

REPORT TO TWENTY-FOURTH LEGISLATURE  
STATE OF HAWAII  
2007

LITIGATION AGAINST  
WASTE MANAGEMENT AND CITY & COUNTY  
&  
ENVIRONMENTAL HEALTH SURVEILLANCE

PURSUANT TO H.C.R. 76, H.D.1, 2006  
REQUESTING THE DEPARTMENT OF HEALTH  
TO REPORT ON THE STATUS OF ITS LITIGATION AGAINST WASTE  
MANAGEMENT OF HAWAII, INC.  
AND CITY AND COUNTY OF HONOLULU  
AND  
REPORT ON HOW THE DEPARTMENT OF HEALTH CONDUCTS  
HEALTH SURVEILLANCES RELATED TO ENVIRONMENTAL FACTORS,  
SUCH AS LANDFILLS AND INFECTIOUS DISEASE,  
AND  
HOW THE DIVISIONS OF THE DEPARTMENT OF HEALTH WORK  
TOGETHER TO SHARE INFORMATION AND DETERMINE ANY  
ACTIONS TO BE TAKEN

Prepared By:  
State of Hawaii  
Department of Health  
Solid and Hazardous Waste Branch  
And  
Hazard Evaluation and Emergency Response Office  
December 2006

## Table of Contents

Introduction.....	4
Status Of Waimanalo Gulch Litigation .....	4
Health Surveillance For Environmental Factors.....	5
Summary .....	5
Background .....	5
Assessments of Health Risks From Environmental Pollution .....	6
General Activities .....	6
Health complaints .....	6
Environmental Samples .....	7
Case Studies .....	8
Health Risks Related to Landfills .....	8
Arsenic Assessment Kea’au, Hawaii .....	9
Keaukaha, Hilo, Hawaii .....	9
Village Park .....	9
Pu’uwai Momi Mercury Removal .....	10
VOG Health Assessment Study .....	10
Pesticides and Heavy Metal Poisoning .....	10
Current Environmental Infectious Disease Surveillance .....	11
General Activities .....	11
Disease Surveillance and Investigation of health complaints and illnesses .....	11
General.....	11
Disease Surveillance by Media.....	11
Food borne disease.....	11
Drinking Water Borne Disease .....	12
Surface Water Borne Disease .....	12
Ala Wai Sewage.....	12
Vector Borne Disease .....	12
Disease Surveillance Case Studies.....	12
West Nile Virus Surveillance.....	12
Dengue Fever .....	13
DIB investigations .....	14
Funding .....	15
Current DOH Efforts to Build Infrastructure for a Tracking Program .....	15
Federal efforts .....	15
DOH One Stop Program .....	16
Exchange Network.....	16
Laboratory Information Management Systems (LIMS) .....	16
Hawaii Health Data Warehouse.....	17
Sources of Tracking Data.....	17
<b>Table 1</b> .....	17
Potential Sources of Data to Track Health Effects from Environmental Factors .....	17
Data Sources .....	17
Web Link .....	17

Western Tracking and Biomonitoring Collaborative.....	18
Pesticides and Heavy Metal Poisoning.....	18
Inter-divisional Information Sharing at DOH.....	18
Conclusion and Recommendations.....	19
References.....	20
Attachment.....	21

## Introduction

This report meets House Concurrent Resolution (HCR) No. 76, H.D. 1, which requests the Department of Health (DOH):

1. To prepare an interim and final report on the status of the litigation between the Department of Health, State of Hawaii vs. Waste Management of Hawaii, Inc. and City and County of Honolulu (Docket No. 05-SHW-SWS-004) (the “litigation” or “enforcement case”);
2. To report on how it conducts health surveillances related to environmental factors, such as landfills and infectious disease; and
3. To report on how the divisions of the Department of Health work together to share information on environmental matters and determine any actions to be taken.

## Status Of Waimanalo Gulch Litigation

The litigation is ongoing and not yet resolved. On January 31, 2006, the DOH issued a Notice and Finding of Violation and Order against Waste Management of Hawaii, Inc. (WMH) and the City and County of Honolulu (City) for alleged violations of solid waste management laws, regulations, and permit conditions at the Waimanalo Gulch Sanitary Landfill (WGSL). WMH is the operator, and City is the owner of the WGSL. In general, the DOH alleged the following violations:

1. Exceedance of permitted grades
2. Failure to submit annual operating reports in a timely manner
3. Failure to place daily cover on the MSW landfill
4. Failure to place intermediate cover material on the ash monofill
5. Exceedance of leachate head on the liner in the ash monofill
6. Exceedance of leachate head on the liner in MSW Cell E-1 sump
7. Failure to measure leachate levels and to maintain records on leachate levels in Cell 4B sump
8. Failure to measure leachate levels and maintain records on leachate levels in the ash monofill sump
9. Failure to notify DOH of noncompliance on equipment blockage in MSW Cell 4B leachate lateral line and inability to measure leachate levels
10. Failure to notify DOH of noncompliance in a timely manner on the exceedances of permit grades and submission of the AORs
11. Unauthorized storage of material on the ash monofill
12. Failure to manage and ban the acceptance of special waste
13. Failure to maintain records and record location of asbestos disposal at the landfill
14. Failure to cover a dead animal
15. Failure to submit annual surface water management plans
16. Failure to control the generation of dust from vehicular traffic
17. Failure to minimize free litter generation in the landfill
18. Failure to monitor explosive gases and maintain monitoring records

On February 13, 2006, WMH and the City requested a contested case hearing, and the parties exchanged numerous documents. The hearing was originally scheduled to begin October 2, 2006. However, in order to allow for continuing settlement negotiations, the hearing is currently scheduled for January 2, 2007.

