



Testimony of Brad Coffey
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On Behalf of the
Association of Metropolitan Water Agencies

Before the
U.S. House of Representatives
Committee on Energy and Commerce
Subcommittee on Environment and Hazardous Materials

Hearing on
H.R. 5533, the “Chemical Facilities Act of 2008”
and
H.R. 5577, the “Chemical Facility Anti-Terrorism Act of 2008”

June 12, 2008

**Summary of Major Points of the Testimony of Brad Coffey
June 12, 2008**

- Local drinking water utility experts are best equipped to choose the most effective treatment methods and chemicals to disinfect drinking water supplies and protect public health.
- Since the passage of the Public Health Protection and Bioterrorism Preparedness and Response Act of 2002, drinking water utilities serving more than 3,300 customers have prepared vulnerability assessments and emergency response plans to identify and address any weaknesses in their security standards.
- The Metropolitan Water District of Southern California has thoroughly evaluated alternatives to its use of gaseous chlorine as a primary disinfectant, but has determined that the substance remains its best treatment option. The utility has also spent millions of dollars to upgrade the physical security of its chlorine supplies.
- A federally mandated transition from chlorine gas to an “inherently safer technology” would be infeasible for Metropolitan and many other drinking water systems, and would result in risk tradeoffs that could threaten public health. For this reason, the Department of Homeland Security, the Environmental Protection Agency, or any other federal agency must not be given the broad power to override local water disinfection choices.
- When evaluating potential “IST” measures, cost is not the primary consideration for drinking water utilities. Instead, local feasibility issues such as increased truck transport of chemicals, absence of chemical storage space at treatment facilities, increased saline discharges, supply chain concerns, and the disposal of new manufacturing byproducts such as hydrogen must all be considered.
- Some drinking water systems have evaluated their treatment options and successfully transitioned to a gaseous chlorine alternative. The government should encourage utilities to choose the most effective treatment option by offering grant assistance to help utilities update vulnerability assessments, enhance system security, or adopt new treatment technologies when feasible.
- Current law relating to drinking water systems’ vulnerability assessments is sufficient, but if Congress decides to impose new updating and reporting requirements on utilities, it must not impose duplicative and contradictory multi-agency requirements. It also must not impose broad “IST” mandates over water systems, and should include robust information protection provisions to ensure that critical utility security information is not made public.

Good morning Mr. Chairman, Ranking Member Shadegg, and distinguished Members of the Committee. My name is Brad Coffey, and I am currently the Water Treatment Manager at the Metropolitan Water District of Southern California (“Metropolitan”), where I oversee the operation and maintenance of five water treatment plants with a total capacity of 2.6 billion gallons per day. Four of the five plants are among the 10 largest in the nation and because of their size have unique and needs and challenges with regard to treatment drinking water supplies and protecting public health.

Metropolitan is a consortium of 26 cities and water districts that provide drinking water to nearly 18 million people over a service area of 5,200 square miles encompassing parts of Los Angeles, Orange, San Diego, Riverside, San Bernardino and Ventura Counties. Metropolitan’s five water treatment plants rely on liquefied chlorine gas to disinfect their source water, using approximately 9,000 tons of the chemical per year. Approximately half of this liquefied chlorine is delivered directly to treatment plants by rail, and the remainder is transloaded from railcars to truck trailers for delivery.

Today I am here on behalf of the Association of Metropolitan Water Agencies, or “AMWA,” which is an organization representing the largest publicly owned drinking water providers in the United States. AMWA’s members provide clean and safe drinking water to more than 127 million Americans from Alaska to Puerto Rico. In my testimony today, I will explain the rigorous review process through which Metropolitan has identified its most effective source water treatment methods, the robust security measures that have been put in place at our plants, and how drinking water utilities and the federal government can work together to ensure the protection of the nation’s drinking water supplies and necessary treatment chemicals.

Metropolitan's Security Evaluation and Enhancements

Since 9/11, Metropolitan Water District has been systematically evaluating and improving security systems and procedures at its water treatment plants and chemical unloading facilities where chlorine is stored. In 2003, as required by the Public Health Protection and Bioterrorism Preparedness and Response Act, Metropolitan completed a vulnerability assessment that identified further areas for improvement. Since then, we have upgraded our chemical safeguards in several ways, including:

- Developing chemical delivery security protocols for all chemicals;
- Increasing the presence of on-site security guards;
- Investing approximately \$120 million to implement stronger chlorine containment methods at all facilities;
- Ensuring that its chlorine facilities are within a multi-layered system of physical barriers with 24-hour guard patrols, camera observation, and electronic access controls; and
- Reducing the number of facilities that hold chlorine gas from 17 to 6.

