison. The airplane cancer risk may be seen as a voluntary, familiar activity, within the control of the individual. The risk from chloroform is involuntary, beyond the control of the individual, and with a high dread factor. However, saying that the risk of cancer in drinking water from chloroform in a water supply is half the level that the Environmental Protection Agency says is safe, may be an effective means of risk comparison.

Finally, community and media relations must be seen as important, integral components of a utility's operation that are critical to the success of the utility and not as a necessary evil or something to shunt off to the side in favor of "real work".

Dealing Effectively with the Media

Dealing effectively with the media is similar to dealing effectively with the public. You must know what message you want to communicate and this must be done in simple, clear, concise terms. Communication with the media is best done as a dialogue, and not a one time affair. Do not wait for the reporters to come knocking on your door about a problem. Seek them out with stories you feel are important. Educate them about why it is important.

When reporters seek you out, be cooperative. Don't hide things from them, but instead explain why you cannot tell them information they would like, such as the data are unconfirmed and may have errors. Tell them when you will be able to give them the information they seek and then do so.

As with the public, know what points you want to make and stick to those points. Provide enough context and background information for the media to make sense of what you are telling them. Remember that you are really talking to the public through the media.

Show your feeling about the subject to them. Let them know you care, that you drink the water too and that your goals and values are the same as the community's.

If there are inaccuracies in stories or you do not like the slant of the story, follow up with the media. Call the reporter and editor and explain what you saw that was wrong with the story and why. Often it will result in a follow up story focused on your view, since your concerns may now become the "event" that is reported.

Putting It Into Practice - Portland Water Bureau's Program

Like programs for other utilities (17), Portland's efforts to assure the public that its water is safe have evolved over time. Community relations, customer service, administrative and water quality personnel all work in partnership to satisfy public expectations.

For many years, the Bureau has maintained an extensive water quality customer complaint program. Calls from customers are taken, their problems, questions and concerns discussed with them, and appropriate action taken. Consumer information on water quality is provided, lines are flushed and water samples from the home are often taken and analyzed.

A series of public information brochures have been prepared on water quality topics of interest and are run as bill stuffers. So far lead (twice), groundwater protection, use of home filters, and a discussion of the most often asked questions and their answers, have been among the topics. We have also prepared and distributed more specific information brochures about particular projects geared towards various stakeholders and interest groups.

A monthly water quality newsletter, from one to three pages in length, is mailed to a list that has grown to over 200 persons and organizations. This newsletter provides current information on legislative and regulatory issues, status of major projects, and details about water source protection, and quality issues. It is sent to environmental groups, news media, other governmental agencies, elected officials, industries and individuals who have expressed a detailed interest in water quality issues.

The Water Bureau provides speakers for community and interest group meetings to discuss water quality issues. Professional organizations, local college classes, neighborhood associations and environmental groups have all been addressed. The Bureau also has a public information trailer that is set up at various outdoor summer fairs around the city. Brochures and other information are distributed from this booth and consumers' individual questions are answered by those staffing it.

Close contact is maintained with federal and state regulators, local public health officials, and other water utilities in the Portland area, the State and the Northwest. We participate in regional and national American Water Works Association committees involved with public education and information. These contacts are used to exchange ideas and provide outside views and perspectives on decisions we make. State regulators in particular are involved early in decision making processes so that their expertise can be drawn upon.

The Bureau also maintains close contact with local news media. We have provided them with tours of our facilities, called them when we had things we thought might make good stories, and provided in-depth background briefings to meet their needs. We also have responded to their requests for information with as much as we have available.

The Bureau is in the process of conducting extensive public attitudes research to help us better design tools to respond to public needs for information. Through the use of focus groups, telephone surveys, and key community leader interviews, we are learning about the specifics of public concerns, values, level of understanding and desires as they relate to water issues.

A citizen Water Quality Advisory Committee has also been established. This Committee has members representing a wide range of community interests and meets monthly in formal public meetings to hear information on, discuss and provide policy advice to the Bureau on water treatment, water resource protection and other water quality related issues. Interested citizens also come to these meetings and present their concerns, ideas and issues they wish examined. An example of the types of issues that this Committee provides advice on, was the decision of which option to select in meeting the disinfection "CT" requirements of the Environmental Protection Agency's Surface Water Treatment Rule.

The final component of our program is a highly competent water quality staff and a very active water quality program. We do monitoring in anticipation of and in excess of regulatory requirements, we conduct studies to gain a better scientific understanding of the operation of our water system, and we vigorously participate in legislative and regulatory arenas to help shape the future that we will face. We present the

information from all these activities to the public using the above mechanisms.

The future presents many challenges for us in dealing with the public and maintaining public confidence in our agency. There will be treatment changes to meet new regulations, new supplies will have to be developed to meet the demand of a growing population, changing societal values on environmental issues will effect how we operate our existing supply system, and water rates will be going up to pay for all this. Only if the public is an informed partner working with our agency, will it be willing to make all this occur. An effective program of public interaction will be essential in achieving this.

EPA LT2, Bull Run Water Treatment Plants, and Costly, Unneccessary, Buried Storage Tanks

The result is corporate benefit over Portland's community interest, and it's no accident.

Many corporations were involved, but here's the outline of Portland's role:

Ex Portland Water Bureau executive Joe Glicker seems to be the chief architect of the corporate vision for Portland's Bull Run system.
He has been influencing Portland Water Bureau policy, and been on corporate retainer, almost constantly for 30 years.
His employment history:

Portland Water Bureau (PWB)	1980-1994	(Engineer, manager, whose job title changed over the years.)
Montgomery Watson Harza Global (MWH)	1995-2006	regional vice president
CH2M Hill	2006-present	regional vice president

Upon leaving the Portland Water Bureau, aided by a Portland Water Bureau-dominated selection committee, Joe Glicker immediately secured lucrative Portland Water Bureau consultant contracts for his new employer the global corporation, MWH. Through this string of overlapping and interrelated consultant contracts, Glicker, who was influential in negotiating the EPA LT2, has been able to set the corporate-benefiting course for the future of our Bull Run open reservoir system. Unnecessary additional Bull Run treatment plants and buried tanks are projects that will degrade our system, create new and unique public health risks, create massive debt, and more than double our water bills, all while providing no measurable public health benefit. None of this has been possible without the support of City Council. It's highly possible that, as a result of these unnecessary projects the system will become more unaffordable, and with the budget overloaded with debt, the persistent corporate dream of partial, or full privatization beginning with an "Intergovernmental Agency" will become a reality, ending Portlands's sole public ownership of our water supply.

Bull Run treatment plant and buried tank CONSULTANT CONTRACT history: Source: Oregon Public Record requests 2002- present. Study contracts 1995 to 2005 were awarded without transparency or any public process
1989--1993 Montgomery, Watson Bull Run Water Treatment Study (Joe Glicker was not yet employed by MWH)

1995 ——— 2004 (9-year contract) Joe Glicker, MWH **Powell Butte Master Plan** contract outlines plans for multiple buried tanks, treatment plant.

1995 ——— 2003 (8-year contract) Joe Glicker, MWH **Open Reservoir Study** contract (Amended and extended 8 times)

1997 ——— 2000 (end date unknown) J. Glicker, MWH/ CH2M Hill **Infrastructure Master plan** contract - Build UV Radiation plant first, then Membrane Filtration plant, plus bury multiple tanks.

1997 ——— 2003 (5-year contract) Joe Glicker, MWH (secret) Federal Regulation contract (LT2) - negotiate EPA "public health" regulations.
(Rhodes Trussell, a 32-year MWH CEO served on EPA's Science Advisory. Many now think LT2 based on flawed science.)

1999 ——— (end date unknown) J.Glicker, MWH **Regional Transmission and Storage Strategy** - (Corporate vison for Portland water to create an "Intergovernmental agency" change Bull Run ownership, add treatment plants, bury multiple tanks, and build a regional "blendcenter" to mix Columbia River, and Willamette River water with Bull Run water).

2001 ——— 2005 (4-year contract) J. Glicker, MWH **Bull Run Treatment Panel** -18-month 2001 panel, controlled process; produced report.
Panel ran for 18 months, contract four years. Panel concluded treatment not likely to add measurable public health benefit.

2003 ——— 2004 J. Glicker, MWH **Tabor Reservoir Burial** contract- Terminated in 2004. After Reservoir Panel (Independent Review Panel) did not support reservoir burial. Supported enhanced open reservoir security, and reservoir maintenance. Since then, $45 million spent for reservoir upgrades.

2004--------? CH2M Hill Professional Services- Flexible Contract- Water Treatment- Provide summaries of potential health effects for various treatment options, assist in collecting and organizing tech information to be made available to the public on website, design web pages, specialized inspection services related to water treatment, such as inspection of chemical tank interiors and hazardous-area ventilation systems.

Consultant Joe Glicker moved from Montgomery, Watson, Harza Global (MWH) to CH2M Hill in 2006; consultant contracts followed him to CH2M Hill.

2007 ——— 2010 CH2M Hill LT2 related **UV Radiation Plant** pre-design work ***hidden*** under "**Water Main" Flexible Service** contract. Providing unfair insider advantantage for larger UV design contract.

2009 ——— 2012 CH2M Hill LT2 **Powell Butte II Buried Tank Design** (J. Glicker handled Powell Butte 2003 land use with requirement that any tank built must be started by 2013.)

2009 ——— (end date unknown) CH2M Hill LT2 Bull Run **source water "Variance Track"** contract (Conflict of interest - CH2M Hill working on both "build" track and alternative "variance" track.)