On September 29, 2006, the DOH Hearings Officer and all parties to the case received a motion from Senator Colleen Hanabusa to intervene as a party. A hearing was held on this matter on December 4, 2006.

## **Health Surveillance For Environmental Factors**

### **Summary**

DOH handles health complaints due to potential exposure to hazardous chemicals, reviews environmental sampling data, and receives reports that physicians and laboratories are required to make about suspected pesticide or heavy metal poisoning. This report focuses on direct health surveillance and does not attempt to describe all the environmental monitoring that DOH does, e.g. water, air, and land sampling.

The link between environmental pollution risk factors, such as heavy metals, pesticides, and other hazardous substances, and noninfectious disease is still largely unknown. The federal government seeks to build a Nationwide Environmental Public Health Tracking Program (EPHT)(referred to as Tracking Program), to link information on environmentally related diseases, human exposures and environmental hazards. DOH is working on data integration projects.

DOH also conducts and participates in surveillance on environmental infectious diseases, such as West Nile Virus, murine typhus, food and drinking water borne illnesses, and illness from contaminated recreational waters, such as Leptospirosis.

Both automated information system and human networks need improvements and the resources to do it.

### **Background**

The link between environmental pollution risk factors and noninfectious disease is still largely unknown (CDC, 2006). Most of the public health surveillance currently in place in the United States focuses on infectious disease, and DOH's environmental surveillance in that area is described below. In September 2000, the Pew Environmental Health Commission released a report on the state of environmental public health in the U.S. The Commission concluded that there is an environmental health gap in the government's ability to track exposure to pollutants and the distribution of disease and its relationship to the environment. They found that the tracking programs that exist at the state and local levels were fragmented and ineffective because there were no

minimum standards or requirements for environmental health tracking. Based on their recommendations, efforts are underway at the federal level to build a Nationwide Environmental Public Health Tracking Program (EPHT)(referred to as Tracking Program), to link information on environmentally related diseases, human exposures and environmental hazards.

The Hawaii Department of Health (DOH) currently has limited ability to track disease related to environmental factors. Efforts are underway within the DOH to build the infrastructure necessary to manage and disseminate the large amounts of data necessary to create a Hawaii Tracking Program. This part of the report is divided into four sections:

- 1) Current activities within the DOH's Environmental Health Administration (EHA) related to assessing health risk from environmental pollution exposures;
- 2) DOH's surveillance activities for certain environmental infectious diseases;
- 3) Current DOH efforts to build the infrastructure necessary for a Tracking Network and Program; and
- 4) Interdivisional information sharing at DOH.

## **Assessments of Health Risks From Environmental Pollution**

### **General Activities**

DOH handles health complaints, reviews environmental pollution sampling data, and receives reports about suspected pesticide or heavy metal poisoning.

### **Health complaints**

One of the major responsibilities of the DOH's Hazard Evaluation and Emergency Response (HEER) Office is responding to hazardous substances releases or risk of releases. Part of the response is handling the health complaints due to potential exposure to hazardous chemicals. The Hazard Evaluation (HE) Section of the HEER Office evaluates approximately 150 health complaints every year from citizens concerned that exposure to chemicals in the environment have affected their health. Many of the complaints are referred from other environmental branches and divisions within the DOH. Subsequently, the follow up investigations involve collaboration and data sharing with the office referring the call. To keep track of the inquiries and follow up investigations, the information is entered into an Access database entitled "Hazard Evaluation Inquiry Reports." Monthly reports are generated for internal use.

The HEER office has written procedures on how to conduct a health hazard evaluation. When the initial call comes into the HE Section, an evaluation is conducted over the phone to assess the threat to health. Both human health and ecological threats are considered. The following information is obtained:

- The full name, address and telephone number of the person calling
- The location of the actual/potential release also called the “site”.
- A description of how the caller is or may be affected by the actual/potential release.
- Other information that is useful includes: the name of the substance(s) involved; a description of the substance(s) involved; how the substance is or may be released; events leading to the release; and other state or local agencies already contacted and what they did.
- Information on whether the caller has seen a physician and a request for permission to contact the physician.

