

REPORT OF THE DISTRICT OF COLUMBIA MAYOR'S SPRING VALLEY SCIENTIFIC ADVISORY PANEL

INTRODUCTION

Under the authority of the Mayor's Order 2001-32 (March 1, 2001), the Spring Valley Scientific Advisory Panel (Panel) held its third meeting on May 29, 2002 in Washington, DC. The meeting's agenda is attached.

The purpose of the meeting was to update the Panel of the current status of the remediation work being conducted and planned for by the U.S. Army Corps of Engineers (USACE); and the District of Columbia Department of Health's (Department) strategy for continued characterization of the risk of potential adverse health effects in Spring Valley, including a presentation of the results of the most recent Exposure Investigation conducted by the Agency for Toxic Substances and Disease Registry (ATSDR).

The previous two panel meetings resulted in requests for additional information from the involved agencies for clarification of the issues presented, and further investigation of potential exposure to contaminants in Spring Valley. The Panel has recommended that attention be given to risk communication including activities designed to enhance the Spring Valley residents' knowledge of process and procedures for assessing potential health impacts of exposure to chemicals released in the environment. In summary, the agencies have made substantial progress in complying with the Panel's recommendations. The documentation for each meeting is on record and available for public review in the Office of the Executive Director of the Mayor's Spring Valley Scientific Advisory Panel located at 51 N Street, NE, 3rd floor, Washington, DC 20002.

PANEL COMMENTS AND RECOMMENDATIONS

The Panel commends each agency for its efforts to address some of the scientific and health-related questions raised by the arsenic contamination in Spring Valley. The Panel has reviewed the materials provided by the DC Department of Health, U.S. Army Corps of Engineers, Agency for Toxic Substances and Disease Registry and the U.S. Environmental Protection Agency, and heard the following presentations.

Status Report of Department of Health Activities

The primary purpose of the Department of Health's (Department) presentation was to update the Panel of the events and activities performed to address the resident's concerns regarding exposure to arsenic and other contaminants in Spring Valley neighborhoods. The Department, represented by Lynette Stokes, PhD, MPH, Chief, Bureau of Hazardous Material and Toxic Substances, reported that it hosted and participated in several community meetings to enhance the resident's knowledge of arsenic and the risks associated with exposure to the contaminant. The Department

distributed a newsletter to keep Spring Valley residents informed during the soil sampling being conducted by the U.S. Army Corps of Engineers. The U.S. Army Corps of Engineers also publishes a newsletter for the residents in Spring Valley. The Department also maintained a website as another source of information.

Dr. Stokes also discussed anecdotal information concerning symptoms of diseases in the community that some residents suspect are related to the environmental contaminants in the area. Following the review of this information, Dr. Stokes requested that the Panel advise the Department on how it should respond to concerned Spring Valley community members.

Update on the Soil Sampling and Overview of the Remedial Work

Major Michael Peloquin, Deputy District Engineer of the U.S. Army Corps of Engineers (USACE) updated the Panel on the soil sampling plan and the results of the ongoing soil sampling program.

The USACE reported that it had completed an initial soil screening of 95% of the residential properties (of 1158 total properties) and 74% of non-residential lots (of 325 total lots), which included taking 525 subsurface borings (generally 6-10 feet deep) and testing for arsenic, and in some cases testing for other contaminants. Of the properties sampled, eight samples were greater than 20 ppm (7 are in the top 12"), and 12% (approximately 144 properties) required a follow-up grid sampling. The grid sampling results included 43 properties with one grid \geq 43 ppm and 30 properties with one grid \geq 100 ppm. The highest single grid was 613 mg/kg.

Based on the sampling results, the USACE planned a phased approach to removing the arsenic contaminated soil. A time critical removal of soil on seven properties has been scheduled to begin in June 2002. The USACE is moving forward with plans for arsenic removal and subsequent removal activities will be prioritized based on the arsenic levels in the soil, use of property, input from the community and from other agency partners. Removal activities will likely continue well into the future.

Agency for Toxic Substances and Disease Registry's Exposure Investigation

The Agency for Toxic Substances and Disease Registry (ATSDR) conducted an exposure investigation in March 2002, in cooperation with the District of Columbia Department of Health. The exposure investigation included an analysis of urine and hair samples of people whose homes had the highest arsenic levels in composite soil samples taken from their yard. In this exposure investigation, 32 individuals (23 adults and 9 children) and 13 homes were evaluated. Robert Johnson, MD, Medical Officer of the Agency for Toxic Substances and Disease Registry presented the following results.

