

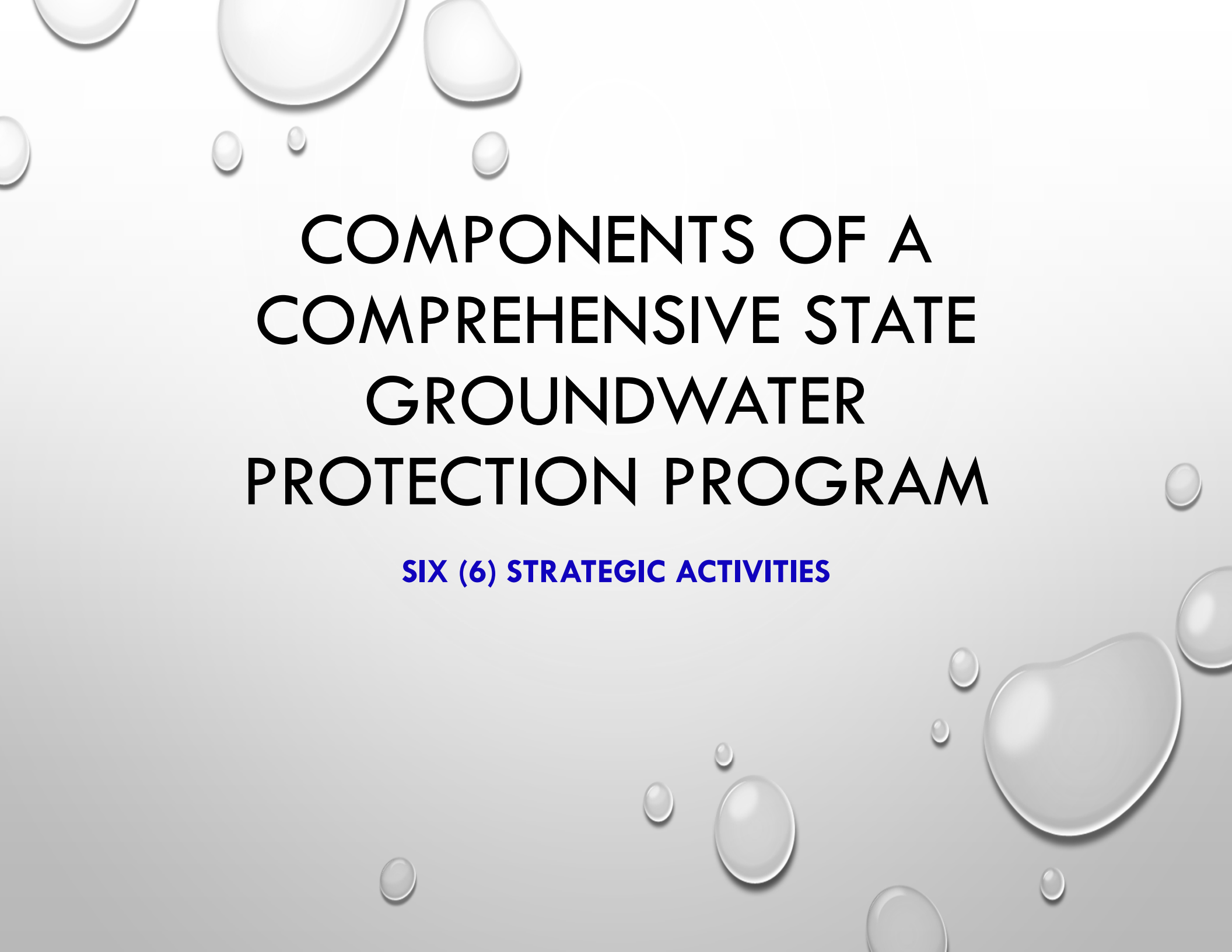
The background is a light blue gradient with several realistic water droplets of various sizes scattered across the top and right sides. The droplets have highlights and shadows, giving them a three-dimensional appearance.

SAFE DRINKING WATER BRANCH GROUNDWATER PROTECTION PROGRAM

2ND ANNUAL JOINT GOVERNMENT WATER CONFERENCE

AUGUST 19, 2014

HILO HAWAIIAN HOTEL – MOKUOLA BALLROOM

The background of the slide is a light gray gradient. It is decorated with numerous realistic water droplets of various sizes. Some droplets are at the top left, some are scattered in the middle, and a large, prominent one is in the bottom right corner. The droplets have highlights and shadows, giving them a three-dimensional appearance.