March 2010 ——— Oct., 2013 (3.5 year contract) MWH LT2 **Kelly Butte buried storage tank** --as Mt Tabor reservoir replacement.

May 2010 ——— Dec. 31, 2014 (4.5 year contract) CH2M Hill LT2 **Bull Run Watershed UV Radiation Treatment Plant Design**

2010 ——— 2013 CH2M Hill **Flexible Service contract** project list **undisclosed**; includes $$ for public relations

For background details on cozy consultant contract history see: http://www.friendsofreservoirs.org/background.html
Other major capital projects not noted here have flowed to the same consultant/corporation. The community has not been allowed to determine what goes into the PWB's Capital Program;
In almost every case above, Public Involvement, if any at all, took place only ***after*** corporate contracts were awarded.

Dec, 2010

Exhibit 19

From:	Akagi, Yone
Sent:	Wednesday, February 08, 2012 12:36 PM
To:	'pwb.treatment-variance@state.or.us'
Cc:	Kari Salis; Carrie Gentry; Shaff, David; Campbell, Edward; Wanner, Chris; Giani, Rich; Richter, Ann
Subject:	OHA Notice of Intent to Grant Variance - PWB comments regarding recent Cryptosporidium testing results
Attachments:	PWB-Comments-NOI-CP2.pdf

Dear Ms. Shibley:

On behalf of the Portland Water Bureau, please find PWB's comments regarding the recent Cryptosporidium testing results in the attached document.

Thank you again for the opportunity to submit comments.

Sincerely,

Yone Akagi

Yone Akagi
Water Quality Compliance Manager
Portland Water Bureau
[redacted]

Phone: [redacted]
[redacted]
www.PortlandOregon.gov/water

PORTLAND WATER BUREAU
FROM FOREST TO FAUCET

Randy Leonard, Commissioner
David G. Shaff, Administrator

1120 SW 5th Avenue, Room 600
Portland, Oregon 97204-1926
Information: 503-823-7404
www.portlandonline.com/water

An Equal Opportunity Employer

February 8, 2012

Gail R. Shibley, JD, Administrator
Oregon Health Authority
Office of Environmental Public Health
Drinking Water Program
800 NE Oregon St, Suite 640
Portland, OR 97232

Subject: Bull Run Variance – Comments regarding recent *Cryptosporidium* testing results

Dear Ms. Shibley:

In response to the reopening of the public comment period for the Bull Run variance, the Portland Water Bureau (PWB) would like to take this opportunity to provide the enclosed additional comments that address the recent *Cryptosporidium* testing results for your consideration. PWB previously submitted a detailed technical report to OHA on January 23, 2012 that included all of the available laboratory data and information and the surveillance activities that were undertaken as a response.

Thank you for your agency's continuing efforts on this matter. Please do not hesitate to contact me with any questions or follow-up.

Sincerely,

David G. Shaff, Administrator
Portland Water Bureau

Enclosure

Portland Water Bureau Comments on *Cryptosporidium* Testing Results

Following the December 30, 2011 detection of *Cryptosporidium* at the Bull Run raw water intake, PWB submitted a technical report to OHA-DWP reviewing all of the available laboratory data and information and the surveillance activities that were undertaken as a response. [1] PWB would like to take this opportunity to provide additional comments regarding the recent detection.

As confirmed by Multnomah County Health officials, PWB strongly believes that the isolated detection of one oocyst at the Bull Run raw water intake does not represent a public health threat. Nor is it indicative of a change in the Bull Run watershed conditions that supported OHA-DWP's Notice of Intent to grant Portland a variance from the surface water treatment requirements of the LT2 Rule. While any detection of *Cryptosporidium* at the Bull Run raw water intake prompts increased vigilance, its significance can only be determined in conjunction with all other available information. Since the currently available disease surveillance and watershed data do not support the existence of a public health threat or any significant changes in the conditions in Bull Run, PWB believes that the recent detection should have no bearing on OHA-DWP's intent to grant a variance.

PWB offers the following comments in support of its view on the recent detection:

Comment #1: The *Cryptosporidium* concentration at the Bull Run intake remains below the EPA threshold of 0.000075 oocyst/L.

The detection of one *Cryptosporidium* oocyst at the Bull Run raw water intake represents an isolated event in 657 water samples totaling a volume of 15,882 L of water collected at the intake since PWB began intensive monitoring in support of the Variance Request in December 2009 (Table 1).[2] This means that the average *Cryptosporidium* concentration at the raw water intake is 0.000063 oocysts/L, which is below the threshold of 0.000075 oocysts/L established by EPA in the preamble of the LT2 rule as a criterion for a variance. Furthermore, the recent detection represents the first time that *Cryptosporidium* has been found at the raw water intake in nearly 10 years.[3]

---

[1] PWB *Cryptosporidium* detections – review of supplementary data and follow-up investigations was submitted to OHA-DWP on January 23, 2012.

[2] Number of samples and total volume are based on laboratory results from the Bull Run raw water intake from December 14, 2009 through February 1, 2012.

[3] Prior to the current detection, no oocysts had been detected at the Bull Run raw water intake since August 12, 2002.

Table 1: Summary of PWB's *Cryptosporidium* Monitoring at the Bull Run Raw Water Intake - LT2 Variance Request and Interim Monitoring Periods

Monitoring Period	Date Range	Number of Intake Samples	Total Sample Volume (L)	Number of *Cryptosporidium* Oocysts
LT2 Variance Request	Dec. 14, 2009 - Dec. 6, 2010	449	10,271	0
Interim[A]	Dec. 7, 2010 - Feb. 1, 2012	208	5,611	1
	Total	**657**	**15,882**	**1**
***Cryptosporidium* Concentration (# Oocysts/Intake Volume Since Dec. 14, 2009) = 0.000063 Oocysts/L**				

[A]PWB has sampled according to the interim monitoring plan since the end of the LT2 Variance Request monitoring period.

In response to the recent detection, PWB increased the monitoring frequency at the raw water intake to four times per week. Sample collection at the intake continued at this frequency during the recent switch to Portland's groundwater source prompted by elevated turbidity in the Bull Run source from January 21 through January 31, 2012. As of February 1, no further oocysts have been detected at the intake in 22 50-L samples collected since the positive result on December 30, 2011. The absence of any additional oocyst detections at the raw water intake despite the increased monitoring frequency provides confidence that the detection in late December was an isolated event, well within the expected bounds of a system with a very low level of *Cryptosporidium*.

During the interim monitoring period, PWB has continued to adhere to the highest data quality standards. Matrix spike samples are collected every four weeks to evaluate the performance of the method. This matrix spike frequency exceeds the minimum requirements of not less than 1 matrix spike per 20 field samples established by EPA Method 1623, providing added confidence in the on-going performance of the method. Matrix spike recovery results for *Cryptosporidium* during the LT2 Variance Request and interim monitoring period are summarized in Table 2. During both monitoring periods, the average *Cryptosporidium* recovery has remained within the EPA Method 1623 criteria of 13%-111%.

Table 2: Summary of PWB's Matrix Spike Recovery Results for *Cryptosporidium* at the Intake - LT2 Variance Request and Interim Monitoring Periods

Monitoring Period	Date Range	Number of Matrix Spike Samples	Average *Cryptosporidium* Recovery
LT2 Variance Request	Dec. 14, 2009 - Dec. 6, 2010	28	28.8%
Interim	Dec. 7, 2010 - Feb. 1, 2012	21	36.5%

Comment #2: Multnomah County disease surveillance showed no unusual increase in the incidence of cryptosporidiosis associated with the recent detection.

PWB contacted Multnomah County Health Department to review the recent available cryptosporidiosis disease surveillance data. The MCHD Communicable Disease Services Program Manager, Amy Sullivan, PhD, MPH, verified that there has not been a spike in cryptosporidiosis cases in Multnomah County and that there is no public health threat related to the December 30, 2011 detection of one oocyst at the raw water intake.

According to the Multnomah County Communicable Disease Reports, there were six case counts of cryptosporidiosis in December 2011 and five case counts from January 1-26, 2012. Dr. Sullivan confirmed that these levels are within the expected range based on historical data.[4]

Comment #3: PWB and public health experts concur that the public health risk from consuming Bull Run water remains very low.

PWB's Variance Request was based on monitoring results demonstrating that the risk of exposure to *Cryptosporidium* from Bull Run water is very low. As such, PWB is already meeting the stated public health goals of the Long Term 2 Enhanced Surface Water Treatment Rule (LT2 Rule). One oocyst detected during a monitoring program spanning over two years of intensive sampling (see Comment #1) does not represent a level of occurrence exceeding these public health goals.

As stated by participants of the Monitoring Expert Workshop convened by PWB on May 2 and 3, 2011:

> *A single detection of a small number of Cryptosporidium oocysts should not automatically terminate eligibility for the variance since the public health consequences of an isolated detection are not measurable. A better trigger…would be based on monitoring results which demonstrate a continued presence of human-infectious Cryptosporidium or signs in the community of waterborne disease transmission.*

PWB requested that David Spath, PhD, one of the members of the Monitoring Expert Workshop and the Public Health Expert Panel, provide a public health assessment of the recent detection. Dr. Spath worked for the California Department of Health Services from 1972 to 2005 and was chief of the department's Division of Drinking Water & Environmental Management. Based on his assessment of the available information,

[4] As of calendar year 2012, MCHD adopted a new case definition of cryptosporidiosis that may result in spurious increases in the number of reported cases. Despite this change, cryptosporidiosis levels reported for January 1-26, 2012 are comparable to levels reported for the same time period in previous years.