If the name of the substance or material is known, an evaluation of the harm that substance might cause to people is evaluated. To evaluate whether the reported health complaints could be linked to exposure to hazardous substances at a site, information on possible sources of exposure is obtained from the caller. If upon listening to the caller’s complaint and taking a history of the caller’s presenting illness there is a possibility of an environmental exposure, the case is referred to an On Scene Coordinator if there is a potential for an immediate health threat due to a release or to the appropriate local, state or federal agency if a potential long term environmental threat exists. The HE staff evaluates the environmental sampling data provided by the investigating agency to assess whether the contaminant levels could pose a health risk. If a release has occurred, steps can be done to eliminate the exposure source and prevent exposure to any other individuals involved. A flow chart is attached outlining the process for evaluating health complaints from the public.

## **Environmental Samples**

The DOH pollution control branches collect numerous environmental samples for air, water, and land pollution, and the State Laboratories Division analyzes most of those samples, while contract laboratories analyze other DOH samples. The DOH also receives numerous reports from contractors and consultants who work with the department or for regulated parties, and from academics and other government agencies. The branches notify the HEER Office and Disease Investigation Branch or other DOH branches of notable results.

Reviewing environmental sampling data generated as part of an environmental investigation is another way that the Hazard Evaluation (HE) staff assesses the health impact of environmental exposures, without first being notified by the public. The HE section is a centralized group providing risk assessment services to the DOH as well as other state agencies. The HE staff routinely provides risk assessment support to the Site Discovery, Assessment and Remediation (SDAR) Section of the HEER Office which is responsible for assessing the near and long-term threat of sites contaminated with hazardous substances. Environmental sampling data are reviewed by toxicologists and risk assessors in the HE section to assess the health risk from exposure to

contaminated soil, groundwater, air or food. In addition to working with SDAR, environmental sampling data from numerous programs within DOH are evaluated by HE toxicologists and risk assessors. HE staff assists the Solid and Hazardous Waste Branch, Clean Air Branch, Clean Water Branch, Safe Drinking Water Branch, Food and Drug Branch, and the Women and Infant, and Children Program with risk assessment support.

### **Case Studies**

Several cases are provided to illustrate examples of investigating environmental contamination and health effects.

#### Health Risks Related to Landfills

The HEER Office is integrally involved in evaluating the health risks from exposure to contaminants at landfills. With respect to Waimanalo Gulch Sanitary Landfill, HE toxicologists and risk assessors have assisted the Solid and Hazardous Waste Branch in reviewing environmental data collected at the landfill to assess whether an environmental hazard exists. A study of health risk posed by dust from the landfill to workers, visitors and nearby residents was submitted by the city's consultants in 1999. Testing of airborne dust levels in and around the landfill was included in the study. The study concluded that the health risk to workers and nearby residents is insignificant. DOH reviewed the data and believes that the worst-case estimates of dust levels and associated health risks are adequately conservative for current operating practices at the landfill. In 2005, DOH reviewed potential human health and ecological concerns posed by landfill leachate and concluded that the health risk to workers and offsite residents were insignificant. The aquifer under the landfill is not a source of potable drinking water and is already brackish. Possible impacts to groundwater under the landfill and subsequent effects on shoreline ecological habitats were also not considered to be significant. This issue is being further evaluated, however, under cooperative studies being carried out by the City and DOH. Since no environmental hazard was found, further efforts to assess the health of surrounding residents are not currently planned.

Another example of assessing the health risk from exposure to contaminants at landfills is PVT landfill in Nanakuli. Because residents live adjacent to the landfill, DOH was concerned that fugitive dust containing heavy metals or polychlorinated biphenyls (PCBs) could pose a long-term health impact. DOH used a private contractor, AMEC Earth and Environment to conduct sampling and prepare a human health risk assessment of fugitive dust and surface soils at the PVT landfill. Respirable dust concentrations were measured during disposal activities at PVT landfill. Respirable dust concentrations within the community were estimated using EPA approved air dispersion models. Staff from the Clean Air Branch and the Solid and Hazardous Waste Branch assisted the HEER office in the study design and review of the results. The results of the risk assessment indicated that disposal of soil containing heavy metals and PCBs does not pose a risk to residents living downwind of the landfill. Based on the environmental data, no health surveillance is currently planned.



### Arsenic Assessment Kea'au, Hawaii

This case illustrates how the discovery of an environmental hazard triggered further investigation of the health impact to residents potentially exposed to elevated levels of arsenic. High levels of arsenic were discovered on a 5-acre site in Kea'au during 2004. Additional soil sampling in a number of areas around the Kea'au town area revealed high soil arsenic levels in other areas around Kea'au. Because of the high levels detected in the soil, DOH contacted the Agency for Toxic Disease Registry (ATSDR) for assistance in evaluating the health impact to residents. DOH and ATSDR conducted an Exposure Investigation (EI) in the Fall of 2005 to assess human exposure to arsenic contamination in two former plantation communities in the Kea'au area. Over a period of 2-3 months, approximately 30 volunteers from the two Camps had their urinary arsenic (total, inorganic and organic) levels measured, three times for each person, to assess whether current arsenic levels in soil could pose a health hazard to community members.

The results of the EI revealed that the majority of the participants had urine arsenic levels that were safely below the reference value in at least one of the three tests, and therefore did not require further follow-up or evaluation. However, several adult participants, who were primarily older, had urine arsenic levels that remained above the reference value for all three tests. Certain foods, such as seafood or seaweed, may have contributed to their result. In fact, the majority of them stated that they ate some type of seafood prior to their urine collection. They will be retested in December 2006 after abstaining from seafood for 5 days prior to testing.