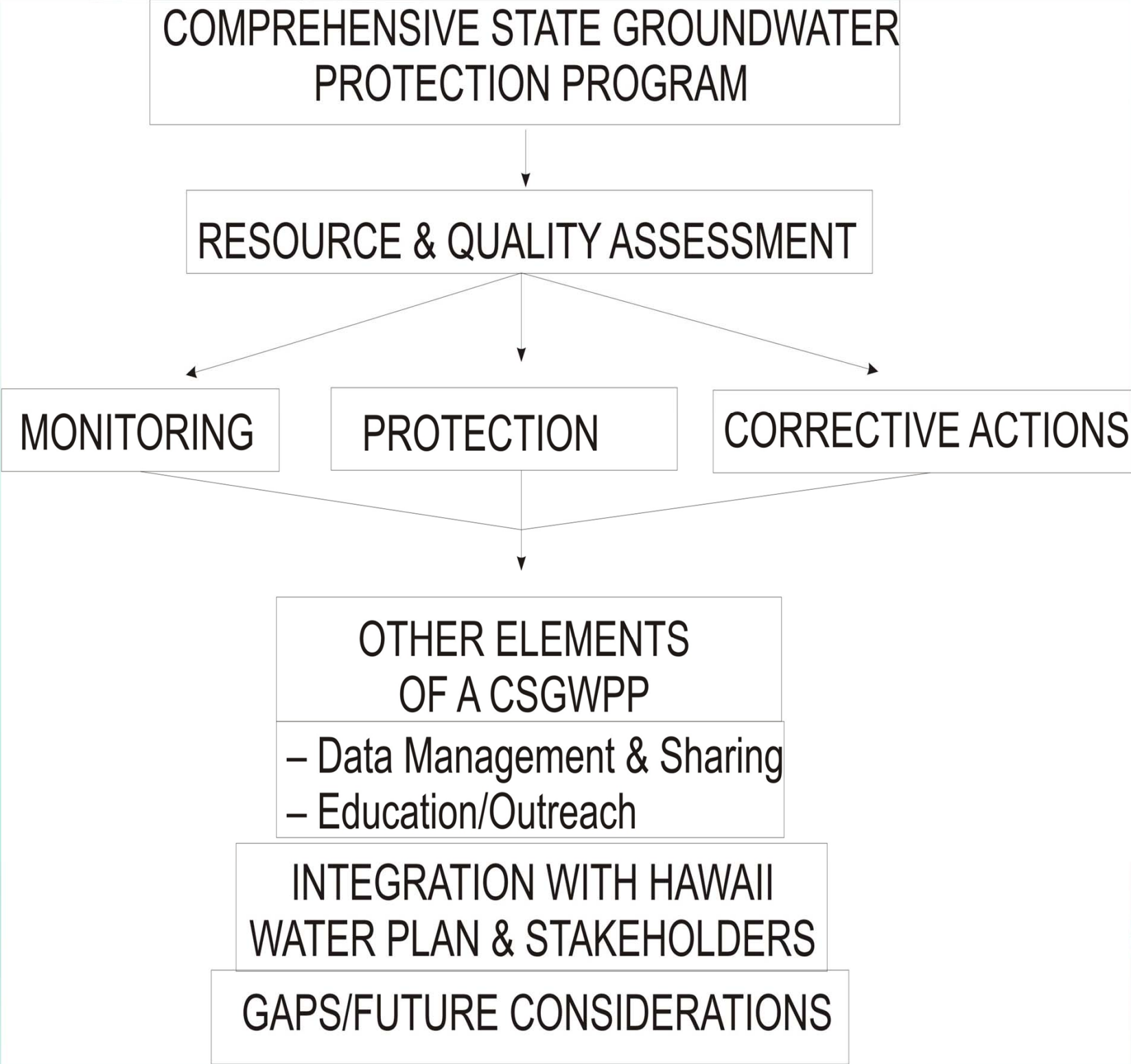
COMPONENTS OF A COMPREHENSIVE STATE GROUNDWATER PROTECTION PROGRAM

SIX (6) STRATEGIC ACTIVITIES

CSGWPP STRATEGIC ACTIVITIES

- ESTABLISH SPECIFIC GWP GOALS TO GUIDE THE RELEVANT FEDERAL, STATE, AND LOCAL PROGRAMS OPERATING WITHIN THE STATE;
- ESTABLISH PRIORITIES, BASED ON A CHARACTERIZATION OF THE RESOURCE, IDENTIFICATION OF SOURCES OF CONTAMINATION, AND DELINEATE THE PROGRAM'S NEEDS, TO GUIDE RELEVANT FEDERAL, STATE, AND LOCAL PROGRAMS AND ACTIVITIES;
- DEFINE AUTHORITIES, ROLES, RESPONSIBILITIES, AND RESOURCES, AND COORDINATING MECHANISMS BETWEEN RELEVANT FEDERAL, STATE, AND LOCAL PROGRAMS TO ADDRESS IDENTIFIED GWP PRIORITIES;
- DEFINE THE NECESSARY EFFORTS CONSISTENT WITH THE ESTABLISHED PRIORITIES, DETAIL THE RESPONSIBILITIES OF EACH PROGRAM, AND THE COORDINATION MECHANISMS BETWEEN PROGRAMS NECESSARY TO IMPLEMENT THESE EFFORTS;
- EVALUATE THE EFFECTIVENESS OF THE GWP EFFORTS BY COORDINATING INFORMATION COLLECTION TO MEASURE PROGRESS MADE TOWARD THE SPECIFIC GWP GOALS, THEN RE-EVALUATE PRIORITIES AND METHODS, AND REVISE AS-NEEDED TO INCREASE THE EFFECTIVENESS OF ALL GROUND WATER RELATED PROGRAMS; AND
- IMPROVE PUBLIC EDUCATION AND PARTICIPATION IN ALL ASPECTS OF GWP.

COMPREHENSIVE STATE GROUNDWATER PROTECTION PROGRAM



```
graph TD; A[COMPREHENSIVE STATE GROUNDWATER PROTECTION PROGRAM] --> B[RESOURCE & QUALITY ASSESSMENT]; B --> C[MONITORING]; B --> D[PROTECTION]; B --> E[CORRECTIVE ACTIONS]; C --> F[OTHER ELEMENTS OF A CSGWPP]; D --> F; E --> F; F --> G[INTEGRATION WITH HAWAII WATER PLAN & STAKEHOLDERS]; G --> H[GAPS/FUTURE CONSIDERATIONS];
```