Dr. Spath concluded that the totality of monitoring results indicate that *Cryptosporidium* levels in Bull Run water continue to be very low and the public health risk associated with consuming Bull Run water, including the risk of *Cryptosporidium* exposure, remains negligible. Dr. Spath's assessment is included as Attachment 1.

PWB has informed OHA-DWP and Multnomah County Health Department (MCHD) officials of the initial lab results and follow-up monitoring results showing no additional detections. Neither agency indicated a concern regarding public health impacts. Portland drinking water consumers were not advised to take any precautions. PWB has been and will continue to be in consultation with the local health department as it continues to monitor at the raw water intake, pending a final order on the variance request.

Comment #4: The conditions in Bull Run offer a unique level of public health protection.

Due to the protected nature of the Bull Run watershed, wildife represent the only potentially significant source of pathogens. Molecular characterizations of the *Cryptosporidium* genus have shown that with few exceptions most species and genotypes tend to be host-adapted and only a small number of species from this genus have been associated with human infections. Since wildlife are the only likely source of *Cryptosporidium* in the Bull Run watershed, it is unlikely that any oocyst detected at the raw water intake would be from one of the two *Cryptosporidium* species that are the causative agent for the overwhelming majority of reported human cases. This is in stark contrast to water systems whose source water is impacted by human and agricultural waste.

EPA Method 1623, while designed for monitoring the occurrence of oocysts in raw water, has significant limitations as a tool for characterizing public health risk since it is unable to distinguish between specific species of *Cryptosporidium*. The detection of *Cryptosporidium* oocysts by Method 1623 does not equate with the detection of an agent capable of causing an infection in humans after exposure to low levels via drinking water. PWB and many experts in the field of *Cryptosporidium* believe that caution should be employed when attributing public health significance to samples that test positive for *Cryptosporidium* by Method 1623 in the absence of genotyping information.

As detailed in PWB's technical report, PWB attempted to genotype the positive sample at the intake (as well as the two positive samples collected from the South Fork of the Bull Run River at PWB Station 35 on 12/30/2012 and 1/5/2012). None of the samples amplified by polymerase chain reaction (PCR) and thus they were not able to be genotyped. PWB is researching options that may improve the genotyping success rate of its Method 1623 samples so that the most relevant information is available for making public health decisions.

Comment #5: PWB effectively implemented its proposed monitoring and management response strategies to protect public health.

As a condition of the variance, PWB proposed monitoring and management responses to a positive result intended to maintain exceptional public health protection against *Cryptosporidium*. During the recent detection, PWB effectively implemented the proposed response strategies providing confidence in PWB's capacity and willingness to respond to a positive result in a manner that is protective of public health.

Upon learning of the positive result at the Bull Run raw water intake, PWB immediately contacted OHA-DWP and MCHD to provide all available information of relevance for evaluating the public health significance of the *Cryptosporidium* detection. PWB has continued to provide OHA-DWP regular updates of monitoring results at the intake and throughout the watershed. A technical report reviewing all of the available laboratory data and information and the surveillance activities that were undertaken as a response was submitted to OHA-DWP and MCHD.

PWB increased the monitoring frequency at the intake to four times per week to better determine if the positive result was an isolated event or represented cause for concern.[5] PWB will continue to collect samples at the raw water intake at a frequency of four times per week until OHA-DWP issues a final order on the variance request.

PWB also responded with additional surveillance to investigate any potential causes for the positive sample and to provide additional information that could be used by PWB, OHA-DWP, and MCHD to evaluate the significance of the detection at the intake. Surveillance activities included the collection of additional water samples at locations in the watershed upstream of the intake to identify the extent of the presence of *Cryptosporidium* in the watershed. Since oocysts were only detected in upstream samples from the South Fork basin, additional surveillance activities were focused on this area of the watershed. Additional surveillance activities consisted of stream water quality monitoring, scat monitoring, and an inspection of the South Fork basin for any unusual conditions.

PWB's monitoring and management responses, as put into practice during the recent detection, have been effective at providing assurance that the recent detection of one oocyst at the raw water intake does not represent a significant deviation from the conditions in the Bull Run watershed that support public health in the absence of treatment for *Cryptosporidium*. PWB will continue to work with OHA-DWP and MCHD to refine these practices to ensure the highest on-going level of protection for PWB's drinking water customers.

[5] According to PWB's interim sampling plan, the monitoring frequency at the intake would be increased if the total oocyst concentration was above 0.000075 oocysts per liter (oocysts detected/liters assayed since December 2009). However, PWB made the change to increased monitoring to be consistent with OHA's proposed variance conditions as outlined in the November 29, 2011 Notice of Intent.

Attachment 1: Public Health Assessment, February 1, 2012, David Spath, PhD.

287 Purdue Avenue
Kensington, CA 94708
February 1, 2012

Yone Akagi
Water Quality Compliance Manager
Portland Water Bureau
1120 SW 5th Avenue
Portland, Oregon 97204-1926

Dear Ms. Akagi,

This is in response to your request for a public health assessment of the recent finding of a *Cyptosporidium* oocyst at the Bull Run raw water intake. That finding indicated a single *Cryptosporidium* oocyst was present in a 50 liter sample taken on December 30, 2011. Subsequent samples (12) taken at the intake from December 31 through January 18, 2012 were all negative.

Although the positive finding may be unsettling, it should not be considered unexpected. As the Public Health Panel, of which I was a member, convened by the Portland Water Bureau concluded, the probability of exposure to *Cryptosporidium* via consuming Bull Run water is expected to be low. As indicated by that conclusion, the Panel did not believe that there was no potential risk of exposure to *Cryptosporidium* associated with consuming Bull Run water; nor did it conclude that there was not the possibility of *Cyptosporidium* being present. Rather the Panel felt that the risk was not significant and additional treatment measures taken to further reduce very low levels of *Cryptosporidium* would not have meaningful public health results.

I believe that the overall monitoring results support the Panel's conclusions. Taken as a whole, the results indicate that *Cryptosporidium* levels are very low in Bull Run water. Most important is the fact that there were no additional *Cryptosporidium* detections at the intake subsequent to the December 30th detection even though water quality conditions (high turbidity) were worse than at the time of the positive sample. Certainly if there were significant levels of *Cryptosporidium* in Bull Run water, they would have been detected during that time period.

In conclusion, my assessment is that even with the recent *Cryptosporidium* finding the totality of the monitoring results indicate that *Cryptosporidium* levels in Bull Run water continue to be very low and the public health risk associated with consuming Bull Run water has not changed. In addition, the increased monitoring conducted subsequent to the finding was critical to providing a complete picture of the potential risk of *Cryptosporidium* exposure during the period of declining Bull Run water quality. The Portland Water Bureau should be commended for that response.

If you have any additional questions, please do not hesitate to contact me.

David P. Spath

David P. Spath, PHD

Exhibit 20

From: Theodora Tsongas
Sent: Wednesday, February 08, 2012 3:39 PM
To: pwb.treatment-variance@state.or.us
Subject: Comments on Notice of Intent to Grant Bull Run Variance - regarding new sampling results

February 8, 2012
To whom it may concern:
I am submitting these comments after reviewing the report on sampling results from late December and early January taken in the Bull Run watershed. These comments confirm my oral comments at the Oregon Health Authority's hearing on December 14, 2011. The results of the sampling serve only to point out that the EPA prescribed method 1623 is flawed, outdated and inadequate for the purpose of monitoring for Cryptosporidium. The so-called detections of Cryptosporidium, including the December 30th sample from the raw water intake, could not be uniformly confirmed as Cryptosporidium by the three laboratories and their experts. Method 1623 needs to be improved or replaced by a method that can be used to indicate a true public health threat. As it was implemented, and the results described in the Portland Water Bureau report, monitoring results using this method only served to raise public concern and fear without confirmation of a real health threat. Genotyping and confirmation of infectivity of Cryptosporidium oocytes to humans, supported by epidemiologic surveillance are necessary before initiating radical measures, such as building an unnecessary treatment plant, that could adversely impact our pristine watershed and the lives of ratepayers. Therefore, my support of a ten-year variance for the Bull Run water source remains quite strong. Thank you for the opportunity to provide comments on this vital issue. Please let me know that you have received these comments.

Theodora Tsongas, PhD, MS
Environmental Health Scientist
Portland, Oregon
[redacted]

Exhibit 21

From:	Regna Merritt
Sent:	Wednesday, February 08, 2012 4:32 PM
To:	pwb.treatment-variance@state.or.us; Dave Leland
Subject:	Comments (#2) on NOI by OHA to grant variance for Bull Run source water
Attachments:	Comments.pdf to OHA 2.8.2012 on Variance for Bull Run Source Water.pdf

Hi there,
Please find attached document containing our comments on the NOI to grant a variance for Bull Run source water.
Thank you,
Regna

Regna Merritt
Oregon Physicians for Social Responsibility
[redacted]

February 8, 2012

RE: Comments (#2) on OHA's Notice of Intent to Grant Variance to Bull Run Source Water

To Whom It May Concern,

Thank you for this opportunity to comment during the re-opened comment period. We stand in strong support of the Oregon Health Authority's intent to grant a ten year variance to the City of Portland for Bull Run source water.

Bull Run water was reported to have shown evidence of *Cryptosporidium* through Method 1623 testing in late December and early January. Follow-up analyses, performed by reference laboratories used for their technical expertise, were unable to uniformly confirm that *Cryptosporidium* was present. This episode highlights concerns we stated in our previous comments (January 3, 2012), and those expressed by experts working with the EPA, regarding the reliability of the only methodology approved by the EPA for testing for *Cryptosporidium* (Method 1623).