Individuals had their urine tested for total arsenic (which could come from all sources—food, water, air, soil and dust) and for inorganic arsenic (which could come from contaminated soil and dust). ATSDR measured arsenic in urine in parts per billion

(ppb). All persons tested had total urinary arsenic of less than 100 ppb, except 1 individual who had a level of 210 ppb. All of the individuals tested had no detectable inorganic arsenic except 4 individuals with levels ranging from 10 ppb to 15 ppb. Levels below 20 ppb of inorganic usually indicate no significant exposure. In summary, the urine arsenic levels show very low levels of exposure.

Hair arsenic testing is not as accurate as urine testing, but it gives some indication of the exposure during the past months or years (depending on the length of the hair). ATSDR measured arsenic in hair in parts per million (ppm). All of the people tested had hair arsenic levels between 0 ppm and 0.73 ppm. The average was 0.1 ppm. Levels below 1 ppm usually indicate no significant exposure. In summary, the hair arsenic levels also show that there are low levels of exposure.

In addition to the biomonitoring, ATSDR tested the household dust in the 13 homes. Levels of arsenic ranged from 0 ppm to 63 ppm. The average was 9.9 ppm of arsenic in the dust. It is difficult to interpret the significance of household dust levels. However, it is apparent from the hair and urine tests that these levels are not causing elevated arsenic levels, or any increased health risks, to individuals in these homes.

ATSDR has committed to continue its involvement with the activities in Spring Valley. It is considering repeating some testing during the summer months when people are working in their yards and gardens, and exposure to arsenic is increased. Another key time for retesting might be during soil clean-up activities, which are also scheduled to occur this summer.

Remediation Levels in Spring Valley

Dr. Paul Kostecki, a specialist in soil science and a member of the Spring Valley Scientific Advisory Panel, described and interpreted the scientific data that supported the remediation levels in Spring Valley. Dr. Kostecki reported that the recommended remediation levels were based on credible scientific data. He also stated that there appeared to be regulatory acceptability of the characterization of contamination among the agency partners, and that there was an agreement of the proposed remediation levels. However, Dr. Kostecki highlighted that there remained concerns in the community regarding the balancing of quickly removing the soil, while limiting the risks and disruption to the community.

RECOMMENDATIONS

Based on the presentations cited in the preceding paragraphs, the panel's discussion, its knowledge and experience, and desire for a comprehensive database on which to base conclusions, the following recommendations are made:

Recommendation One

The Panel recommends that the District of Columbia Department of Health (the Department) establish a surveillance system to characterize diseases (arsenic-related disorders) by time, place and person. A primary objective should be to obtain a rapid “suspected case” count. The target population is persons who live in the Spring Valley neighborhoods of Northwest Washington D.C., and the emphasis is on “arsenic-related” diseases because the soil analysis conducted thus far indicates that arsenic is the primary contaminant of concern.

The Panel is aware that Spring Valley residents may be concerned about environmental exposures or environmentally induced illness. Persons with symptoms of illness will likely present first to physicians’ offices, clinics or hospital’s emergency rooms, where the characteristics of the illness may be defined, not the symptoms but also the functional and biochemical alterations that characterize the illness.

The Panel urges the Department to give thorough consideration to the case definition – which is fundamental to any surveillance system – since it is the formal answer to the question of what manifestations of a disease or condition are under surveillance. The case definition should be sufficiently inclusive (sensitive) to identify persons who require the Department’s attention but sufficiently exclusive (specific) to avoid unnecessary diversion of that attention. The Panel is aware that there is no ideal case definition for any particular disease or condition.

Recognizing that “reporters” are critical to an effective surveillance system, the Panel recommends that the Department clearly identify persons responsible for reporting “cases” such as health care providers that serve the Spring Valley neighborhoods or persons at specific institutions (clinics, hospitals).

In addition to communicating case reports, the health care professional (“the reporter”) may be responsible for providing laboratory and related data of the case. The Panel is aware that Spring Valley residents may seek care from clinicians and other health care providers outside the Spring Valley neighborhoods. The Department will want to consider this issue in planning the surveillance system. Here, the Department may wish to facilitate the establishment of a network of health care providers to report “cases” to the surveillance system.