### Keaukaha, Hilo, Hawaii

In 2003, DOH worked with ATSDR to investigate various health complaints including respiratory problems and headaches among residents of Keaukaha, a Hawaiian Homelands neighborhood between Hilo Airport and Hilo Harbor. Some residents were concerned about a possible environmental cause to the health problems. Several potential sources of air pollution are located adjacent to the neighborhood. Community members sent letters to legislators and the Governor requesting an environmental investigation. In response to community concerns, the DOH and its contractor conducted air sampling for numerous air pollutants within the neighborhood. Air samplers were placed within the neighborhood that collected air pollutants for 24 hours per day on 7 consecutive days in 75 locations. The final report entitled "Keaukaha Hawai'ian Homelands Site Ambient Air Study" concluded that the level of air pollutants were far below the levels that would potentially cause health effects. A public meeting was held in the community in March 2005 to present the final report to the community. No further sampling is planned at this time.

### Village Park

This 1999 case shows how registry data can be used to conduct health surveillance in an Oahu community concerned about agricultural pesticides. In that year the HEER Office responded to citizens' concerns that past application of agricultural pesticides may have caused birth defects, learning disabilities, cancer, and other health problems in their community. Soil sampling conducted by the DOH's contractor found that there was not area wide contamination by pesticides in the soil. Additionally, traces of

pesticides in water were below existing state and federal standards. In addition to environmental sampling, data from the Hawaii Tumor Registry (HTR) and Hawaii Birth Defects Program (HBDP), as well as data maintained by the Department of Education helped to determine whether a community had elevated levels of cancer, birth defects, and learning disabilities. DOH requested the University of Hawaii's assistance to evaluate whether the rate of birth defects and cancer were elevated in the Village Park and Royal Kunia communities compared to the whole state. Also, data maintained by the state Department of Education were analyzed to assess whether Kaleiopu'u Elementary School, the local elementary school, had a larger special education enrollment than the Leeward District. Claims of higher levels of health problems in Village Park and nearby communities were not supported by data from the registries. The number of students in special education, the incidence of birth defects and cancer in Village Park and nearby communities were not higher than comparable levels throughout the State of Hawaii.

#### Pu'uwai Momi Mercury Removal

In 2001, mercury contamination was found at Pu'uwai Momi, a state managed housing complex on Oahu. Mercury was scattered around the complex from children playing with mercury from an old water pump flow meter left in an abandoned water pump station. The HEER Office worked with many state and federal agencies to assess the situation. Initially, the residents were evacuated. The investigation found that 71 of 261 housing units were contaminated. To assess the health risks to the residents, DOH's Epidemiology Branch offered biomonitoring, and the urinary results indicated limited exposure to mercury.

#### VOG Health Assessment Study

Since 1999, the HEER Office has received funding from CDC and engaged the University of Hawaii to assess the health effects from exposure to volcanic emissions. To date, no significant association has been found between mild to moderate vog exposure and changes in lung function.

In summary, health surveillance for exposure to hazardous substances is conducted when a community is concerned about unusual occurrences of health effects or when an environmental hazard is discovered.

#### **Pesticides and Heavy Metal Poisoning**

The DOH HEER Office receives reports from physicians and laboratory directors of cases or suspected cases of pesticide or heavy metal poisoning to the DOH. This is described in greater detail below.

## **Current Environmental Infectious Disease Surveillance**

### **General Activities**

DOH handles health complaints, reviews environmental pollution sampling data, and receives reports about suspected infectious disease due to vectors, food, drinking water, recreational waters, or other environmental exposures.

### **Disease Surveillance and Investigation of health complaints and illnesses**

#### General

The Department of Health's Disease Outbreak Control Division, Disease Investigation Branch (DIB) conducts statewide surveillance of infectious diseases of public health concern, including those potentially associated with environmental exposures. State law requires physicians and laboratories to report diseases of public health concern including those that are or may indicate environmental exposure, such as Leptospirosis (fresh water or mud), Dengue (mosquito bite), and murine typhus (infected fleas). For infectious diseases covered by law, positive laboratory results diseases are sent electronically to DOH. The Disease Investigation Branch receives reports, complaints, and investigates suspected and confirmed illnesses.

#### Disease Surveillance by Media

##### Food borne disease

In Fiscal Year 2006, the Disease Investigation Branch investigated 376 food related incidents, 298 of which involved food establishments regulated by the Sanitation Branch or Food and Drug Branch. The Disease Investigation Branch also investigates to the extent possible food borne disease outbreaks originating in places not under direct state jurisdiction, such as norovirus outbreaks originating on cruise ships. (Norovirus is also environmental, as it can be transmitted via contaminated surfaces as well by contaminated food and water.) Diseases and symptoms investigated included reported cases of gastroenteritis (food & unknown causes, bacterial and viral), scombroid and ciguatera intoxications (fish).