RESOURCE & QUALITY ASSESSMENT

MONITORING

PROTECTION

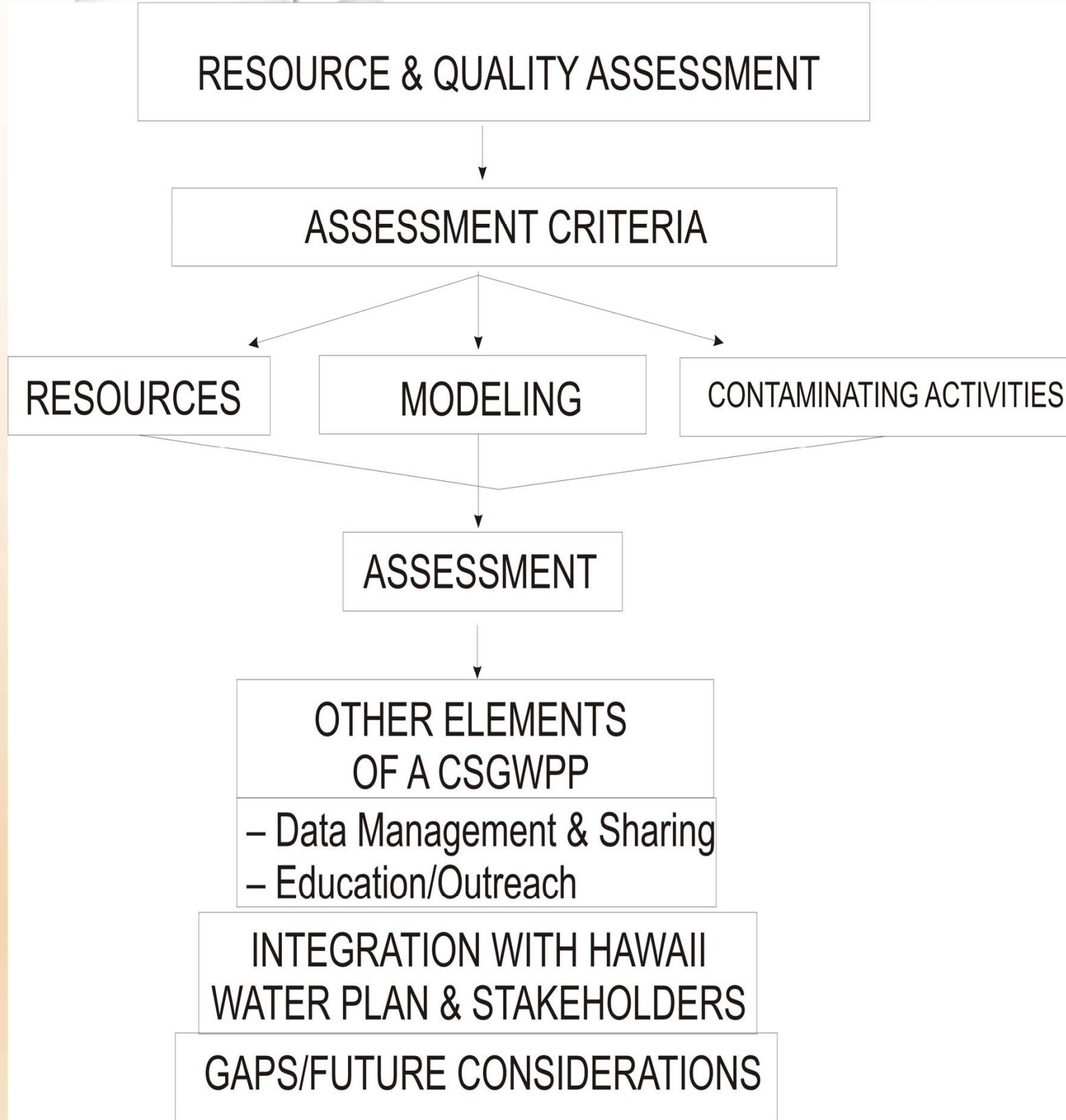
CORRECTIVE ACTIONS

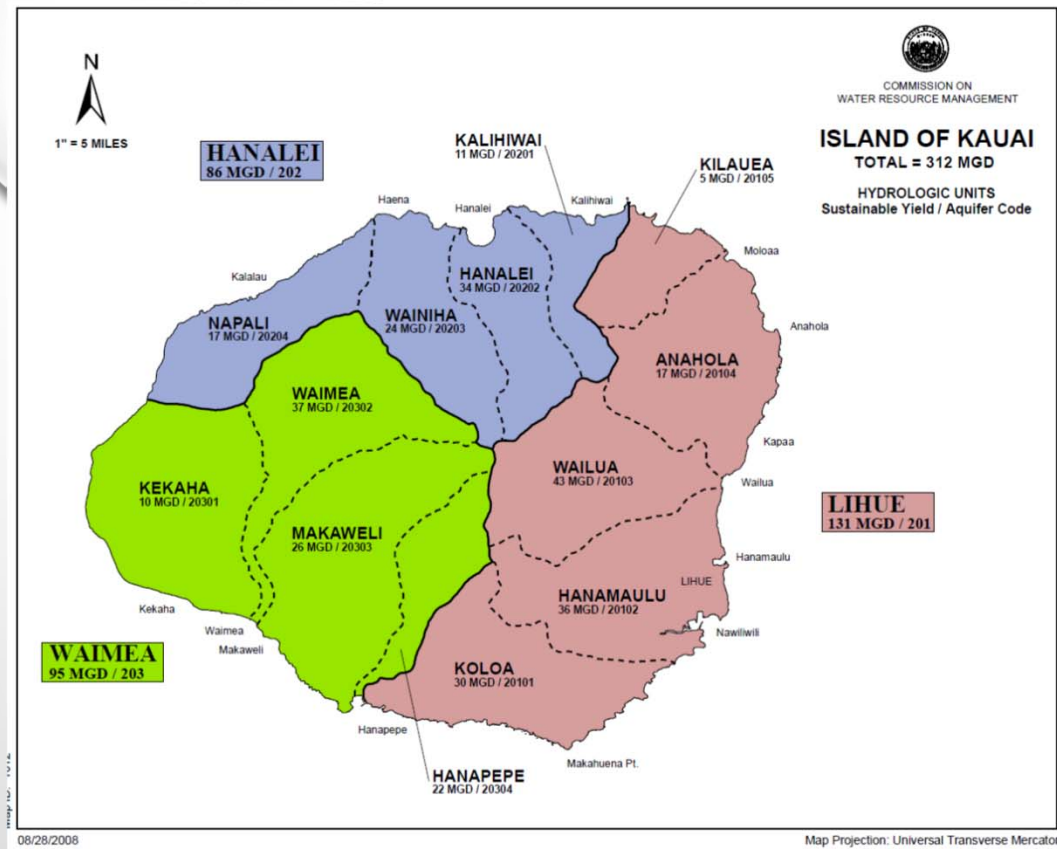
OTHER ELEMENTS OF A CSGWPP

