

# Security Issues / Mitigation Proposal

## Security

### 1) **What are the actual federal regulations related to security at Portland's open reservoirs?**

There is one existing federal regulation related to water security and one proposed federal regulation related to water safety:

A. Public Health Security and Bioterrorism Act of 2002: This Act requires Community Water Systems to perform risk analysis and develop contingency plans. Here communities are urged to consider relative risk. Based on the critical assets of the water system, one can determine the possible modes of attack that might result in consequences of significant concern. However, the objective of this step of the assessment is to move beyond what is merely possible and determine the likelihood to a particular attack scenario." [Emphasis added.] [1]

B. Long Term 2 Enhanced Surface Water Treatment Rule (proposed) aka LT2: "The proposed Rule requires that systems with uncovered finished water storage must (1) cover the uncovered finished water storage facility, or (2) treat storage facility discharge to achieve a 4 log virus inactivation [NOTE: this goal has already been met at the Mt Tabor and Washington Park reservoirs], unless (3) the system implements a State-approved risk mitigation plan that addresses physical access and site security, surface water runoff, animal and bird waste, and ongoing water quality assessment." [2]

### 2) **What are the Federal and State requirements for a "State-approved risk mitigation plan"?**

There are no EPA rules or other standards, which spell out specific requirements for lights, fencing, setbacks, security guards, or other elements. The only requirement is to have some kind of plan. The Federal rules compel specific action on only specific water quality risks: crypto, giardia, viruses, surface water runoff, animal and bird waste, certain environmental toxins, and disinfection byproducts. There is no federal or state mandate to construct defenses against bioterrorist attack. The proposed LT2 rule states merely that "access and site security must be addressed." Mr. Saltzman and Water Bureau officials have conceded that the proposed regulations give more flexibility than is depicted in the "Alternatives to Secure Storage" document that was developed by Kathryn Mallon of Montgomery Watson Harm. [3]

### 3) **What about those water quality issues? Do we have a problem?**

We presented evidence in a preceding section that there is, in fact, NO water quality

problem related to the open reservoirs, and that any needed enhancements to comply with the proposed LT2 rule (which, by the way, is in flux and should not be acted upon until the final version is known) can be done with inexpensive low-tech modifications.

**4) If there is no Federal mandate to construct defenses against bioterrorist attack, how should the City react to a perceived security threat it is under no Federal or State mandate to eliminate?**

Because resources are not infinite, it becomes a political issue to assess levels of relative risk and to decide what to do and how much to spend to achieve a desired level of risk mitigation. This inquiry should open this issue up to a broader line of questions like those that follow.

**5) If the City proposes to spend over \$100 million to defend the City against terrorists, how is this money best spent?**

The Water Bureau has commissioned three Risk Analyses, the most thorough of which [4] identifies many water-related vulnerabilities which present a more immediate risk than the theoretical risk of someone, somehow, deliberately contaminating a 50 million gallon (MG) body of water that turns over every 1-2 days. Even the most thorough risk analysis fails to put water issues into the broader City and Regional security context that, in turn, might give guidance in how to rank a broader range of risks. Such a broader assessment is necessary to guide the City in how best to use its limited resources.

**6) What other potential terrorist targets exist in the City and Region which may rank higher in likelihood of occurrence or ease of elimination?**

Set forth below is a short list of potential terrorist targets having an equal or greater risk of vulnerability;

- Minimally-protected chemical plants in North Portland (vulnerable to explosives and theft).
- Minimally-protected Bull Run conduits and trestles (vulnerable to explosives).
- PDX airport, where passengers and pilots must remove their shoes but vendors and maintenance people have free access to planes and tarmac (vulnerable to explosives and hijacking).
- The Water Bureau's own Bull Run Headworks, where low-tech thieves recently drove up in a pickup truck and hauled away computers and other equipment.

- Every rock concert, downtown 4th of July celebration, Blazers game, or other event where thousands congregate in a small, easily targeted space (vulnerable to explosives, and also the type of target most suitable for a chem-bio weapon).

There are other, more ordinary non-terrorist risks more likely to jeopardize community well being such as:

- obsolete, nonfunctioning fire hydrants throughout the city
- property crimes not prosecuted, convicted felons released prematurely due to lack of funds for courts and jails
- mentally ill adults and children living on the streets due to lack of treatment facilities and housing

**7) How easy would it be to dump some poison into our reservoirs and kill a lot of people?**

Here is what Jane's Information Group says in its *Chem-Bio Handbook*, "Contrary to reports in the general press, municipal water supplies are very difficult to contaminate so as to cause widespread casualties. Dilution and diffusion factors as well as chlorination combine to make this type of operation nonfeasible." [5]

**8) Where in the world has this kind of attack actually occurred?**

There has never been a successful biological or chemical attack on a municipal water supply, anywhere in the world. The list of actual chem-bio attacks of any kind is a short one and is included in an appendix.