Food borne illness statistics are imperfect and incomplete, as many people afflicted with food borne illnesses do not report these conditions to the Department of Health. The common food borne illness symptoms, such as nausea, vomiting, diarrhea, fever, and gastrointestinal pain, can occur from causes other than food related illness. Symptoms are often short lived, and people often tolerate them and self-treat rather than visit a doctor. Even if a person visits a doctor, doctors often fail to report these illnesses.. While people may attribute symptoms to a particular meal, especially if eaten at a restaurant, it is difficult to confirm causation without both food and clinical patient

samples (stools, blood, vomitus) for analysis. There is also great difficulty correlating food safety efforts to food borne illness statistics.

#### Drinking Water Borne Disease

The Disease Investigation Branch investigates cases by disease agent. If a case is suspected of involving a public water system regulated by the DOH, then the Disease Investigation Branch notifies the DOH Safe Drinking Water Branch. The State Laboratory Division analyzes drinking water samples collected by the Safe Drinking Water Branch for microbial contamination.

#### Surface Water Borne Disease

The Disease Investigation Branch investigates cases by disease agent. If a case is suspected of involving state waters regulated by the DOH, then the Disease Investigation Branch notifies the DOH Clean Water Branch. The State Laboratory Division analyzes drinking water samples collected by the Clean Water Branch for microbial contamination. The Clean Water Branch also reviews special water quality sampling analyses of bacterial levels following sewage discharges to marine waters.

#### Ala Wai Sewage

The Disease Outbreak Control Division did an informal review of emergency room visits and wound cultures during the three months after the March 2006 Ala Wai sewage discharge to seek any unusual patterns of illness but did not find any.

#### Vector Borne Disease

The Disease Investigation Branch does share with the Vector Control Branch information on research, surveillance, and control of vector and reservoir species, such as those for West Nile Virus, Leptospirosis, and murine typhus. Both the State Laboratories Division and the Vector Control Branch test selected vectors for disease.

#### Disease Surveillance Case Studies

##### West Nile Virus Surveillance

DOH conducts and participates in multi-branch, multi-agency surveillance for West Nile Virus, which Hawaii does not have yet, and which the various agencies are trying hard to prevent. The extent of internal DOH and multi-agency cooperation is a notable achievement and depends heavily on having a full time coordinator.

The disease is borne by mosquitoes, which the DOH Vector Control Branch traps, and Vector Control and DOH State Laboratories Division (SLD) test. The Vector Control Branch has implemented a computer based information management system, which includes PDA [spell out] use by field workers, on Oahu and is starting the system on the Neighbor Islands.

Birds are the reservoirs for the disease, so DOH funds a 211 hot line for people to report dead birds. 211 asks caller to take the bird to one of 31 drop off sites located on all islands. Division of Land and Natural Resources (DLNR) organizes the pick up and

transport of the birds from the collection sites to the DOH State Laboratories Division for WNV testing. The State is also working to arrange contract dead bird pick-up services. Live birds are also monitored. The U.S. Department of Agriculture (USDA), Wildlife Services Division, under contract from the U.S. Department of Transportation, traps live birds at airports to keep them from hitting planes. The US Geological Survey (USGS) on Oahu, USDA Wildlife biologists on Kauai, and DLNR and DOH on Maui are part of a system to train workers and collect and bring blood from the birds to DOH's SLD for WNV testing.

DOH asks physicians to test any patients with neurological symptoms and who have recently traveled to an area known to have WNV activity. As already mentioned, the DOH Disease Outbreak Control Division monitors human medical reports of a disease with similar symptoms, meningitis. The Department of Agriculture enlists veterinarians to monitor horse nerve illnesses and deaths, because horses are highly susceptible to West Nile Virus. DOH tracks all of these monitoring efforts and now displays surveillance results on its website: <http://www.hawaii.gov/health/family-child-health/contagious-disease/wnv/index.html>.

DOH receives generous funding support from the Hawaii Invasive Species Council, U.S. Centers for Disease Control, and U.S. Fish and Wildlife Service to support its own sizeable commitment of staff and resources. To help manage DOH's many efforts, DOH has a federally funded full time arbovirus (mosquito borne) disease coordinator, who works closely with other agencies, especially the Department of Land and Natural Resource and U.S. Fish and Wildlife Service, which are concerned about West Nile Virus' threat to wipe out several native bird species. Federal funds have also supported an information technology specialist and vector control inspector positions, but the funding is expected to drop drastically. CDC has informed DOH that West Nile funding will be reduced 50% for the period from January 1 through December 31, 2007, therefore the arbovirus disease coordinator and inspector positions will be discontinued at the end of 2006, and the coordinator will transfer to another position that must cover multiple duties.

### Dengue Fever

The 2001 outbreak shows how access to information and data sharing varies among DOH programs. The seriousness of the outbreak required personnel throughout the DOH. Instead of 3 of 17 Divisions and 2 of 34 branches participating as with normal outbreaks, 7 of 17 divisions, 13 of 34 branches participated, 3 of 4 administration offices, 3 of 3 District Health administrators, and 3 of 8 Administrative offices were mobilized. Beyond broader staff participation, higher administrative levels and all communities throughout the state were engaged.