In addition, in 2006 Metropolitan completed its most recent study evaluating potential alternatives to the utility's use of chlorine gas, such as on-site production of dilute hypochlorite solution and the purchase of commercial sodium hypochlorite. However, we ultimately concluded that chlorine gas remains our most reliable and effective water treatment choice.

Alternate Treatment Review: On-Site Generation or Commercial Hypochlorite

Currently Metropolitan uses liquefied chlorine gas for disinfection of its drinking water supplies. Using the Joseph Jensen plant as an example, I will provide a review of

two alternative strategies to the current practice of using liquefied chlorine gas: (1) onsite generation of dilute hypochlorite (bleach); and, (2) commercial delivery of industrial-strength hypochlorite.

The Joseph Jensen plant is the second largest plant in the country with a design capacity of 750 million gallons per day. For this review, it is assumed that the plant is operating at 615 million gallons per day, less than its design capacity but well within normal flows.

The first alternative strategy, on-site generation of dilute hypochlorite, would require a three-fold increase of either trailer or railcar deliveries to provide salt – the major raw material – for hypochlorite production. Unlike dry chlorine gas, manufacturing or purchasing bleach unavoidably adds other co-occurring constituents including salt, bromate, chlorate and perchlorate.

With on-site hypochlorite generation, most of the salt used ends up as a waste and results in significant increases in saline discharges from the plant. With salinity discharge limits established for many regional basins, the disposal of salt could be problematic and impact compliance for downstream users. Furthermore, the on-site generation of chlorine raises separate concerns about the generation and safe disposal of hydrogen gas as a chlorine generation byproduct. And, is it unlikely there would be sufficient space at each treatment plant (e.g., Jensen) to construct new chlorine generation facilities which would require vast amounts of softened water, electricity, backup electrical generators, and diesel fuel to provide reliability equivalent to our current practice of storing liquefied chlorine gas for 30 days (see attached chart). Finally, because of the complexity of the systems needed to support dilute bleach production, it is

unclear that on-site generation would be as reliable as the current process.

The second alternative is the commercial delivery of industrial strength hypochlorite. If this option were chosen, it would require a tremendous increase in the number of truck deliveries to replace current chlorine supplies. For example at the Jensen plant, approximately 70 five-thousand gallon tanker truck deliveries of 5.25 percent sodium hypochlorite solution, roughly enough to disinfect one week's worth of water supplies at the plant during peak usage, would be required to replace one 90-ton liquefied chlorine gas railcar delivery (see attached chart).

In addition, the use of commercial hypochlorite by Metropolitan may not reduce the number of railcar deliveries of chlorine gas to the Southern California region because chlorine gas is required for the production of hypochlorite solutions. Since hypochlorite solutions readily decay, especially at elevated summertime temperatures, these solutions are generally produced locally to minimize shipping time and distance. As a result, chlorine railcar deliveries to commercial production and conversion facilities in Southern California would continue. Finally, there are no assurances that secure chlorine gas containment at these local commercial manufacturing sites would be provided to the same degree as those at Metropolitan's treatment plants. These factors led us to determine that such a conversion would do little to actually increase the regional security of treatment chemicals.

Cost Considerations

While not the main factor behind Metropolitan's choice of chlorine gas, it should be noted that our 2006 study found that the costs for all alternatives would be greater than the costs incurred by Metropolitan's current chlorine security program. Metropolitan's

capital cost for its current program to provide upgraded chlorine containment structures at its five water treatment plants and its chemical unloading facility is estimated at approximately \$120 million. In comparison, the initial capital cost to generate dilute hypochlorite at each treatment plant was estimated to be 44 percent higher in the 2006 study. Annual operating costs for all alternatives were found to be at least twice as expensive as the \$3 million per year expenditure. Again, these increased cost projections were not our primary concern as we evaluated treatment alternatives, but in light of the uncertainty about the viability and consequences of alternative treatments, and considering the robust security enhancements we have already put in place, Metropolitan is confident with the decision to continue using chlorine gas as a primary disinfectant.

Current Legislative Proposals

Let me first clearly state that our organization and other large water systems are committed to securing chlorine and other necessary chemical supplies to the highest standards. In light of our experience with protecting chlorine supplies and evaluating alternate treatment technologies, Metropolitan and other AMWA member utilities welcome the opportunity to offer constructive feedback on the chemical security legislation now making its way through the House. H.R. 5533 (the “Chemical Facilities Act”), as proposed by Rep. Wynn, would not negatively impact the operations of drinking water facilities. However, H.R. 5577 (the “Chemical Facility Anti-Terrorism Act”) as approved by the House Homeland Security Committee in March could significantly undermine the ability of Metropolitan and other drinking water utilities around the nation to operate on the basis of expertise and knowledge of our region’s source water characteristics. Moreover, the overall public health relies on our undisputed

ability to choose the optimal drinking water disinfection method. As the Energy and Commerce Committee begins its consideration of these proposals, it is our hope that these adverse impacts on drinking water supply activities will be addressed.