Even before it was known that the laboratories were unable to confirm or corroborate the presence of *Cryptosporidium* oocysts in Bull Run water, Dr. William E. Keene, senior epidemiologist at the Oregon Health Authority's Public Health Division, summarized his thinking on the matter on January 4, 2012 in an internal communication. There he wrote:

> "The finding of some kind of Cryptosporidium in Bull Run water does not come as a huge surprise. Indeed, most of the experts we have consulted have been surprised that PWB has not been finding it much more often than they have. Most studies find some Crypto in most watersheds most of the time---- often species that are of little significance to human health. This underscores why additional testing of these samples, including speciation (if feasible), and continued monitoring will help us achieve a better understanding of the occurrence of wildlife-associated Crypto in the watershed.
>
> These two positives do not in and of themselves suggest any imminent threat to human health, nor do they suggest any need for remedial action or heightened surveillance efforts. We encourage PWB to continue their program of sampling at Bull Run and sharing their results with the public. Area health departments will continue to monitor the reported occurrence of disease and will remain alert for any unusual incidence."
>
> In another internal communication, he notes that "the health threat is negligible."

We support his statements.

We incorporate by reference our comments submitted to OHA on January 3, 2012. (See Appendix 2.) Included in those comments is this statement:

> "We feel strongly that OHA language should include genotyping and determination of infectivity of any monitoring results that test positive for *Cryptosporidium* to determine the public health impacts or lack thereof. We believe that genotyping to determine whether any detections of *Cryptosporidium* in the Bull Run watershed are human-infectious species (from an oocyst with intact internal structure) would be essential to determine relevant public health implications, if any. Most cases of cryptosporidiosis are linked to two species of *Cryptosporidium*, *C. hominis* and *C. parvum*, which are associated with human and domesticated animal sources. (Both of these sources are generally prohibited in the Bull Run watershed and Bull Run Management Unit and these prohibitions are enforced.)"

Furthermore, we incorporate by reference the February 8, 2012 letter of Thomas T. Ward, MD sent to the OHA regarding his support for an OHA variance for Bull Run source water. Dr. Ward is employed by Oregon Health Sciences University, where he is Professor of Medicine, head of the Infectious Diseases Training Program and Chair of the Medical School Microbiology Course. He also serves as Board Director for the Research and Education Group (Portland's HIV community clinical research consortium) and is past President of the Oregon Infectious Diseases Society. (See Appendix 1.)

In closing, it's important to review basic facts. Portland has the most protected drinking watershed in the country. It is specifically protected from most infectious sources of *Cryptosporidium* (humans and domestic animals). In over one hundred years, there has never been any evidence of cryptosporidiosis infections originating in Bull Run water. Though genotyping (which we support) of samples taken on December 30, 2011 and January 5, 2012 was not possible, there is no evidence that the single oocyst or particle resembling an oocsyt found at the intake was capable of infecting anyone. So long as protections remain in place, Bull Run water is the safest in the nation. A treatment plant constructed to deal with a theoretical risk of cryptosporidiosis originating from this source would be a huge waste of precious and limited public resources.

Again, we remain in strong support of the intent of OHA to grant a variance for Bull Run source water.

Thank you for consideration of our comments.

Regna Merritt and Theodora Tsongas, PhD for Oregon Physicians for Social Responsibility

Floy Jones for Friends of the Reservoirs

Kent Craford for Portland Water Users Coalition Members:

ALSCO, American Linen Division
American Property Management
Ashland Hercules Water Technologies
The Benson Hotel
BOMA Portland
Darigold
Harsch Investment
The Hilton Portland and Executive Tower
Mt. Hood Solutions
New System Laundry
Oil Re-Refining Company
Portland Bottling
SAPA Inc.
Siltronic Corp.
Sunshine Dairy Foods
Vigor Industrial
Widmer Brothers Brewing
YoCream

Scott Shlaes for Oregon Wild

Bob Sallinger for Audubon Society of Portland

Alex P. Brown for BARK

Franklin Gearhart for Citizens Interested in Bull Run, Inc.

Ron Carley for Coalition for A Livable Future

Julia DeGraw for Food & Water Watch

David Delk for Alliance for Democracy

David Lorati for Central Eastside Industrial Council

Peter Stark for Hillside Neighborhood Association

Jeffrey Boly for Arlington Neighborhood Association

Stephanie Stewart for Mt. Tabor Neighborhood Association Land Use Committee

Steve Reinemer for South Tabor Neighborhood Association

Anne Dufay for SE Uplift Neighborhood Coalition for:

North Tabor Neighborhood Association
Mount Tabor Neighborhood Association
Montavilla Neighborhood Association
Sunnyside Neighborhood Association
Buckman Neighborhood Association
Hosford Abernathy Neighborhood Association
Richmond Neighborhood Association
South Tabor Neighborhood Association
Foster Powell Neighborhood Association
Creston - Kenilworth Neighborhood Association
Brooklyn Neighborhood Association
Reed Neighborhood Association
Eastmoreland Neighborhood Association
Sellwood Moreland Neighborhood Association
Woodstock Neighborhood Association
Mount Scott Arleta Neighborhood Association
Brentwood Darlington Neighborhood Association
Ardenwald - Johnson Creek Neighborhood Association
Kerns Neighborhood Association
Laurelhurst Neighborhood Association

Rod Daggett and Maxine Wilkins for Eastside Democratic Club

APPENDIX 1

February 8, 2012

RE: Comments on OHA's Notice of Intent to Grant Variance to Bull Run Source Water Under 42 USC 300g-4(a)(1)(B)

To Whom It May Concern,

I am writing to express my continued strong support of the Oregon Health Authority's intent to grant a ten year variance to the City of Portland for Bull Run source water.

The December 2011 City of Portland Water Bureau detection of Cryptosporidium-like organisms during routine screening, that could not be confirmed as cryptosporidium oocyts by each of the three reference labs, highlights the complexity of relying on current EPA approved methodology for monitoring the safety of our water supply, and on over reliance of microbiology surveillance in the absence of maximum use of supportive epidemiologic surveillance tools. That there is more "science" in laboratory-based testing versus traditional epidemiologic approaches has too often been a failed approach in past governmental responses, most recently highlighted by the German government response to a highly fatal series of food borne cases of E coli infection associated with renal failure.

In this regard, I would like to echo my support of Oregon Public Health Division's Dr. William Keene's statement on possible recent cryptosporidium detection that: "Area health departments will continue to monitor the reported occurrence of disease and will remain alert for any unusual incidence," and that recent events do not pose "any imminent threat to human health, nor do they suggest any need for remedial action or heightened surveillance efforts."

Again, I remain in strong support of the intent of OHA to grant a variance for Bull Run source water.

Thomas T. Ward, M.D.
Professor of Medicine
Oregon Health Sciences University
Head, Infectious Diseases Training Program
Chair, OHSU Medical School Microbiology Course

APPENDIX 2

January 3, 2012

RE: Comments on Portland Water Bureau's Request for Variance Under 42 USC 300g-4(a)(1)(B) and OHA's Notice of Intent to Grant Variance

To Whom It May Concern,

We strongly support the stated intent of the Oregon Health Authority (OHA) to grant a variance to the Portland Water Bureau from requirements of the Long Term 2 Enhanced Surface Water Treatment Rule (LT2) to additionally treat Bull Run source water. However, we request modifications and additions to OHA findings and changes to the OHA's proposed order regarding conditions.

The Bull Run is the most highly protected watershed in the nation and, as such, is at very low or no risk for contamination by human-infectious *Cryptosporidium* and other diseases and pollutants transmitted by humans and animals. Confidence in government at all levels appears to be waning. Your decision to grant a variance to the City of Portland, along with reasonable and rational conditions, can prevent the waste of hundreds of millions of dollars and help restore trust in government to make decisions based on sound science and not on emotion or fear.

1) We strongly support the Oregon Health Authority's general intent to grant a ten year variance.

We believe the Portland Water Bureau (PWB) has more than adequately demonstrated that the characteristics of the untreated source water are such that the additional treatment is not necessary.[1]

We note the following statements of fact:

a) "No outbreaks of cryptosporidiosis have ever been attributed to PWB drinking water as a source."

PWB Variance Request Section 5.4.1 p. 5-5

[1] Portland Water Bureau Treatment Variance Request, June 6, 2011, including Section 4 "Characterizing the Nature of the Bull Run Source Water"
http://www.portlandonline.com/water/index.cfm?c=54913&a=350653
and Section 5 "Local Public Health Data and Public Health Workshop"
http://www.portlandonline.com/water/index.cfm?c=54913&a=350654
See Appendix A of these comments.

b) "Adding additional water treatment to Bull Run is not likely to result in a measurable decrease in the occurrence of reported cases of cryptosporidiosis based on the current conditions characterized in the Bull Run."

PWB Variance Request Section 5.5.1 p. 5-9
PWB Public Health Expert Panel[2]
See Appendix A of these comments

c) "Water sampling data from Bull Run … has demonstrated compliance with the EPA standard of a maximum contamination goal of zero oocysts for *Cryptosporidium*. This result is consistent with the view that there is very low or no risk for *Cryptosporidium* contamination of our highly protected and geographically isolated Bull Run water source…"
"My strong opinion, based on available water quality and epidemiologic information is that our current Bull Run water source, storage and handling systems provide us with a safe water supply."[3]

Thomas T. Ward, MD[4]

We believe that a variance would not provide an unreasonable risk to public health. Indeed, denial of a variance may increase risk to public health.