Programs differed greatly in their preparedness and ability to share information. The Disease Outbreak Control Division had a statewide network that allowed DOH to communicate Dengue information to physicians and health centers and to receive case reports quickly. Because DOH did not have an operational electronic reporting system, an *ad hoc* data system had to be built from scratch and data from laboratories and

physicians was entered manually. This situation limited DOH ability to track cases in real time and demanded excessive overtime for DOCD staff. Since 2001, DOCD has completed an electronic reporting system using federal funds for bioterrorism preparedness.

The Vector Control Branch lacked an electronic data system to track the location and status of dengue cases, requests, and responses and used a paper system. The disease surveillance system could not coordinate automatically with vector control efforts, causing redundancy or gaps in vector control coverage. Because there was no place to track environmental data in the infectious disease data system, this information was tracked separately. In some cases, Vector Control sprayed houses after the risk of infection had passed, leading to an inefficient use of limited resources. The Vector Control Branch now has an automated management system as described above.

Public Information. During the outbreak in 2001, the DOH Communications Office (CO) staffed by one person, received help from other DOH entities and a contractor to inform the public. The contractor helped develop a radio and television campaign to educate the public about health risks and preventive actions. The Community Health Division held community meetings and forums statewide. The Immunization Branch coordinated and answered public phone calls about the outbreak, up to about 300 calls per day. A roll over phone system let DOH staff receive calls at various DOH offices. The Development Disabilities Division coordinated a speaker's bureau which answered requests for group presentations. The Health Information System Office set up a website on the outbreak.

The DOH wrote an overall emergency communications plan in 2003, and among other things implemented a three-part public health emergency hotline system. With CDC grant funds, DOH contracted Aloha United Way's 211 phone system, which operates 24 hours, 7-days a week, to be used by DOH for large-scale public health emergencies. DOH also has internal surge hotline capacity with a 5-line reserve, a room and phones to convert for emergency answering services. The DOH also has access to a national CDC public health emergency hotline that can provide state-specific information and referral to callers via a toll-free number during working hours.

### DIB investigations

In Fiscal Year 2006, the Disease Investigation Branch also investigated 622 suspected cases of Leptospirosis, a disease that can be present in streams or mud contaminated by *leptospira* infected animal urine. Other investigations potentially associated with environmental exposures conducted in Fiscal Year 2006 included suspected and confirmed angiostrongyliasis (4), campylobacteriosis (13), dengue fever (36), E. coli O157:H7 infection (30), giardiasis (53), legionellosis (28), malaria (16), Q Fever (2), Rocky Mountain Spotted Fever (1), salmonellosis (70), shigellosis (41), invasive streptococcal group A infections (123), toxoplasmosis (60), murine typhus (113), vibriosis (27), West Nile Fever (23), and yersiniosis (8). Note that DOH does not have sufficient staffing resources to investigate all reported cases of all diseases. Priority is

placed on outbreaks and those diseases that are highly communicable, potentially result in severe illness, and can be prevented. For example, only 13 campylobacter investigations involving 25 ill persons were conducted although there were a total of 580 individual cases reported

### Funding

DOH receives generous funding support from the U.S. Centers for Disease Control (CDC). CDC cooperative agreements fund 80% of DOH infectious disease surveillance personnel (8 of 10 positions) and almost half of infectious disease investigative personnel (6 of 14 positions). Federal funds are renewed on a year-to-year basis. CDC has informed DOH that foodborne disease funding will be reduced 13-25% for the period from January 1 through December 31, 2007.

Since 2001, federal funding has improved the DOH's capacity to respond to terrorism related events. However, the biggest capacity gaps are in programs that lack federal support for technical assistance and infrastructure development. These programs include Vector Control (until FY 2006 & 2006 state Hawaii Invasive Species Council funding), Public Health Nursing, and Communications. To prepare for emergencies, DOH needs updated information systems capable of sharing critical information in real time. The DOH programs with the most advanced data systems are supported by federal funds. Despite their critical role in providing public services, many state funded programs have limited and outdated data systems and often lack the capacity to transfer data to other programs in times of emergency.

## **Current DOH Efforts to Build Infrastructure for a Tracking Program**

As mentioned in the introduction, DOH currently has limited ability to track disease related to environmental pollution factors. Activities are underway within DOH and the Federal government to collect and integrate environmental and health effects datasets necessary to construct a Tracking Network. These efforts are described below:

### **Federal efforts**

The lack of comprehensive standardized data to conduct tracking is not only an issue in Hawaii but is also an issue at the Federal level. In order to build a Tracking Program, a Tracking Network consisting of a core set of nationally consistent health and environmental data must be compiled. Building a Tracking Network will require coordination among many different individuals and organizations in order to make data more accessible and more usable (CDC, 2006). CDC has funded 21 state health departments, three local health departments as well as three schools of public health to conduct activities that will form the basis of a Tracking Network. Hawaii is not one of the states funded at this time, but future efforts could be directed to preparing a proposal for funding.