The Panel further recommends that the Department examine geographical or spatial differences in incidence. Plotting the cases on a District of Columbia/Spring Valley map is one approach. Since the Department already has “hazard surveillance data” – the occurrence of and distribution of environmental contaminants in the soil – developed by the U.S. Army Corps of Engineers soil testing program, efforts should be made to determine relationships between that data set – disease surveillance data and hazard surveillance data. To effectively accomplish these tasks, the Department will want to draw on the expertise of environmental epidemiologists, specialists in human exposure assessment and specialists in clinical environmental medicine.

Recommendation Two

The Panel recommends that the Department in collaboration with the U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency develop specific plans to ensure that the remediation process does not increase potential and real exposure of Spring Valley residents to environmental contaminants. In other words, the remediation process should not increase individual or residential contamination or otherwise increase the pollutant burden on Spring Valley residents. The Panel is well aware that there may be transient increases in pollution during removal or remediation procedures. Effective planning by the agencies should keep such increases to a minimum.

In this connection, written and oral advisories to the residents regarding their “behavior” or activities during the remediation process should be practical and based on the best available scientific knowledge about exposure, risk, and personal risk management procedures. Information for the community (advisories, etc.) should be in a clear and concise format. If supplied electronically, it should be user-friendly and readily interpretable.

As the emphasized in its earlier reports, the bioavailability of the contaminant influences the likelihood that a material will enter the circulatory system (blood) once contact is established. The ease with which the contaminant can be extracted from the soil and gain access to the blood is termed bioavailability, which depends on the unique properties of each chemical and varies with its chemical and physical state, and the properties of the soil, including its inorganic and water content. Much of the arsenic occurring as contaminants in soils are in a relatively insoluble form with low bioavailability.

In further considerations of risk, the Panel notes that some foods, especially those of marine origin, have high concentrations of arsenic, and consumption results in a surge of concentration in the urine. Depending on the nature and amount of arsenic species in the food, recent consumption of certain foods might not represent a toxicological concern.

Recommendation Three

The Panel recommends the adoption of the 20 ppm remediation level by the District of Columbia government as proposed by the U.S. Environmental Protection Agency (EPA). This “target goal” for clean up of the Spring Valley community is based on data assembled by the EPA, and made available for the Panel’s review. The Panel also reviewed other relevant databases. The Panel notes that state governments have promulgated varying soil clean up levels after considering a number of approaches. For example, one approach is to require that a responsible party clean up “to background”. Thus for metals that occur naturally in the soil, there is some average background level, below which clean up would not be feasible. However, there are separate backgrounds for urban versus rural areas, and it is not feasible to expect urban soils to reach rural levels. Another consideration is projected use of the site. It is not necessary to clean up an industrial site to the same level as a residential site. Spring Valley is a residential site.

The remediation level of 20 ppm in Spring Valley is below the organ specific, non-cancer toxicity of 23 ppm for arsenic and is very close to the background concentration that has been determined to be as high as 18 ppm. The Panel believes that the 20 ppm remediation level should not pose a health hazard to the community and should not threaten the natural ecological systems of northwest, Washington, D.C.

Recommendation Four

The Panel recommends that “the agency partners” – District of Columbia Department of Health, the U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency – continue efforts to involve community members to ensure they are aware of and understand the procedures underway to identify, evaluate and effectively manage potential or real environmental health risk in Spring Valley. It bears repeating, that the expectations and desires of members of the Spring Valley neighborhoods are as important to successful cleanups as are regulatory levels of contaminants.

In this regard, the Department should enhance community members understanding of the limitations of protective clothing. Protective clothing and gloves provide barriers between skin and potentially airborne hazardous material but no clothing is truly impervious, few materials are available that provide relatively impermeable barriers for extended periods. Long-sleeve shirts or coveralls may not completely prevent skin contact with toxic dust because small dust particles can sift through openings between threads in woven cloth. Some reduction in exposure can be obtained by limiting the amount of time spent in areas with potential exposure to the contaminant. Showers also facilitate this effort after working (disturbing soil, etc.) in areas.

Recommendation Five

The Panel recommends that the Department, with the assistance of the Agency for Toxic Substances and Disease Registry (ATSDR), pursue “phase two” of the exposure investigation as suggested in the Panel’s second report (January 2002). The Panel is aware of the results of earlier biomonitoring, but recommends additional data on exposure (or lack of) to ensure there is a comprehensive (e.g., statistical power) database on which to draw conclusions.