If there were construction of another treatment system, there would be increased pressure to open the Bull Run Management Unit to logging, development and recreation. The argument: Why should these activities be prohibited if Portland's water is additionally treated? While now there is only a theoretical risk of cryptosporidiosis originating in Bull Run water, that could change over the long-term if a variance is denied, or issued and then revoked. If either were to occur, there would be more humans in the watershed and it would be more likely to see an

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[2] *Panel:* Jeffrey Griffiths, MD Tufts University
Scott Meschke PhD Microbiology University of Washington
David Spath PhD Civil and Environmental Engineering Consultant, formerly of California Department of Health Services
Thomas Ward MD Oregon Health and Science University
Marylynn Yates PhD Microbiology University of California Riverside
Panel Resources: Gary Oxman, MD Tri-County Health Officer (Multnomah, Clackamas, and Washington counties)
Amy D. Sullivan, PhD, MPH Communicable Disease Services Program Manager, MCHD

[3] From Letter of Dr. Thomas Ward to Portland City Council March 8, 2011
[4] Co-Director of Oregon Health Science University Medical School Microbiology Course, Director of the OHSU Infectious Disease Fellowship Training Program, Professor of Medicine at OHSU, Board Director for the Research and Education Group (Portland's HIV community clinical research consortium), past President of the Oregon Infectious Diseases Society.

increase in *Cryptosporidium hominis*, total and fecal coliforms, pharmaceuticals, etc. in Bull Run drinking water.

The history of logging in the Bull Run watershed highlights the unpredictable nature of economically and/or politically driven decisions regarding logging management. (See **7)** of these comments.) Current good intentions do not preclude future bad decisions related to logging and recreation management that could result from a decision to not grant the variance or to revoke the variance.

Construction of an additional treatment system could generate other risks to the Bull Run Management Unit and to public health. These include, but are not limited to, increased risk of construction-related fire in the geographically isolated watershed, introduction of pathogens and invasive species with increasing numbers of workers carrying contaminants into the watershed, accidental release of mercury into drinking water conduits with use of a UV treatment plant, potential for vaporization of mercury in a Bull Run treatment plant and delivery of mercury into drinking water, potentially harming workers and the public [5], and/or changes in water chemistry with new, daily exposures to plastic polymers, aluminum, acrylamide, etc. [6]

2) We support OHA's draft conditions regarding watershed control, stewardship and protection.

The Bull Run is the most highly protected watershed in the nation and, as such, is at very low or no risk for contamination by human-infectious *Cryptosporidium* and other diseases and pollutants transmitted by humans and animals. It is by maintaining and improving current restrictions on human entry, human activities and entry of domestic animals that we can continue to avoid transmission of human-infectious disease in Bull Run water.

3) We do not support OHA's draft conditions regarding monitoring.

Water sampling methods should go beyond Method 1623 to include verification (to include fully intact internal structure of an oocyst from a source infectious to humans), confirmation of infectivity, and genotyping. Otherwise, a single detection of an

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[5] *"Balancing Risk versus Benefit in the Selection of Equipment for Portland's Bull Run UV Disinfection Facility"* Bryan Townsend, Chad Talbot, Harold Wright, David Peters and Timothy Phelan
April 2011 IUVA News Vol. 13 No. 1 pp. 22-29
Retrieved from http://bojack.org/images/bullrunuvriskarticle.pdf

[6] Conventional Water Treatment: Coagulation and Filtration
Safe Drinking Water Foundation
http://www.safewater.org/PDFS/resourcesknowthefacts/Conventional_Water_Filtration.pdf

oocyst not pathogenic to humans could trigger the construction of an unnecessary treatment plant.

"Genotyping to determine whether any future detections of *Cryptosporidium* in the Bull Run source are human-infectious species is essential to determine the public health implications (if any)…. A single detection of a small number of *Cryptosporidium* oocysts should not automatically terminate eligibility for the variance since the public health consequences of an isolated detection are not measurable. A better trigger for terminating the variance would be based on monitoring results which demonstrate a continued presence of human-infectious *Cryptosporidium* or signs in the community of waterborne disease transmission."

PWB Monitoring Expert Panel [7]
PWB Variance Request Section 6.3.2 p. 6-5

4) OHA should acknowledge the flaws of Method 1623 and modify the draft monitoring conditions.

It is irrational for OHA to rely solely on Method 1623 to determine when increased monitoring should commence and/or that a variance may be revoked when a single oocyst is detected. At present, this test fails to genotype and to distinguish between 1) *Cryptosporidium* that is infectious to humans and not infectious to humans and 2) *Cryptosporidium* that is viable and that which is not. Water quality experts are working very hard to convince the EPA to correct this flaw. (See Water Research Foundation/American Water Works Association expert White Paper[8] and White Paper summary[9].)

From the White Paper summary: "Currently, U.S. Environmental Protection Agency (USEPA) methods 1622 and 1623 are approved for determining the occurrence of *Cryptosporidium* in untreated source waters and these methods provide the basic framework for characterizing risk under the LT2ESWTR. Since the inception of the LT2ESWTR, significant advances in both parasite molecular genetics and laboratory diagnostic methods have dramatically improved and expanded our knowledge of *Cryptosporidium* biology, creating a new knowledge base for understanding the risks that these parasites pose to public health. It is probable that application of this

[7] On May 2 and 3, 2011 the PWB convened this panel to examine various monitoring concepts and programs and "to help develop and evaluate monitoring elements that PWB may be required to implement should OHA-DWP grant a variance."
Panel: Jennifer Clancy PhD, Stephen Estes-Smargiassi MS, Eva Nieminski PhD, Paul Rochelle PhD, David Spath PhD

[8] "*Developing a Strategy to Increase the Value of Regulatory Cryptosporidium Monitoring: Cryptosporidium Detection Method Research Needs*
White Paper Based on an Expert Workshop in Golden, Colorado, August 5–6, 2008
See http://www.waterrf.org/ProjectsReports/PublicReportLibrary/4178.pdf

[9] Summary of above [Project 4178 Web-only] at
http://www.waterrf.org/ProjectsReports/ExecutiveSummaryLibrary/4178_NON_ExecutiveSummary.pdf

knowledge and the laboratory tools that have been developed will help inform risk management decisions. A coordinated effort is needed to consolidate and apply this knowledge and the laboratory tools into a regulatory framework for the water industry…"

"This white paper includes the following:
1. A review of the current state of knowledge of *Cryptosporidium* biology, which is critical for the evaluation of tools for effectively assessing risk of exposure associated with drinking water.
2. A discussion of genotyping, cell culture, and sample preparation methodologies, including viability and infectivity determinations, in the context of their readiness and robustness for application into future frameworks.
3. A summary of advantages and disadvantages of the above methods with respect to ease of use, practicality, quality assurance and quality control (QA/QC) issues, potential interferences, detection limits, and resolution (for genotyping methods).
4. Identification of analytical developments in the areas of sample collection, concentration, purification, and molecular tools that show promise for *Cryptosporidium* analysis."

From a 2008 article entitled: "*The Risk of Cryptosporidiosis from Drinking Water"*:

"The current methods of *Cryptosporidium* detection in untreated surface water (Method 1622 and 1623; USEPA, 2005) use an antibody based detection method to identify oocysts. This method only provides presence/absence detection of oocysts. The absence of sporozoites within the oocyst (determined by DAPI staining and/or DIC microscopy) suggests that the oocyst is not infectious but the presence of sporozoites does not mean that the oocyst is infectious to humans. An intact oocyst may not be *C. parvum* or *C. hominis* or the oocyst may be sufficiently damaged that it will not cause infection in humans. The detection of non-infectious oocysts or oocysts belonging to a species that is not infectious for humans could cause unwarranted concern for a contaminant that may not be a significant public health risk."[10]
We believe that OHA language should include confirmation by a second EPA-approved laboratory of any initial monitoring results from an EPA-approved

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[10] *The Risk of Cryptosporidiosis from Drinking Water*, p. 5
Anne M. Johnson Microbiologist Metropolitan Water District of Southern California,
Paul A. Rochelle Microbiology Development Team Manager Metropolitan Water District of Southern California
George D. Di Giovanni Associate Professor Texas AgriLife Research Center, Texas A&M University System, El Paso, TX
WQTC Conference Proceedings 2008 © American Water Works Association
Retrieved from
http://friendsofreservoirs.org/pipermail/reservoirs_friendsofreservoirs.org/attachments/20090903/efc4e349/attachment.pdf

laboratory that test positive for *Cryptosporidium*. Portland's Variance Request and the Monitoring Expert Panel[11] that convened to provide input on proposed monitoring conditions support this. Given the radical impact that detection of a single oocyst has on Portland's ability to maintain the variance, the panel advised PWB of the importance of establishing confirmation of any positive *Cryptosporidium* result at the raw water intake through a secondary independent laboratory.

We feel strongly that OHA language should include genotyping and determination of infectivity of any monitoring results that test positive for *Cryptosporidium* to determine the public health impacts or lack thereof. We believe that genotyping to determine whether any detections of *Cryptosporidium* in the Bull Run watershed are human-infectious species (from an oocyst with intact internal structure) would be essential to determine relevant public health implications, if any. Most cases of cryptosporidiosis are linked to two species of *Cryptosporidium*, *C. hominis* and *C. parvum*, which are associated with human and domesticated animal sources. (Both of these sources are generally prohibited in the Bull Run watershed and Bull Run Management Unit and these prohibitions are enforced.)

"Molecular epidemiology is being used increasingly to understand pathogen transmission patterns, detect outbreaks, and identify important risk factors and outbreak sources." **[12]** If the Centers for Disease Control and Prevention (CDC) values and utilizes molecular epidemiologic tools, why should not the OHA include the use of the same tools in its conditions for monitoring Bull Run water?