## **DOH One Stop Program**

Environmental hazards include chemical and physical agents as well as biological toxins than can be found in air, water, soil, food, and other environmental media. Identifying **environmental hazards** is one of the three key components of the Tracking Network. High quality and timely emissions and monitoring data for air, water, soil, food, and other environmental media along with geographic and temporal characteristics are essential elements in building a Tracking Network. Efforts are underway within DOH to integrate and standardize environmental hazard data collected by the various branches in the Environmental Health Administration (EHA). The EHA was awarded a One Stop Grant by the U.S. Environmental Protection Agency to improve its information management practices. The goals of the grant are to reduce the burden of environmental reporting, to integrate information to support environmental management decision-making and to enhance public access to environmental information (Environmental Health Administration Information Management Improvement Project, 2004). Data on environmental hazards collected by the different branches within EHA will be geocoded and standardized as much as possible. After completion of this task, the data will be available for linkage to existing health surveillance systems and exposure information to construct a Hawaii Tracking Network.

## **Exchange Network**

The EPA-States National Environmental Information Exchange Network (Exchange Network) shares selected environmental information automatically. See (<http://www.exchangenetwork.net/> and <http://www.envdatastandards.net/>). Exchange Network states are working on various health related data projects: pesticide use data and medical records (CA), air pollution, asthma, and cardiovascular illness data (OR), fish tissue and birth defects (WA), laboratory and program data exchanges (MI). Utah and Wisconsin have projects to explore or use the Exchange Network to participate in the CDC Environmental Public Health Tracking program.

As of October 2006, the DOH Environmental Health Administration became an operational member of the Exchange Network by using it to send automated facility data to EPA. DOH will share more automated data that way in the future. While there are already many electronic data flows to EPA, the Exchange Network technology, data standards, and work of various state partners of the Exchange Network offer a means to share environmental data with a variety of partners more easily and across program boundaries. For more details on EHA data system improvements, see the department's separate report on On-Line Permitting and Other Environmental Information System Improvements, under Act 160, 2006 Session Laws of Hawaii (Budget Act), section 20.

## **Laboratory Information Management Systems (LIMS)**

DOH is working on selecting and installing a LIMS to electronically communicate laboratory test results with both DOH programs and outside users. The current development work is focusing on handling flu test results in preparation for a pandemic



and is being done with the 2006 emergency appropriation for pandemic preparedness. DOH plans to add environmental tests to the new system later with separate funding.

### Hawaii Health Data Warehouse

**Health effects tracking** is another component of a Tracking Network. Sources of data that have been used to track environmental health conditions include disease registries, vital statistics data, annual health surveys such as behavioral risk factor surveillance system (BRFSS) and hospital discharge data. Through the Healthy Hawaii Initiative, DOH established and administers the Hawaii Health Data Warehouse (HHDW), a web-based single point access of valuable data from multiple sources. One of the goals of the HHDW is to be able to conduct analysis across different datasets, an essential element of a Tracking Network. The current HHDW contains some of the datasets necessary for health surveillance.

### Sources of Tracking Data

The following sources of local data are available, or could potentially be available, to track health effects from environmental factors.

**Table 1**  
**Potential Sources of Data to Track Health Effects from Environmental Factors**

Data Sources	Web Link
Vital Statistics*	<a href="http://www.hawaii.gov/health/vital-records/">http://www.hawaii.gov/health/vital-records/</a>
Hawaii Tumor Registry	<a href="http://www.aloha.net/~htr/">http://www.aloha.net/~htr/</a>
Hawaii Birth Defects Program	<a href="http://www.crch.org/SerHBDP.htm">http://www.crch.org/SerHBDP.htm</a>
BRFSS (Behavioral Risk Factor Surveillance System)*	<a href="http://www.hawaii.gov/health/statistics/brfss/index.html">http://www.hawaii.gov/health/statistics/brfss/index.html</a>
Pesticide and Heavy Metal Database	<a href="http://www.hawaii.gov/health/environmental/hazard/poison.html">http://www.hawaii.gov/health/environmental/hazard/poison.html</a>
Hazard Evaluation Inquiry Reports	<a href="http://www.hawaii.gov/health/environmental/hazard/poison.html">http://www.hawaii.gov/health/environmental/hazard/poison.html</a>
PRAMS (Pregnancy Risk Assessment Monitoring Section)*	<a href="http://www.hawaii.gov/health/family-child-health/mchb/programs/candice.html">http://www.hawaii.gov/health/family-child-health/mchb/programs/candice.html</a>
Hawaii Health Survey	<a href="http://www.hawaii.gov/health/statistics/hhs/index.html">http://www.hawaii.gov/health/statistics/hhs/index.html</a>
Hawaii Poison Hotline	<a href="http://npic.orst.edu/poisondata.htm#hi">http://npic.orst.edu/poisondata.htm#hi</a>
Hospital Discharge Data (HHIC)	<a href="http://www.hhic.org/about.html">http://www.hhic.org/about.html</a>
Emergency Room Visits	
Physician Office Visit Data	
Health Resources and Services Administration/The State and Local Area Integrated Telephone Survey/child health survey	<a href="http://www.mchb.hrsa.gov/thechild/states/hawaii.htm">http://www.mchb.hrsa.gov/thechild/states/hawaii.htm</a>
Tobacco (yrbs,yts,ats)*	<a href="http://www.cdc.gov/HealthyYouth/yrbs/index.htm">http://www.cdc.gov/HealthyYouth/yrbs/index.htm</a>