- Data Management & Sharing
- Education/Outreach

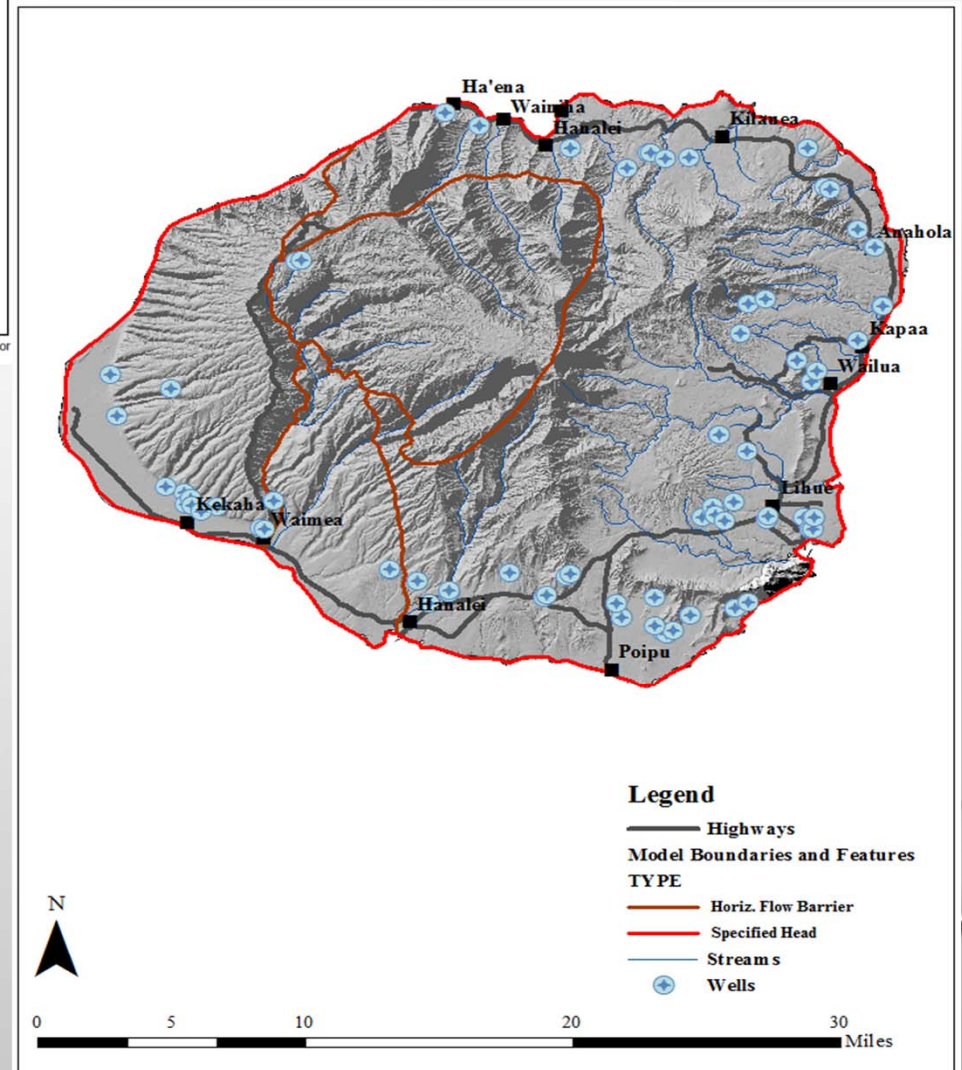
INTEGRATION WITH HAWAII
WATER PLAN & STAKEHOLDERS

GAPS/FUTURE CONSIDERATIONS