"In addition, bolstering waterborne disease surveillance can promote prevention and control. For example, given that *Cryptosporidium* is the primary etiologic agent of recreational-water associated outbreaks and has the ability to cause communitywide outbreaks, CDC should systematically collect stool specimens and utilize molecular epidemiology tools to subtype isolates to help elucidate the epidemiology of cryptosporidiosis**."** [13]

The value of molecular subtyping of *Cryptosporidium* isolates was underscored in Oklahoma in July, 2007 when it enabled public health officials to determine that two distinct outbreaks of cryptosporidiosis had occurred in neighboring counties during the same month. This process distinguished between *C. hominis* and *C. parvum*

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[11] On May 2 and 3, 2011 the PWB convened this panel to examine various monitoring concepts and programs and "to help develop and evaluate monitoring elements that PWB may be required to implement should OHA-DWP grant a variance."
Panel: Jennifer Clancy PhD, Stephen Estes-Smargiassi MS, Eva Nieminski PhD, Paul Rochelle PhD, David Spath PhD

[12] CDC Morbidity and Mortality Weekly Report Surveillance Summaries , p. 4
Vol. 60 No. 12 September 23, 2011

[13] Ibid p.29

infections originating in different recreational waters. " [14] Without use of these tools, it might have been presumed that there was a single source and type of infection.

Given the sad state of the only EPA-approved method for sampling for *Cryptosporidium*, we do not support a MCL of zero and we do not believe that a single detect (which may or may not be infectious to humans) necessarily indicates a public health concern.

For the above reasons, we do not support a public notification requirement for a simple detection of an oocyst through current Method 1623. We cannot overstate: There is no reason to create public fear when "an intact oocyst may not be *C. parvum* or *C. hominis* or the oocyst may be sufficiently damaged that it will not cause infection in humans. The detection of non-infectious oocysts or oocysts belonging to a species that is not infectious for humans could cause unwarranted concern for a contaminant that may not be a significant public health risk."[15]

Additionally, we believe that OHA language should include the option for the PWB to use ten liter samples. The ability to use 10 liter samples enables continuity of the intake *Cryptosporidium* monitoring data.

5) We request that the variance findings include an acknowledgement that Method 1623 is outdated, that the LT2 Rule is faulty, and both are now in the process of being reviewed and revised by the EPA. We also request that OHA proposed monitoring conditions be modified to reflect this information as well.

a) Method 1623 is currently under review.

See "Notice of a Public Meeting on Long Term 2 Enhanced Surface Water Treatment Rule: Initiate

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[14] Ibid Appendix B: Descriptions of Select Waterborne Disease Outbreaks Associated with Recreational Water Use", p. 36

[15] *The Risk of Cryptosporidiosis from Drinking Water*, p. 5
Anne M. Johnson Microbiologist Metropolitan Water District of Southern California,
Paul A. Rochelle Microbiology Development Team Manager Metropolitan Water District of Southern California
George D. Di Giovanni Associate Professor Texas AgriLife Research Center, Texas A&M University System, El Paso, TX
2008 © American Water Works Association WQTC Conference Proceedings

Regulatory Review – Cryptosporidium Analytical Method Improvements and Update on Source Water Monitoring" [16]

b) Monitoring indicates *Cryptosporidium* threat is lower than thought.

From American Water Works Association (AWWA) December 13, 2011[17]

"At a stakeholder meeting Dec. 7 on the Long-Term 2 Enhanced Surface Water Treatment Rule (LT2), the US Environmental Protection Agency presented preliminary data suggesting that *Cryptosporidium* is less prevalent in drinking water supplies than anticipated by the current rule…One agency conclusion is that the lower level of observed occurrence appears to be real and not due to a systematic change in recovery." See Appendix B of these comments.

c) AWWA and others state significant concerns with Method 1623.

They and we want concerns addressed, including:

- "Consider… modifying the monitoring in a way that provides more value to water systems and informs health risk reduction.
- Identify opportunities to reduce costs where possible.
- Genotype positive samples, which would be informative.
- Consider improved accuracy of the analytical method and the implications for treatment requirements, if USEPA is going to pursue improved oocyst recovery. "

See Appendix B of these comments.

d) AWWA states significant concerns with the LT2 rule.

The flawed Method 1623 adversely affects the entire LT2 rule. Alan Robertson, AWWA director of regulatory relations has stated: "Pursuing changes to LT2ESWTR construct is akin to pulling a thread on a sweater in that changing one aspect of the rule rapidly impacts other elements of the rule construct in a cascade of interwoven dependencies." See Appendix B of these comments.

e) The LT2 rule is currently under review.

"EPA plans to review the LT2 regulation as part of the upcoming Six Year Review process using the protocol developed for this effort. As part of the review, EPA would assess and analyze new data/information regarding occurrence, treatment, analytical methods, health effects, and risk from all relevant waterborne pathogens to evaluate whether there are new or additional ways to manage risk while assuring equivalent

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[16] 76 FR 71560 **http://www.gpo.gov/fdsys/search/pagedetails.action?granuleId=2011-29776&packageId=FR-2011-11-18&acCode=FR**

[17] American Water Works Association, Streamline, Volume 3, Number 28 December 13, 2011 See Appendix B of these comments.

or improved protection…Also, EPA intends to explore best practices that meet the SDWA requirements to maintain or improve public health protection for drinking water, while considering innovative approaches for public water systems."[18] LT2 review is one of 16 early actions that are intended to yield in 2011 a specific step toward modifying, streamlining, expanding, or repealing a regulation or related program. [19] "EPA plans to conduct this review expeditiously to protect public health while considering innovations and flexibility as called for in EO 13563."[20]

6) While the OHA has stated that economic arguments can not be used in determining whether or not a variance is granted, we believe the OHA must consider cost and net benefits, performance objectives, alternatives, innovation, flexibility, scientific and technological objectivity, and plain common sense while setting final conditions for the proposed variance.

Here we refer to the EPA's August 2011 **"Criteria for Regulatory Reviews". [21]** Our comments here are shaped by those criteria. *President Obama's Executive Order 13563* led the EPA to designate the review of the LT2 rule a priority and one of 16 "early actions" that are intended to yield, in 2011, a specific step toward modifying, streamlining, expanding or repealing a regulation or related program.[22]

Least burden?

The proposed conditions have a huge impact on small and large businesses, and should be changed to reduce the impact while maintaining public health and environmental protection. Costs for proposed monitoring conditions are extremely high at a time when poverty and unemployment in our community are also extremely high. Ratepayers and business owners large and small are adversely affected. Their participation in our coalition is evidence of that.

Feasible alternatives to the proposed conditions exist that could reduce the proposed burden on OHA and local governments without compromising public health and environmental protection.

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[18] *Improving Our Regulations: Final Plan for Periodic Retrospective Reviews*, Section 2.1.9, p. 25 U.S. Environmental Protection Agency August 2011 http://www.epa.gov/improvingregulations/documents/eparetroreviewplan-aug2011.pdf

[19] ibid Section 2.1, pp. 17-18

[20] ibid Section 2.1.9, p. 24

[21] ibid Section 4.2, pp. 52-55

[22] ibid Section 2.1, pp. 17-18

Net benefits?

It is feasible to alter the proposed monitoring conditions to include verification and genotyping, for example, to achieve greater cost effectiveness while still achieving the intended public health and environmental results.

Performance objectives?

We believe the proposed monitoring conditions have complicated or time-consuming requirements, such as intensive monitoring, that may not be justified, and that there are feasible alternative compliance tools, such as the stewardship conditions combined with routine monitoring, verification and genotyping, that could relieve burden while maintaining public health and environmental protection. As previously stated, a single detection of an oocyst during routine monitoring should not trigger intensive monitoring, and a single detection of an oocyst during intensive monitoring should not trigger revocation of the variance.
Genotyping, cell culture, and sample preparation methodologies, including viability and infectivity determinations, will likely improve performance objectives.

Alternatives to direct regulation?

We believe a feasible non-regulatory alternative exists to replace some or all of the proposed monitoring conditions while ensuring that public health and environmental objectives are still met.

Quantified benefits and costs / qualitative values?

Proposed conditions exacerbate existing impacts and create new impacts on vulnerable populations such as low-income or minority populations, children, or the elderly.

High impacts from rate increases associated with unnecessary LT2 project(s) in Portland will harm vulnerable populations. The LT2 regulation has already exacerbated existing rate impacts and created new impacts on vulnerable populations by forcing rate increases to pay millions of dollars for the design of a Bull Run source water treatment plant that we believe to be wasteful and unnecessary.

Further increases in utility rates lead to further reduction in services for low income citizens. (See Appendix C of these comments to read about potential impacts to vulnerable populations served by Sisters of the Road and the Portland Housing Authority, for example.)

The cost of building an additional source water treatment plant or paying for excessive monitoring is of great concern at any time, but is particularly painful during these economic times. Portland and its residents have real and critical public health and safety needs that must be met. Additional treatment for Bull Run source water is not a true public health and safety need. (See Appendix A of these

comments.) Additionally, we find that the proposed monitoring conditions are not based on a true public health and safety need.

There are feasible changes that could be made to proposed conditions to better protect vulnerable populations.

Benefits justify costs?

The benefits of OHA's proposed conditions do not justify the costs.

Innovation?

We believe there are feasible changes that could be made to the proposed conditions to promote economic or job growth without compromising public health or environmental protection.
New or less costly methods, technologies, and/or innovative techniques have emerged that would allow the Portland Water Bureau to achieve the intended public health and environmental results more effectively and/or efficiently. These include verification, genotyping, molecular techniques, cell cultures, and sample preparation methodologies, including viability and infectivity determinations.