**9) What is the most effective way to deliver a chem-bio poison, anyway? Is it through water?**

The aerosol route is by far the most effective and efficient way to deliver a biological or chemical poison. [5]

**10) What are the actual specific agents that theoretically could, in backpack-portable quantity, render lethal a 50 MG body of water that turns over every 1-2 days?**

This theoretical information is available on the Internet and is provided in your attachments. The list does NOT include anthrax, arsenic, or other conventional poisons because of the enormous quantities which would be required. The theoretical threat

boils down to a short list of exotic biological warfare agents, which can be produced only in a military-grade biological weapons laboratory.

To evaluate this theoretical risk, we invite you to ask these questions, and use the resources of the Reservoir Review Panel to get specific answers:

- What specific kind of manufacturing facility, and what kind of training, and what kind of handling would be needed, to actually produce each of these bio-chem warfare agents?
- What quantity of each agent would be needed for this kind of attack to be successful?
- What quantity could be feasibly produced? Has anyone ever produced such a quantity outside of a state-sponsored military biological weapons laboratory?

**11) Is this known to have occurred anywhere in the world, inside or outside of a state-sponsored military biological weapons laboratory?**

It is interesting to note that the Aum Shinrikyo organization of Japan, which launched the Sarin attack on the Tokyo subway, had enormous financial resources and had actually purchased a pharmaceutical manufacturing facility. Among its members were skilled technicians, including some trained in microbiology. They attempted to create weapons using anthrax, botulinum toxin, Q-fever, and even ebola. They made at least four separate attempts to use these agents, including anthrax once and botuhnum toxin three times. [6] These attempts all failed, and they ended up resorting to a nerve agent, Sarin, for their attack.

John V. Parachini, Senior Associate for the Center for Nonproliferation Studies, gave this testimony before the House Subcommittee on National Security, Veterans Affairs, and International Relations in October 1999. Parachini said, "In the Sarin gas attack...12 people eventually died and several hundred people suffered injuries from exposure, not the 5000 that is usually cited. More than 5000 people went to hospitals following the attack, but only a fraction of those people actually suffered from exposure to chemical agent. In contrast, 6 people died and more than 1000 were injured in the [first] World Trade Center bombing. 167 people died in the Oklahoma City bombing and several hundred were injured. The bombings of the US embassies in Africa resulted in 252 deaths and over 5000 injured." [7] Add to these numbers the 2000 people who died and the thousands more injured in the second Word Trade Center attack.

As Parachini reminded the congressional committee: ". . . given how vulnerable we believe we are to terrorist CBW [chemical-biological weapon] attacks, surprisingly few incidents have actually occurred and attacks with conventional explosives have been far more deadly." [Emphasis added.] Id.

The *Oregonian* reported in a recent article that David Franz, former commander of the U.S. Army Medical Research Institute of Infectious Diseases, said, "There's a lot of work done with toxins, but not as weapons. The Soviets dropped them and we dropped them. The Iraqis admitted (to U.N. inspectors) that they looked at them in the 1980s, but they dropped them?" [8]

**12) What about ricin? Isn't ricin supposed to be easy to make out of castor beans?**

So they say. If this poison were actually as easy to make as Internet accounts allege, or at all easy to deliver, we believe we would be reading about successful ricin attacks in the newspapers and surveillance literature. Instead we read about explosions. In fact, the *Oregonian* reported recently: "It [ricin] is also not effective as a contaminant of the water supply system." [8]

**13) What water security risks are NOT eliminated by the proposed burial of the Mt Tabor reservoirs and the floating covers on the Washington Park reservoirs?**

We can think of a few. You can ask for more. Access to the water and infrastructure supply would remain available to a determined attacker, despite these constructions. For example:

- 3 x 3 x 5 foot personnel access (two per cell), 5 x 5 x 5 foot equipment access hatches (two per cell), and vents (multiple), which are potential targets of attack, located in open parkland. Recently in El Paso two such hatches that were vandalized and the doors stolen. [9]
- Floating covers do not protect potable water. They pond polluted water on their surface, and attract birds and animals by providing a new habitat of shallow ponded water. They are prone to seam failure, which can suddenly introduce polluted water into the water beneath. They can easily be opened with a knife. Significant sanitary issues related to these covers were raised by the California Department of Health Services in 1997 in its publication "Sanitary Assessment of Flexible-Membrane Floating Covers for Domestic Water Reservoirs"[10]. A copy of this paper has been provided to your chairman for distribution to the Reservoir Review Panel. Images from this report are included in this section. Concerns raised by this report are the reason the City of Manhattan Beach, CA decided not to use floating covers to cover its reservoir in 1999. [11]
- Traditional armed attack or burglary at Headworks, Lusted Hill, or Powell Butte. Witness the recent break-in and theft of computers and other equipment at Headworks.