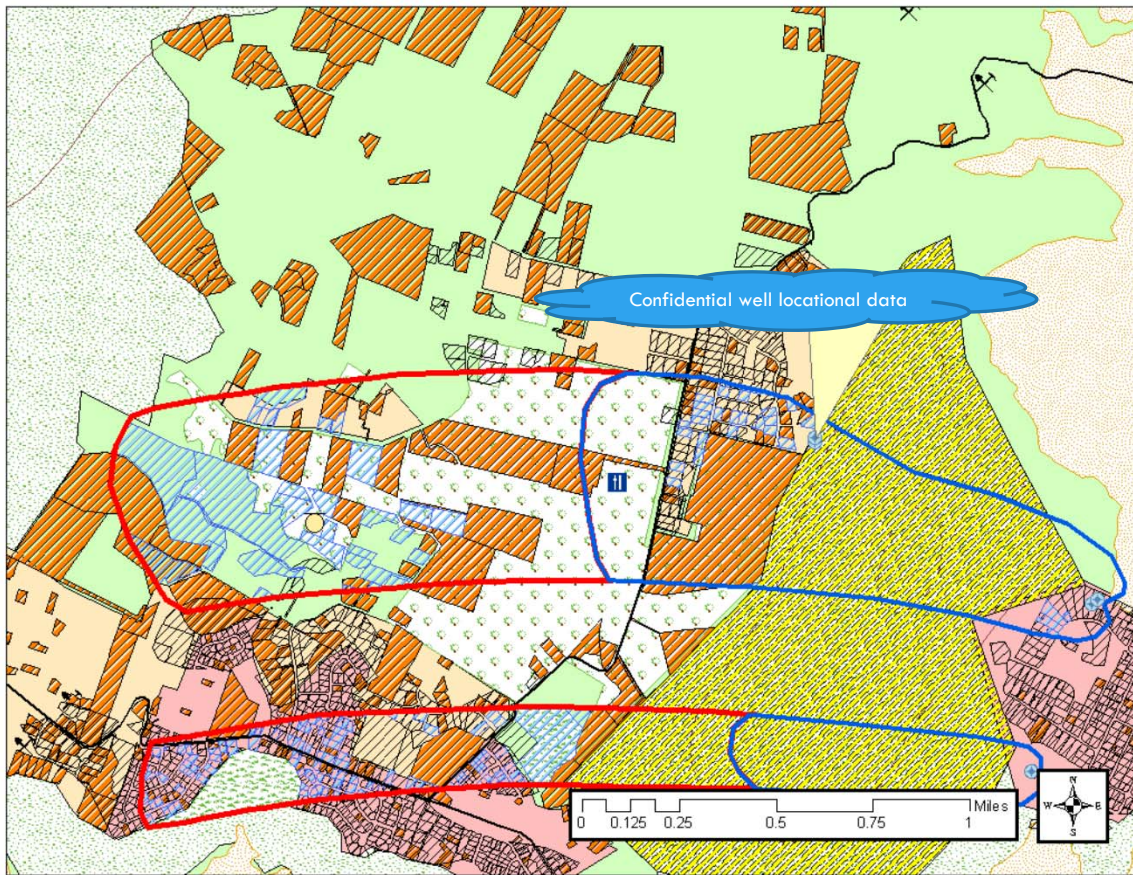


HYDROLOGIC UNITS



GROUNDWATER WELLS

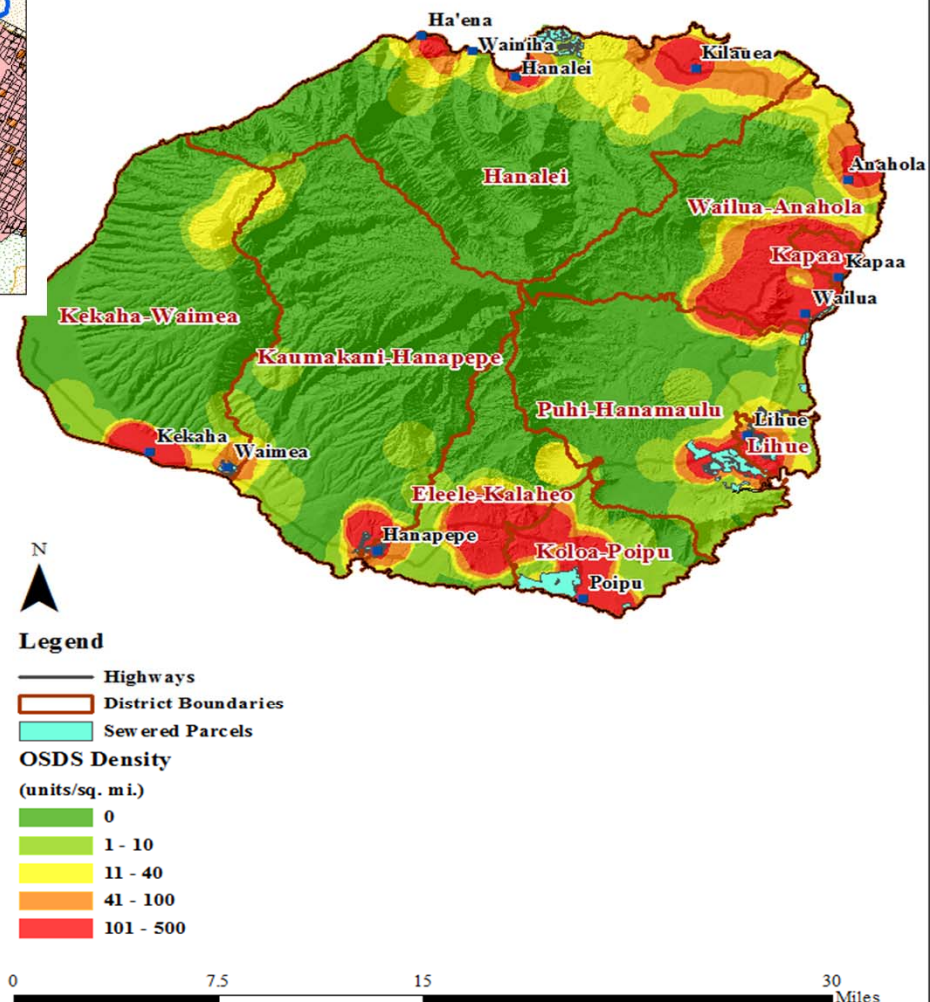
WATER RESOURCES

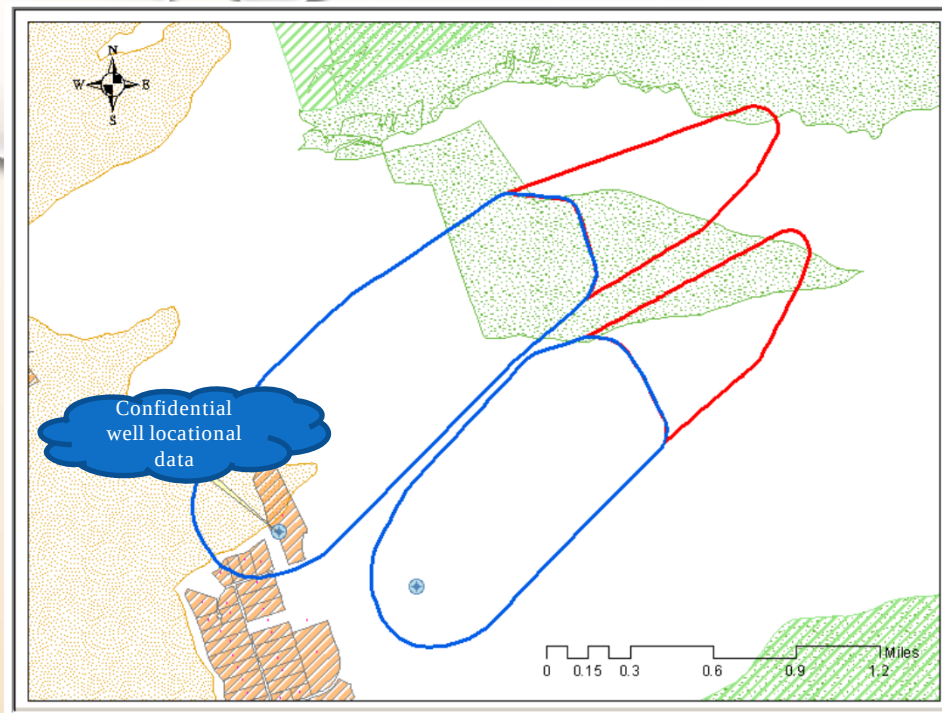