\*Currently in HHDW

### **Western Tracking and Biomonitoring Collaborative**

The third element of tracking is **exposure tracking**. Progress has been made in this area by Hawaii's recent collaboration with 12 western states in enhancing biomonitoring capabilities. In June 2006, the DOH was invited to be a member of the Western Tracking and Biomonitoring Collaborative (WTBC). The WTBC is a collaboration of 13 western states (Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington and Wyoming) and the Center for Excellence, University of California, Berkeley. These entities all share a common goal -- to improve the public health by reducing and preventing negative health effects from environmental exposures. The purpose of the WTBC is to build capacity at the state public health laboratory level to assess the extent and nature of human exposures to environmental toxicants and to help prevent disease that may result from such exposures. HEER and State Laboratories Division participated in a planning and capacity-building activity that explored the feasibility of collaboration among and integration of existing state programs. Subsequently, the WTBC submitted a grant to CDC for funding to conduct biomonitoring for arsenic and mercury.

### **Pesticides and Heavy Metal Poisoning**

Physicians and laboratory directors are required to report cases or suspected cases of pesticide or heavy metal poisoning to the DOH. The HE section maintains a database that contains lab results of pesticides (such as organophosphates and carbamates) as well as lab results of heavy metals (such as lead, mercury, arsenic, and cadmium). The Pesticides and Heavy Metal Poisoning database is a good source of **exposure data** necessary to link environmental hazards and health outcome. These data are currently used internally to increase the knowledge and understanding of pesticide and heavy metal exposure to individuals and to assess the magnitude of the problem in Hawaii. Plans are underway for FY 2007 to publish a compilation of the results.

In summary, the One Stop Program, further development of the HHDW, Pesticide and Heavy Metal Poisoning Database, collaboration with other western states in assessing exposures to environmental toxicants, and the Exchange Network are five current activities that will assist the State of Hawaii in creating a functioning and sustainable Tracking Network and Program.

### **Inter-divisional Information Sharing at DOH**

As shown above, there are formal health surveillance systems for both environmental pollution and infectious diseases. DOH programs now share information in a variety of ways, with the HEER Office, Disease Investigation Branch, and State Laboratories Division being leaders in special and routine active surveillance. They share information with subject matter programs as the facts warrant.

The DOH also shares information with outside agencies on specific incidents or cases as the need arises.

## **Conclusion and Recommendations**

The DOH now conducts health surveillance for environmental pollution factors only for special public health studies. Assessing the health impact of environmental exposures is a multidisciplinary effort and requires coordination among the different branches and divisions of the EHA and the larger department. Environmental pollution data from divisions and branches of the EHA are shared with and reviewed by the HEER office.

The DOH conducts and participates in environmental infectious disease surveillance for West Nile Virus, food, drinking water, surface waters, and other environmental exposures, and this effort also requires multidisciplinary efforts. The Disease Investigation Branch and State Laboratories Division are important parts of this effort. The West Nile Virus effort is especially notable for its successful internal DOH and interagency coordination.

Improved, automated information management is critical to better surveillance and environmental health improvement. DOH seeks to build systems that can serve or easily be adapted to serve many illnesses and diseases and communicate electronically with many partners.

For example, the development of a Tracking Network and Program will improve our ability to evaluate the relationship between disease and the environment. DOH also realizes that developing the capacity to enhance surveillance of health and environmental trends poses many challenges and will take time. As an initial step, a working group of environmental and health professionals involved in different aspects of health surveillance should convene to discuss preparing a strategy and plan for development of the Tracking Program and Network. The group should explore funding opportunities and sharing of resources with CDC and EPA in order to begin planning and capacity building exercises in the near future. The DOH acknowledges that its primary mission is to protect and to preserve the health and welfare of the citizens of the State of Hawaii and to safeguard the environment that we inhabit. The establishment and maintenance of a Hawaii Tracking Program will be an important tool to assist us in our stewardship mission.

Similarly, the development of an automated Laboratory Information Management System will improve DOH's and the state's disease surveillance.

All improvements in information management systems require adequate funding, both to acquire or improve the system and to operate it afterwards.

As to management, it is important to have staff dedicated to coordinating internal multi-branch and external multi-agency efforts. Again, this takes adequate resources.

Both automated information system and human networks need improvements and the resources to do it.

## References

Center for Disease Control (2006). CDC's National Environmental Public Health Tracking Program. National Network Implementation Plan (NNIP). Version 1.

<http://www.cdc.gov/nceh/tracking>.

National Environmental Information Exchange Network,

<http://www.exchangenetwork.net/>

Environmental Data Standards Council, <http://www.envdatastandards.net/>)

Attachment