Flexibility?

Conditions should allow for greater flexibilities to encourage innovative thinking and identify the least costly methods for compliance.

Scientific and technological objectivity?

The science of risk assessment has advanced such that the adverse impacts (including the high costs) of proposed monitoring conditions on affected populations such as low income communities, vulnerable populations, children and the elderly could be reduced more effectively than through methods proposed by OHA.
The underlying scientific data has changed since this LT2 regulation was finalized. These changes support revision to the rule and to the monitoring conditions proposed by OHA.
The monitoring conditions currently proposed by OHA are not supported by recent developments in the science. Method 1623 requires out-of-date methods that do not protect public health. (See **4)** and **5)** of these comments.)

7) We request a correction in Notice of Intent, Finding #39 on page 11.

It is important that decision-makers have an accurate appreciation of past decisions,

policies, law and practices related to logging and human entry in the original Bull Run Reserve, the Bull Run watershed and the Bull Run Management Unit. Those who drink and use Bull Run water enjoy the results of unique protections and watershed controls.

The Bull Run water source has provided excellent and safe drinking water to residents of Portland and many other communities since 1895. The main Bull Run watershed has been closed to human entry for over 100 years. The fact that Bull Run continues to provide Portland families with clean drinking water over a century later is no accident-- it is the result of decades of hard work by citizen advocacy groups, elected officials and water providers. *Consistent water purity is a direct result of the watershed's isolation from human entry and development and the exclusion of livestock and domesticated animals.*

In 1892, President Harrison's proclamation established the Bull Run Reserve. Wary of waterborne diseases like cholera and typhoid, Portland residents turned away from contaminated water supplies in town and towards an isolated watershed that could be fully protected from human entry, human waste, development, domestic animals and their diseases.

In 1904, Congress adopted the Trespass Act, which through prohibitions on human entry and the grazing of domestic animals effectively kept logging, development and disease out of the Bull Run watershed. The protected area included a huge forested zone well beyond the ridgelines that define the drinking watershed. As noted by the PWB, "The original Reserve boundary included not only the 102-square-mile water-supply drainage, but an additional 117 square miles of land surrounding the drainage—a visionary action…"

In 1977, Congress passed Public Law (PL) 95-200, establishing the Bull Run Management Unit, shrinking the boundaries of the protected area, opening the Bull Run watershed to logging and opening the adjacent Little Sandy River watershed to human entry, recreation and logging. By 1993, more than 350 miles of roads--most to facilitate logging--were built in the main Bull Run watershed, causing sediment to flow into drinking water reservoirs. Some 37 percent of the Little Sandy watershed was clear-cut.

In the 1990's, when polluted run-off from road building and logging operations threatened to foul Bull Run water, citizens, conservationists, businesses and community organizations pushed the city of Portland to take a stand, stop these destructive projects, and work with Congress to once again protect the watershed and the forests surrounding it.

In 1996, we won passage of the Oregon Resources Conservation Act in Congress, which modified PL 95-200, adding a general prohibition on logging in the Bull Run watershed. With a decrease in the number of (loosely supervised) people entering the forest to plan, execute and mitigate logging sales, there was a parallel decrease in the risk of direct delivery of *C. hominis* to the drinking

watershed.

In 2001, Congress adopted the Little Sandy Protection Act, expanding the size of the Bull Run Management Unit to include the Little Sandy watershed upstream of Aschoff Creek. It returned much of the "buffer" area south of the drinking watershed to the protected status originally established over 100 years earlier.

The Act stopped commercial and non-commercial logging. Slash burn fires, which often follow logging operations, ceased. The legislation prohibited all recreational use, including but not limited to campfires and use by equestrians, hikers, bikers, campers, hunters, and off highway vehicular riders. The closure of this "buffer" area dramatically reduced the risk of human-caused fire in the Little Sandy and the adjacent Bull Run main watershed.

It also greatly reduced potential for illegal entry into the main Bull Run watershed, substantially decreasing the potential for delivery of *C. hominis* to the drinking water supply.

Thank you for consideration of our comments. Today you have an historic opportunity to restore rationality to public health decisions and responsibility to our fiscal management. We strongly support a ten year variance for the City of Portland. We strongly request modifications to proposed conditions (as stated above) in recognition of the fact that the Bull Run is the most highly protected watershed in the nation and, as such, is at very low or no risk for contamination by human-infectious *Cryptosporidium* and other diseases and pollutants transmitted by humans and animals.

We strongly recommend that the OHA and the EPA focus agency expertise and precious, limited public resources on the safety of water found in unprotected, polluted, high-risk and medium-risk areas in Oregon, Region 10 and around the country.[23]

Sincerely,

Regna Merritt and Theodora Tsongas, PhD for Oregon Physicians for Social Responsibility

Floy Jones for Friends of the Reservoirs

[23] CDC Morbidity and Mortality Weekly Report Surveillance Summaries
Vol. 60 No. 12 September 23, 2011
http://www.cdc.gov/mmwr/pdf/ss/ss6012.pdf

Kent Craford for Portland Water Users Coalition Members:

ALSCO, American Linen Division
American Property Management
Ashland Hercules Water Technologies
The Benson Hotel
BOMA Portland
Darigold
Harsch Investment
The Hilton Portland and Executive Tower
Mt. Hood Solutions
New System Laundry
Portland Bottling
SAPA Inc.
Siltronic Corp.
Sunshine Dairy Foods
Vigor Industrial
Widmer Brothers Brewing
YoCream

Scott Shlaes for Oregon Wild

Bob Sallinger for Audubon Society of Portland

Alex P. Brown for BARK

Franklin Gearhart for Citizens Interested in Bull Run, Inc.

Ron Carley for Coalition for A Livable Future

Julia DeGraw for Food & Water Watch

David Delk for Alliance for Democracy

David Lorati for Central Eastside Industrial Council

Peter Stark for Hillside Neighborhood Association

Jeffrey Boly for Arlington Neighborhood Association

Stephanie Stewart for Mt. Tabor Neighborhood Association - Land Use Committee

Anne Dufay for SE Uplift Neighborhood Coalition for:

North Tabor Neighborhood Association

Mount Tabor Neighborhood Association
Montavilla Neighborhood Association
Sunnyside Neighborhood Association
Buckman Neighborhood Association
Hosford Abernathy Neighborhood Association
Richmond Neighborhood Association
South Tabor Neighborhood Association
Foster Powell Neighborhood Association
Creston - Kenilworth Neighborhood Association
Brooklyn Neighborhood Association
Reed Neighborhood Association
Eastmoreland Neighborhood Association
Sellwood Moreland Neighborhood Association
Woodstock Neighborhood Association
Mount Scott Arleta Neighborhood Association
Brentwood Darlington Neighborhood Association
Ardenwald - Johnson Creek Neighborhood Association
Kerns Neighborhood Association
Laurelhurst Neighborhood Association

Rod Daggett and Maxine Wilkins for Eastside Democratic Club

Appendix A

PWB Public Health Expert Consensus Statement

On March 25, 2011, several public health experts [24] participated in a workshop at the Portland Water Bureau. The purpose of the workshop was for the invited experts to formulate an opinion on the soundness of PWB's decision to seek a variance to the LT2 rule from a public health perspective. [25] The panel discussed the data presented and asked questions of the PWB staff. After the workshop, eight consensus findings were developed by the panel based on the data presented.

1. Infectious disease surveillance in Multnomah County is excellent, at the top end of surveillance systems in the United States.

2. Availability of public health data is very good; it is comprehensive and targets sensitive population groups, such as persons with HIV/AIDS.

3. Based on the data presented, it appears that the majority of the reported cases of cryptosporidiosis in Multnomah County are sporadic in nature.

4. Based on the site-specific data for Multnomah County, there was no information which would suggest that drinking water has been a source of cryptosporidiosis. Reported rates of cryptosporidiosis are comparable to those seen elsewhere.

5. The Bull Run watershed is unique among watersheds. It is well-protected in ways that surpass that of other watersheds in the United States known to the panel, including those for other unfiltered utilities. Since human activity is highly restricted in the Bull Run watershed, it is most likely that any *Cryptosporidium* within the watershed is normally of animal origin.

6. The data collection effort the Water Bureau has undertaken for characterizing the amount of Cryptosporidium in the Bull Run watershed has been

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[24] *Panel:*
Jeffrey Griffiths, MD Tufts University
Scott Meschke PhD Microbiology University of Washington
David Spath PhD Civil and Environmental Engineering Consultant, formerly of California Department of Health Services
Thomas Ward MD Oregon Health and Science University
Marylynn Yates PhD Microbiology University of California Riverside
Panel Resources:
Gary Oxman, MD Tri-County Health Officer (Multnomah, Clackamas, and Washington counties)
Amy D. Sullivan, PhD, MPH Communicable Disease Services Program Manager, MCHD

[25] See PWB Variance Request June 6, 2011 Section 5, p. 5-9

extremely thorough.

7. Based on the data set the Portland Water Bureau has gathered, the probability of exposure to *Cryptosporidium* via consuming Bull Run water is expected to be low. In the absence of human intrusion into the Bull Run watershed, the probability of exposure to *C. hominis*, which is almost solely found in humans, would be even lower.

8. Adding additional water treatment to Bull Run is not likely to result in a measurable decrease in the occurrence of reported cases of cryptosporidiosis based on the current conditions characterized in the Bull Run.