POTENTIAL CONTAMINATING ACTIVITIES INVENTORY FOR SOURCE WATER
ASSESSMENT AREA.

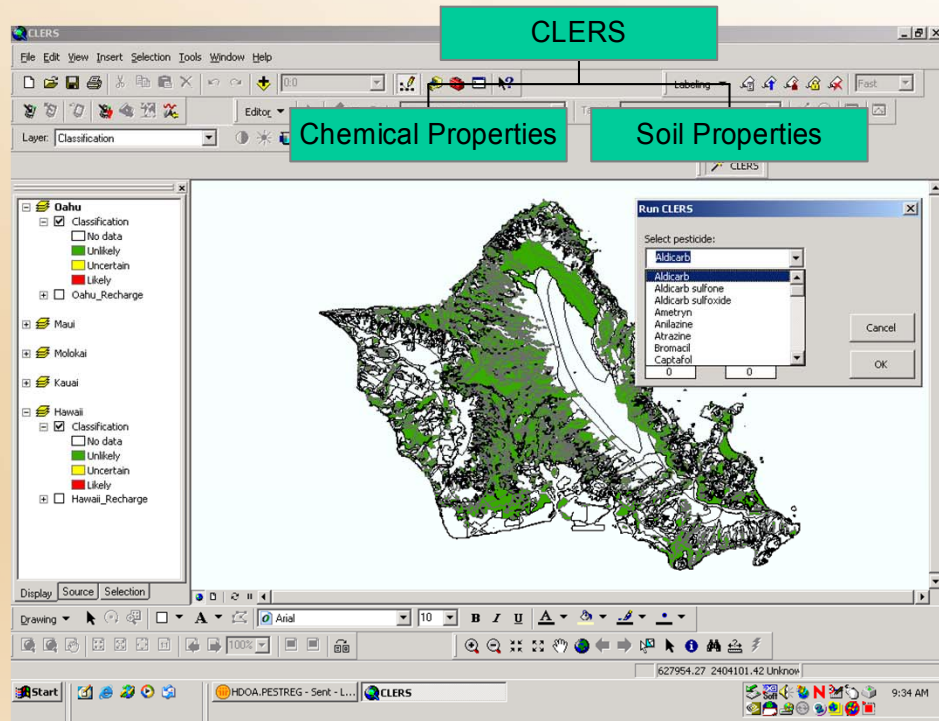
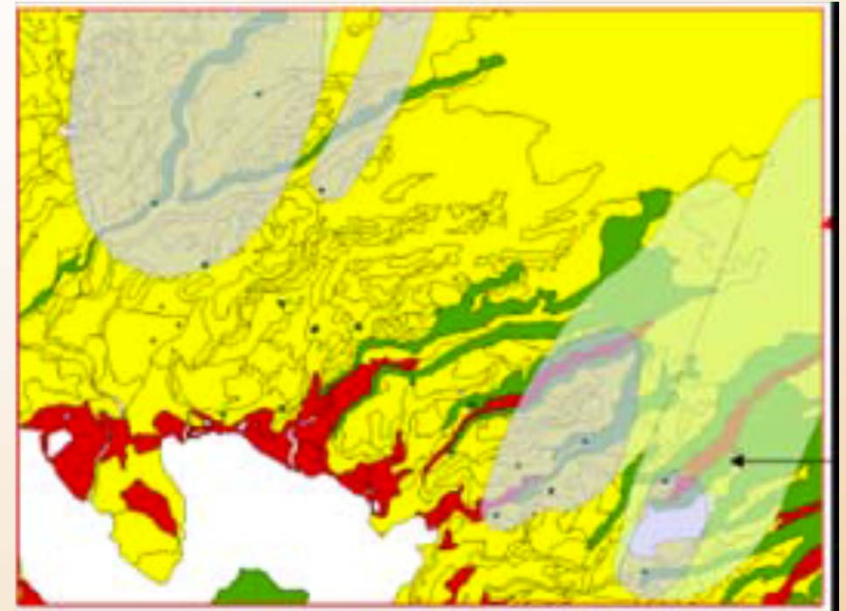
CONTAMINATING ACTIVITIES