As the Committee is aware, the Public Health Protection and Bioterrorism Preparedness and Response Act of 2002 required all drinking water utilities serving at least 3,300 customers to prepare vulnerability assessments and emergency response plans to identify and address weaknesses in their security standards, under the guidance of EPA. In light of this requirement and subsequent voluntary measures taken by drinking water utilities (such as security upgrades, increased training, and chemical reduction and substitution when feasible), in 2006 Congress exempted drinking water systems from duplicative regulation through the Department of Homeland Security's Chemical Facility Anti-Terrorism Standards, or "CFATS." H.R. 5533 in its current form would avoid duplicative and potentially contradictory federal regulation over drinking water facilities by continuing this exemption.

There has been substantial discussion about proposals to reverse the exemption. It is AMWA's position, reflected in H.R. 5533, that existing federal laws pertaining to the security of drinking water systems are sufficient. We are open to discussing proposals that would require the approval of vulnerability assessments and security plans based on a defined risk-based standard, a standard that does not interfere with the abilities of local utilities to properly disinfect their source water supplies.

In our review of H.R. 5577, we have identified several concerns about the authority, granted in Section 2110 ("Methods to Reduce the Consequences of a Terrorist Attack"), allowing DHS to force community water systems across the country to replace

their use of critical water disinfectant chemicals with alternate substances. The blanket promotion of these alternates, commonly referred to as “inherently safer technologies,” or “IST,” does not recognize the complex process that many water utilities, including Metropolitan, undertook to evaluate potential treatment alternatives in the overall effort to choose the best treatment method to protect public health while delivering clean and safe drinking water to millions of customers.

As I stated earlier, Metropolitan’s own evaluation of alternative treatments to gaseous chlorine found, among other obstacles, that it would take approximately 70 five-thousand gallon tanker truck deliveries of sodium hypochlorite solution to treat as much drinking water as is currently disinfected by one railcar delivery of chlorine gas. We do not believe that trucking 70 deliveries of sodium hypochlorite through the streets of Los Angeles on a weekly basis is “inherently safer” than Metropolitan’s current security-intensive procedures that receive one rail shipment of chlorine over that same period of time. H.R. 5577, as currently written, would allow federal officials to make these critical decisions on behalf of local water utility professionals. The consequences of this proposal could impose impractical changes on water systems that would not only bring new security challenges, but also public health risks and cost escalations to be borne by local ratepayers. This is why AMWA firmly believes that DHS, EPA, or any other federal agency must not be given the broad power override local drinking water experts.

We are also concerned about sections of H.R. 5577 that would allow DHS to declare a drinking water treatment plant to be a national security threat, and then order the facility to cease operations. We do not believe that the Department is the best authority to make a decision to shut down a community’s local drinking water plant. If a

local water utility does shut down, for example, basic fire protection and sanitation services are immediately suspended, thereby leading to a significantly increased public health risk or necessary evacuation of the community. AMWA recommends that this federal shutdown authority over local water facilities be completely removed from the legislation.

The Committee must also strongly protect the critical security information contained within vulnerability assessments and response plans completed by drinking water systems. The Public Health Security and Bioterrorism Preparedness and Response Act of 2002 prohibited the disclosure of the contents of vulnerability assessments and emergency response plans under the Freedom of Information Act. The law also strictly limited access to the assessments to specific individuals identified by EPA, even while allowing the appropriate sharing of information with appropriate local officials. H.R. 5533 in its current form would sustain these protections for information submitted by water systems, but H.R. 5577 may broaden the scope of individuals who may access information within the documents. In crafting new legislation, the information protection provisions formulated by the Committee should mirror those of the 2002 law as much as possible.

AMWA also urges the Committee to carefully evaluate claims that all drinking water utilities can easily change from gaseous chlorine to other treatment technologies with little or no consequences. When viewed in the context of local experience and circumstances, it becomes apparent that broad “IST” mandates are not workable or wise for many of the country’s drinking water utilities.

In particular, some groups have claimed that water treatment chemicals should be

held only in small batches, and that “just-in-time” technology could be used to minimize the storage time of these necessary chemicals. Unfortunately, keeping only small batches of critical water treatment chemicals on hand is not an option for drinking water utilities that must protect against any unforeseen supply chain disruptions that could impact the planned delivery schedules of necessary chemical components. For example, Metropolitan generally keeps 30 days worth of chlorine on hand so that an unexpected supply chain interruption (such as a large earthquake) will not compromise drinking water service in Southern California. Therefore, it is simply not feasible to keep only small amounts of these substances on hand and trust the health of millions of our customers to the belief that delivery schedules will always operate as expected.