Appendix B

American Water Works Association December 13, 2011[26]

Monitoring indicates Crypto threat lower than thought

At a stakeholder meeting Dec. 7 on the Long-Term 2 Enhanced Surface Water Treatment Rule (LT2), the US Environmental Protection Agency presented preliminary data suggesting that *Cryptosporidium* is less prevalent in drinking water supplies than anticipated by the current rule.

The data come from the initial round of monitoring under LT2. The meeting was held to review LT2 monitoring requirements prior to the second round of monitoring required by LT2 and to evaluate the LT2 in the next Six-Year Review cycle.

USEPA requested input from stakeholders on one specific issue: requiring analytical method improvements that would increase average oocyst recovery by 20 percent—from 40 percent to 60 percent. Based on source water conditions, some samples would be much more significantly affected than others.

"Pursuing changes to LT2ESWTR construct is akin to pulling a thread on a sweater in that changing one aspect of the rule rapidly impacts other elements of the rule construct in a cascade of interwoven dependencies," said Alan Roberson, AWWA director of regulatory relations. "For example, the change in the analytical method offered by EPA could result in an increased likelihood a water system would be required to install treatment based on the second round of monitoring and thus raise the question of whether bin boundaries [i.e., thresholds for additional treatment] should be shifted."

USEPA presented preliminary, summary statistics from the LT2 first-round monitoring, most significantly:

- More water treatment plants had all non-detects than anticipated, with 51 percent of water treatment plants (WTPs) reporting no detection.
- The average concentration of oocysts was 0.016 rather than 0.053 oocysts/L as anticipated.

Additional data show

- There were more non-detects and conversely fewer detects than anticipated (93 percent of samples were non-detects).
- Fewer source waters than anticipated had mean concentrations greater than 0.075 oocysts/L — meaning that no additional treatment is required.
- As system size decreased, smaller systems were more likely to observe oocyst levels greater than 0.075 oocysts/L.

[26] American Water Works Association, Streamline,
Volume 3, Number 28 December 13, 2011

One agency conclusion is that the lower level of observed occurrence appears to be real and not due to a systematic change in recovery. The agency has not decided how it will determine whether any changes are needed in the rule.

During the stakeholder meeting, USEPA pointed out several aspects of LT2ESWTR requirements:

- The current LT2ESWTR second round monitoring requirements do not provide for submittal of grandfathered data.
- The current LT2ESWTR treatment requirements do not specifically address what a system will have to do if Round 2 monitoring finds a lower level of *Cryptosporidium* oocysts in a water treatment plant's source water that would place a water treatment plant in a lower treatment regimen.

AWWA and other stakeholders brought up important concerns to be addressed:

- Consider either dropping Round 2 monitoring or modifying the monitoring in a way that provides more value to water systems and informs health risk reduction.
- Identify opportunities to reduce costs where possible.
- Genotype positive samples, which would be informative.
- Consider improved accuracy of the analytical method and the implications for treatment requirements, if USEPA is going to pursue improved oocyst recovery.

USEPA intends to release a redacted dataset from the Round 1 monitoring, but officials did not say when it will be released and what data will be withheld.

"AWWA will need to elicit additional discussion of LT2 Round 1 data analysis," said Roberson.

The agency anticipates a meeting in the spring of 2012 to discuss uncovered finished water storage and other LT2ESWTR topics.

Appendix C

High impacts from rate increases associated with unnecessary LT2 project(s) and/or onerous monitoring conditions in Portland will harm vulnerable populations

The LT2 regulation has already exacerbated existing impacts and created new impacts on vulnerable populations such as low-income or minority populations, children and the elderly. It has forced rate increases to pay millions of dollars for the design of a Bull Run treatment plant that we believe to be unnecessary.

A May 10, 2011 radio report by Joe Meyers illustrated the heavy impacts of potential doubling in water bills (including revenue to pay for construction and operation of a treatment plant for Bull Run source water and/or onerous monitoring conditions):

An increase in utility rates leads to a reduction in services for low income citizens.

Examples:
Dave Coffman: Sisters of the Road, Financial Manager

This organization runs a kitchen and has relatively high water use. Dave calculated that the projected increase in water rates would cost Sisters of the Road an additional $4-5,000 per year, the equivalent of serving 50 meals per month to folks in need.

[Sisters Of The Road is about building community and creating systemic solutions to homelessness and poverty. Sisters Of The Road, Inc. was incorporated in 1979 as a nonprofit restaurant in Portland, Oregon, open to the public and providing nourishing meals at little or no cost or in exchange for labor. Program services include the Cafe, Systemic Change, and Workforce Development.]

Dianne Quast: Portland Housing Authority, Director of Real Estate Operations

"For our rental properties, (except for two) the Housing Authority directly pays both the water and sewer bills. At same time, we have caps on what we can increase rents to for most of our properties. So the result is going to be that we are going to see a reduction in other services, in capital improvements, and general maintenance to absorb the additional costs for utilities. And so it's a huge hit.

We are a housing authority that houses people who are low income. That means that many of the people who come into our housing have an annual income of $17,000 or less. They are people who don't have a lot of discretionary money for spending. We

try to provide them with decent and safe and affordable housing. So when these kinds of increases hit, it just makes our job that much more challenging."

Exhibit 22

From: Bella Patheal-Centenera
Received: Wednesday, February 08, 2012 4:57 PM
To: pwb.treatment-variance@state.or.us
Cc: Mike Bussell; Fredianne Gray
Subject: Fw: EPA Comments
Attachments: EPA Comments_OHA-Cryptosporidium_2.7.12.docx

~~~~~~~~~~~~~~~~~~~~~~~~
From the Desk of:
Bella Patheal-Centenera
Office of Water & Watersheds
[redacted]
Fax #: [redacted]
e-mail: [redacted]
Teams: The Value of One the Power of Many

(See attached file: EPA Comments_OHA-Cryptosporidium_2.7.12.docx)
~~~~~~~~~~~~~~~~~~~~~~~~
From the Desk of:
Bella Patheal-Centenera
Office of Water & Watersheds
[redacted]
Fax #: [redacted]
e-mail: [redacted]
Teams: The Value of One the Power of Many

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 900
Seattle, WA 98101-3140

OFFICE OF
WATER AND WATERSHEDS

February 8, 2012

Ms. Gail R. Shibley, J.D.
Administrator, Environmental Public Health
Oregon Health Authority
800 N.E. Oregon Street, Suite 640
Portland, Oregon 97232

Re: Comments on City of Portland Bull Run Safe Drinking Water Act Variance in Regard to *Cryptosporidium* Detections

Dear Ms. Shibley:

On January 25, 2012, Oregon Health Authority reopened the public comment period on the Notice of Intent to grant a variance to Portland Water Bureau from the *Cryptosporidium* treatment requirements of the Long Term 2 Enhanced Surface Water Treatment Rule (LT2). This was prompted by recent testing of Bull Run water that revealed the presence of *Cryptosporidium*. The new public comment period provided an opportunity for all interested persons to submit comments by February 8, 2012 on the newest information about *Cryptosporidium* testing results.[1] The U.S. Environmental Protection Agency (EPA) submits the following comments for OHA's consideration.

Background

On December 22, 2011, EPA submitted comments on the OHA Notice of Intent to grant a Safe Drinking Water Act variance to Portland Water Bureau.[2] After these comments were submitted, one *Cryptosporidium* oocyst was detected in each of two December 30, 2011, water samples taken by PWB. One sample was collected from the raw drinking water intake and the other was collected from PWB's Station 35 sampling site on the South Fork of the Bull Run River. Two additional oocysts were detected in one January 5, 2012, water sample collected from the same Station 35 sampling site.[3]

EPA's comments focus on two issues: criteria for a variance revocation and public information.

Criteria for Variance Revocation

[1] OHA News release, "Public comment period for Bull Run variance reopens", January 25, 2012.
[2] Letter to Gail Shibley from Mike Bussell dated December 22, 2011, available at OHA Hearing Officer Report at Exhibit 9.
[3] PWB Technical Report, "PWB Cryptosporidium detections – review of supplementary data and follow-up investigations", January 23, 2012.

Recommendation: EPA recommends that in addition to the general criteria proposed by OHA for variance revocation, OHA provide specific criteria in advance of variance issuance by which the variance will be continued or revoked. Such criteria might be based on *Cryptosporidium* oocyst concentration, statistical probability that oocyst concentration remains below some benchmark, or other specified conditions. EPA further recommends that if oocyst concentration or statistical probability are chosen as part of the criteria, OHA specify the calculations that will be used to make the determination.

Rationale: OHA's Proposed Order cites only general criteria by which the variance may be revoked. Among other things, the Proposed Order states only that the monitoring frequency must be increased if any one sample detects a presence of Cryptosporidium. In addition, if while on increased monitoring another sample detects a presence of Cryptosporidium, "OHA may revoke the variance." The Proposed Order does not specify, however, the circumstances under which revocation would be appropriate or the calculations that OHA would use in making that determination. Given the recent detections of oocysts, further specificity on the circumstances under which a revocation would be appropriate is important toward ensuring the protection of public health.

Public Information

Recommendation: EPA recommends that OHA incorporate a notification system by which PWB water consumers are periodically kept informed of OHA's perception of the degree of public health risk associated with the variance, based on the cumulative information available to OHA.

Rationale: EPA wishes to emphasize the importance of keeping the PWB water user community informed of the risks going forward, particularly for vulnerable populations.

EPA appreciates this opportunity to provide additional comments. We hereby reaffirm our offer of technical support. Should you have any questions, please feel free to call me at (206) 553-4198.

Sincerely,

Michael A. Bussell, Director
Office of Water & Watersheds