ON-SITE WASTE DISPOSAL SYSTEM (OSDS) INVENTORY





MODELING



GW MONITORING PROGRAM

```
graph TD; A[GW MONITORING PROGRAM] --> B[COMPREHENSIVE STATE GW MONITORING & PROTECTION PLAN]; B --> C[GW QUALITY MONITORING PROJECTS]; C --> D[GW QUALITY ASSURANCE PROGRAM PLAN]; D --> E[IMPLEMENTATION OF GROUNDWATER QUALITY MONITORING PROJECTS]; E --> F[OTHER ELEMENTS OF A CSGWPP]; F --> G[INTEGRATION WITH HAWAII WATER PLAN & STAKEHOLDERS]; G --> H[GAPS/FUTURE CONSIDERATIONS];
```

**COMPREHENSIVE STATE GW
MONITORING & PROTECTION PLAN**

GW QUALITY MONITORING PROJECTS

GW QUALITY ASSURANCE PROGRAM PLAN

**IMPLEMENTATION OF GROUNDWATER
QUALITY MONITORING PROJECTS**

OTHER ELEMENTS OF A CSGWPP

- Data Management & Sharing
- Education/Outreach

INTEGRATION WITH HAWAII
WATER PLAN & STAKEHOLDERS

GAPS/FUTURE CONSIDERATIONS

GROUNDWATER QUALITY MONITORING

THE GROUNDWATER QUALITY WATER MONITORING PROGRAM CONSISTS OF A SYSTEMATIC APPROACH TO MONITORING GROUNDWATER RESOURCES BASED ON CRITERIA DEVELOPED AS PART OF HAWAII'S GROUNDWATER QUALITY MONITORING PROGRAM STRATEGY/PLAN. THE FOLLOWING IDENTIFIES THE MONITORING PROGRAM'S OBJECTIVES AND REQUIREMENTS. THERE ARE SEVERAL INSTANCES WHERE GROUNDWATER QUALITY MONITORING WILL BE PERFORMED:

- COLLECTION OF BASIC GROUNDWATER QUALITY DATA FOR USE IN ASSESSING AMBIENT GROUNDWATER QUALITY;
- COLLECTION OF GROUNDWATER QUALITY DATA TO CONFIRM DRINKING WATER MONITORING DETECTIONS OF CONTAMINANTS AND HISTORICAL DATA;
- COLLECTION OF GROUNDWATER QUALITY DATA TO ASSIST SDWB DRINKING WATER MONITORING IN DEFINING AREAL EXTENT OF DETECTED GROUNDWATER CONTAMINANTS;
- COLLECT AMBIENT GROUNDWATER QUALITY DATA IN AREAS WHERE LIMITED OR NO MONITORING HAS BEEN CONDUCTED;
- COLLECT GROUNDWATER QUALITY DATA TO ASSESS WATER QUALITY IN AREAS OF CONCERNS DUE TO POSSIBLE CONTAMINATION SOURCES; AND
- ASSIST SPECIAL PROJECTS WITH GROUNDWATER QUALITY MONITORING ACTIVITIES.

GROUNDWATER MONITORING PROJECTS

GROUNDWATER MONITORING

- **SDWB/CWRM JOINT MONITORING OF DEEP MONITORING WELLS (STATEWIDE)**
- **LAHAINA TRACER STUDY**
- **GROUNDWATER SURVEILLANCE MONITORING OF HISTORICAL CONTAMINATION DETECTED.**
- **RECLAIMED WASTEWATER MONITORING STUDY**
- **HAWAIIAN PARADISE PARK SHALLOW GW QUALITY AND IMPACTS OF OSDS STUDY.**
- **ARSENIC IN GROUNDWATER STUDY.**

SDWB/CWRM JOINT MONITORING OF DEEP MONITORING WELLS (STATEWIDE)