- Old-fashioned explosives placed at the bridges and trestles carrying the conduits could easily disrupt the distribution system.
- A backflow attack is a more Likely risk. Toxins can be introduced into the distribution system from any faucet or multiple faucets and then spread both downstream and laterally. This threat is repeatedly cited as a more credible risk than any attempt to poison open water reservoirs. As one expert observed:

‘The amount of material needed to deliberately contaminate a water source (such as a reservoir or aquifer) is large and generally exceeds what an individual or small group of terrorists could easily acquire, produce, or transport. However, contaminants introduced into a distribution system would be less susceptible to dilution and would reside in the system for shorter times, thus diminishing the effects of disinfection and chemical decomposition and oxidation.’ [12]

As Gay Porter DeNileon, a journalist who serves on the National Critical Infrastructure Protection Advisory Group, a water industry organization, wrote it in the May issue of the Journal of the American Water Works Association, ‘One sociopath who understands hydraulics and has access to a drum of toxic chemicals could inflict serious damage pretty quickly.’ [13]

“A small drop-off [in water pressure suggesting a backflow attack] would attract attention it wouldn’t have even a short time ago,” says Michelle Clements, a spokeswoman for Oregon’s Portland Water District, which serves 190,000 customers.” [13]

#### **14) Isn’t Portland a “target of opportunity” because it has uncovered finished water storage?**

Whether the water is finished or unfinished is irrelevant. Every open reservoir, containing finished or unfinished water, presents the same target of opportunity. This is because conventional treatment does not remove the exotic military-grade biological toxins which you are considering building a defense against. Therefore any body of water which ultimately feeds a municipal water supply, however far upstream, could be targeted with the same effect as targeting Portland’s reservoirs. Other “targets of opportunity” include Pittsburgh’s Highland Park #1 reservoir (where park users get closer to the water than in Portland), NY’s Hillview Reservoir (which is located next to a freeway), the unguarded reservoirs located in rural parkland above Colorado Springs (secluded and accessible by foot, bicycle, or horse), and innumerable other reservoirs supplying cities and towns across the country.

## Mitigation

### **15) What security-related measures do the Friends of the Reservoirs propose?**

We propose that the following represents more measured, cost-effective responses to the actual risks threatening our water's security:

- Other steps need to be taken before ratepayers' money is spent on counter-terrorist measures that 1) have no federal or state mandate, and; 2) would protect against a specific kind of attack that requires overwhelming technical expertise to perform and which has never been accomplished in world. These steps include, 1) performing a region-wide security assessment, 2) prioritizing the risks, 3) performing risk-benefit analyses, and then; 4) deciding what mitigation steps make economic sense. The Risk Assessment Reports commissioned by the Water Bureau to date leave out the important element of putting water risks into the larger context of all threats to community well being and health. Please refer to Appendix L.
- We believe that low-tech non-intrusive measures such as multiple infrared cameras, surveillance, and ultimately on-line quality monitoring, will address the negligible level of security risk represented by our open water. Infrared cameras have a huge advantage over ordinary cameras in that heat sources (such as people) are conspicuous. There should be no dead areas" unobserved by cameras, and there should be overlapping coverage. The security-camera program could be part of a larger Water-System wide security program to address surveillance of bridges and trestles, surveillance of vulnerable facilities such as Headworks or the treatment facility at Lusted Hill.
- Retain the strolling armed security guards, put them on City payroll to reduce costs, and improve training. We believe the physical presence of the strolling security guard has to date enhanced the Mt Tabor Park experience by eliminating flashers, rape attempts, and the like. They should, however, be better trained for emergencies, as the unfortunate episode of Glenn Behnke demonstrated.
- Build the bypass that was to have been completed in April 2003, so that the Mt Tabor reservoirs can be rapidly taken off line if needed.
- If deemed necessary, site access can be addressed with landscaping such as berms or modestly increasing setbacks. The City has already spent hundreds of thousands of dollars (ask them how much, it should be interesting) on a What-Goes-On-Top PAC and a design competition to address how to drastically change the landscape at Mt Tabor Park. How about buying some talent to consider how to gently modify the current landscape while reducing access and maintaining the current park experience?
- Perform delayed maintenance. Repairs to parapet walls, sidewalks, and pipes have

been delayed. We are unsure if this is because maintenance money has been diverted to replace money lost in the billing software debacle, or if the Water Bureau has embarked on a deliberate program of neglect so it can claim that the reservoirs are old and defunct.