Practical considerations related to the need to keep several weeks worth of treatment chemicals on hand also demonstrate the problems with “inherently safer technology” mandates. To reiterate, a single 90-ton railcar of liquefied chlorine gas is sufficient to disinfect about one week’s worth of drinking water at Metropolitan’s largest treatment plant, so securing four of these railcars within our facility ensures that we have enough on hand to disinfect drinking water for 30 days in the event of a delivery disruption. However, if Metropolitan were forced to transition to 5.25 percent sodium hypochlorite, we would need to keep the equivalent of more than 280 five-thousand gallon tanker trucks of the substance at our plant to maintain this same 30 day emergency supply during peak usage. It is much easier to protect four railcars than 280 tanker trucks, not to mention the fact that this sodium hypochlorite would have to be continuously rotated to ensure that the solution does not break down during periods of high temperatures in Southern California.

Groups advocating in support of “IST” mandates also frequently present the issue as simply a matter of cost, especially when targeting utilities that have determined that gaseous chlorine remains their best treatment option. There are important feasibility concerns beyond cost, such as increased truck transport of chemicals, absence of space at treatment facilities on which to store necessary quantities of alternate substances, saline discharges in excess of existing limits into regional basins, supply chain concerns, and the fate of byproducts such as hydrogen gas, bromate, chlorate, and perchlorate all exceeded cost as critical factors influencing Metropolitan’s decision. These same feasibility and public health issues have been considered by many other water utilities around the country when choosing the most effective disinfection method, making clear that cost is not the primary motivation.

Practical and Effective Water System Security

AMWA and its member utilities are committed to ensuring the protection of critical chemical inventories located at water treatment plants. One logical approach was advocated by the Long Beach Water Department (an AMWA member and a Metropolitan member agency) in testimony before the Homeland Security Committee in February.

Long Beach is working to end its own use of gaseous chlorine, but the utility cautioned against the imposition of any broad federal “IST” mandate on water utilities.

Specifically, their testimony stated:

[N]umerous local considerations and other critical site specific factors must be considered, on a strict case-by-case basis, to determine feasibility of integrating any of these alternative technologies [into the operations of drinking water systems.] ... Any consideration of alternative technologies must include assurances that maintain reliability of water systems, as well as the flexibility needed to enable water treatment operators to adhere to strict Federal and State water quality standards.

As a means to promote the adoption of alternative treatments when feasible, while still maintaining local choice of water treatment method, Long Beach suggested that the legislation include a federal grant program “to encourage the consideration and implementation of alternative disinfection treatment methods [by water systems], on a voluntary basis.” This is an approach endorsed by AMWA.

AMWA fully supports water utilities, such as Long Beach, that have conducted a careful evaluation and assessment and have chosen to replace their use of gaseous chlorine with an alternate water treatment method. Metropolitan, too, has reduced its number of facilities that hold chlorine gas from 17 to 6. This proactive approach to security demonstrates that local utility managers are serious about identifying and implementing measures that will best protect public health and facility security in a cost-effective and feasible manner. Therefore, to help utilities enact security enhancements that best fit their needs, any chemical facility security legislation passed by this Committee should include grant funds that would assist utilities in financing critical security upgrades, up to and including the voluntary adoption of alternate water treatment methods. Such a plan would help local water utility professionals convert treatment methods in circumstances where doing so is found to be the best option.

Similarly, the association believes that Congress should also respect the expertise of utilities, such as Metropolitan, that have considered the alternatives and opted to continue disinfecting water supplies with chlorine gas. Just because some utilities in the U.S. have been able to feasibly adopt an alternate water treatment method does not mean that these same alternatives are workable for each and every utility in the country. Factors that must be considered, on a case-by-case basis, include not only cost, but also

climate, location, ambient water quality, available technology, and new security consequences. These considerations must be analyzed at the local level, as Metropolitan has done, with the benefit of the years of expertise held by local water utility managers.

It is our understanding that all large drinking water utilities across the country have complied with the 2002 Bioterrorism Act's mandate to complete facility vulnerability assessments. However, any federal guidelines relating to the future updating and reporting of these plans must ensure that the ultimate choice of water treatment method remains with the local utility, and the protection of the information within the vulnerability assessments is guaranteed. AMWA is available to work with the Committee to help craft these requirements effectively.

I thank the Committee for holding this important hearing today. I would be happy to respond to any questions you may have.

Drinking Water Treatment Chlorine Equivalents

One Week's Chlorine Needs for a Large Treatment Plant

Current Practice: Chlorine Gas



One 90-ton railcar

Alternatives presented for one week's chlorine supply for a large water treatment plant operating at 615 million gallons per day under typical conditions.

Alternative: Delivered Bleach (5.25%)



Seventy 5,000 gallon trailers

Alternative: On-Site Generated Bleach



Sixteen 20-ton salt trailers

2.7 million gal. softened water



2.4 megawatts electricity



24,000 gallons diesel fuel