**16) Are there other measures that should be taken so as to enhance water quality?**

Yes. There are at least three cost-effective measures that could be undertaken to improve water quality. These are:

- Do not act to implement the LT2ESWTR in its current form, because its assumptions, methods, and conclusions are being strongly contested by New York City and other large unfiltered systems like ours. The comments posted to EPA by NYC, the Unfiltered Systems Working Group, and the AWWA all indicate that the Rule as it applies to Portland is grounded on faulty assumptions and may be modified in the direction of allowing source water protection instead of treatment.
- Implement an intensive public education program to discourage bird feeding at Reservoir 6. There is no bird problem at Reservoirs 5 and 1, because the public does not feed birds there. Resume the bird trapping and transport program.
- Improve and stabilize Bull Run water quality by aggressively increasing the decommissioning of logging roads. Runoff from defunct logging roads is the major cause of the occasional turbidity events that necessitate switching from Bull Run to the Columbia South Shore Well Field.

**17) How would you summarize the Friends position regarding Portland's open water reservoirs.**

In short, we believe the following:

- Any security risk related to the reservoirs has been vastly overestimated because it has not been placed in a region-wide risk context. Moreover, the specific type of attack this project is intended to protect against is likely not possible or feasible,
- That there is no measurable water quality problem related to the existing reservoirs, and that the proposed Federal Rule is in flux and should not yet be acted upon.
- We believe the safety, reliability, and quality of our water can be enhanced by low-tech investments in security, maintenance, and public education.

## References

- [1] EPA 810-B-02-O01, Instructions to Assist Community Water Systems in Complying with the Public Health Security and Bioterrorism Act of 2002, January 2003, [www.epa.gov/safewater/security](http://www.epa.gov/safewater/security)
- [2] Federal Register Monday August 11, 2003, "Part II: EPA, 40 CFR Parts 141 and 142, National Primary Drinking Water Regulations: Long Term 2 Enhanced Surface Water Treatment Rule; Proposed Rule. Section IV, F.
- [3] Scott Learn, Many cities ditching open water reservoirs," The Oregonian, 10/15/03.
- [4] EQE International, Inc, System Vulnerability Assessment: Portland Bureau of Water Works, September 2000.
- [5] Who is the Jane's Information Group? From the website <http://www.janes.com>: "Jane's Information Group is a world-leading provider of intelligence and analysis on national and international defense, security, and risk developments. Jane's is an independent organization with an unrivalled reputation of accuracy, authority, and impartiality. Governments, militaries, business leaders, and academics in over 180 countries rely on Jane's providing timely and insightful information on threat and security issues."
- [6] Carus, W.S. The Threat of Bioterrorism, National Defense University Strategic Forum, no. 127, September 1997.
- [7] Parachini, J.W., Combating Terrorism: Assessing the Threat, statement to House Subcommittee on National Security, Veterans Affairs, and International Relations, October 20, 1999, published in CNS reports. Internet site: [http://cns.mfls.edu/iioplcnsdata?Action=1 &Concepto&Mime=1 &collection=CNS+Web+Site&Key=pubs%2Freports%2Fparach%2Ehtm&QueryTextbiological++weapons&QueryMode=FreeText](http://cns.mfls.edu/iioplcnsdata?Action=1&Concepto&Mime=1&collection=CNS+Web+Site&Key=pubs%2Freports%2Fparach%2Ehtm&QueryTextbiological++weapons&QueryMode=FreeText)
- [8] The Oregonian, Feb 4, 2004, "Ricin is effective killer but not on a widespread scale." p. A12
- [9] Borunda, D. Water safe after 2 city reservoir tanks vandalized. [elpasotimes.com](http://elpasotimes.com) News, 1-14-04.
- [10] California Department of Health Services, Sanitary Assessment of Flexible-Membrane Floating Covers for Domestic Water Reservoirs", February, 1997.
- [11] Greenwood, ID, and Guerrero, MA, Status Report on Peck Avenue Reservoir

Roof Replacement Project, Memorandum to Mayor and Members of the City Council, City of Manhattan Beach, February 16, 1999.

[12] Clark, RM and Ceininger, RA, 'Minimizing the vulnerability of water supplies to natural and terrorist threats,' American Water Works Associations IMTech Conference Proceedings, 2001.

[13] Dreazen, Y, "Backflow, water-line attack feared. Terrorists could reverse flow in system to introduce toxins." Wall Street Journal, 12-28-01.