LAHAINA TRACER STUDY



ISLAND OF O'AHU
2005 GROUNDWATER CONTAMINATION

Legend

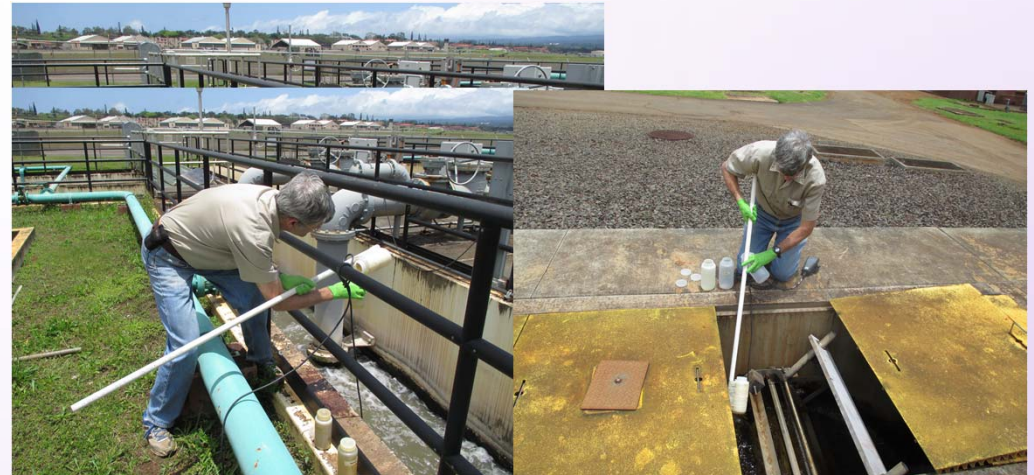
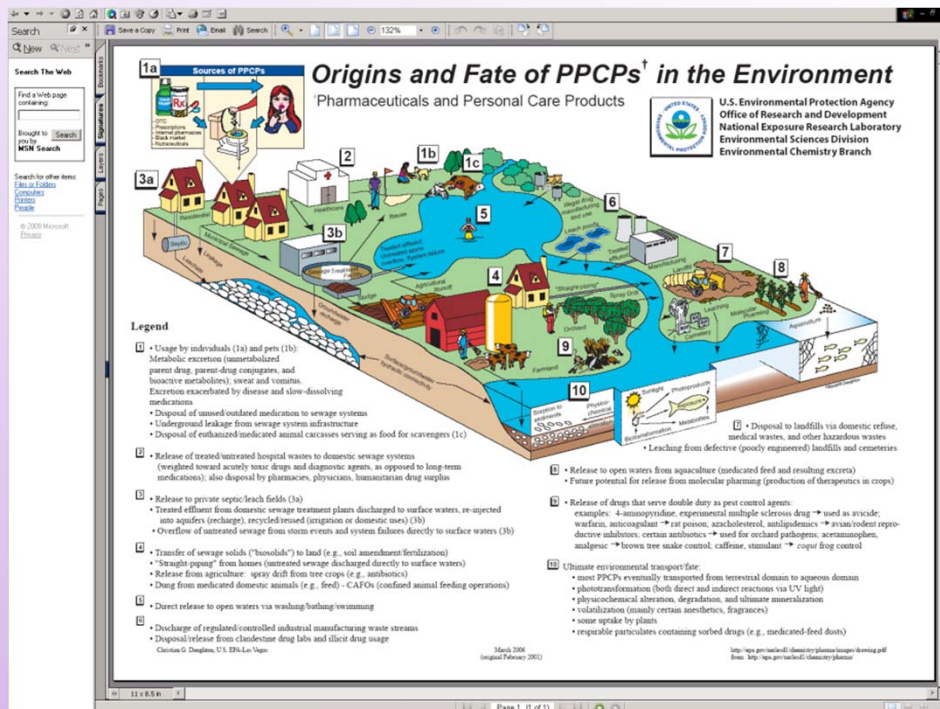
- Current Information
- Historical Monitoring Data
- Major Roads

Scale: 0 1.5 3 4.5 6 7.5 9 10 miles

Hawaii State Department of Health
July 2006

Hawaii State Department of Health
July 2006

RECLAIMED WASTEWATER MONITORING STUDY



WASTEWATER & RECLAIMED WASTEWATER SAMPLING FOR PHARMACEUTICAL & PERSONAL CARE PRODUCTS (PPCP).



IMPACTS ON GROUNDWATER.

HAWAIIAN PARADISE PARK SHALLOW GROUNDWATER MONITORING



Figure 1. Aerial photo of Hawaiian Paradise Park taken by Hawaiian Images and Photography and Video in June 2006 (Hawaii Island Plan website: <http://www.bigislandplan.com>)

ARSENIC IN GROUNDWATER STUDY

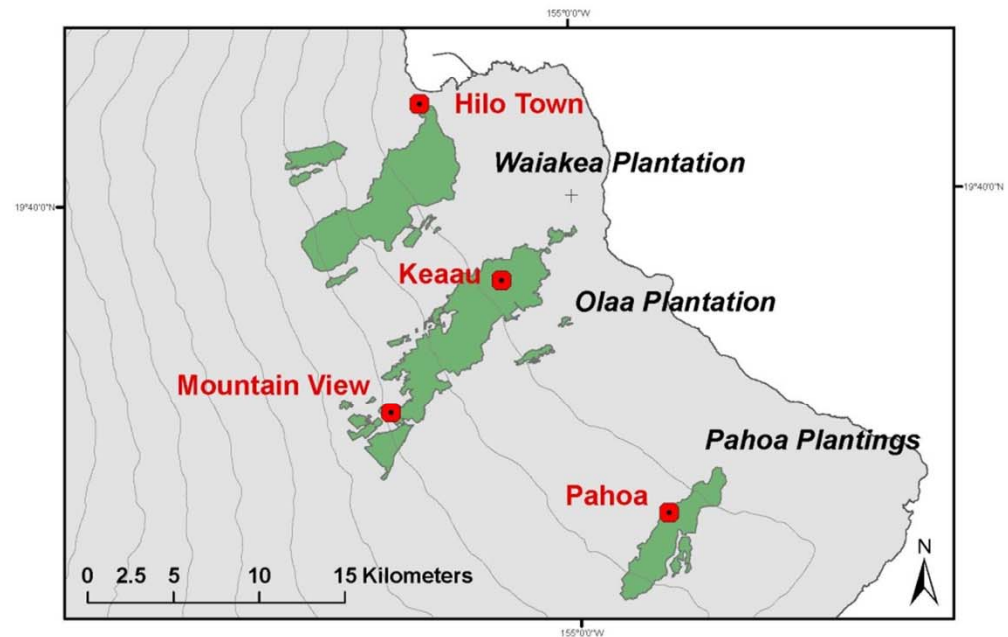


Figure 1.2 Current towns and former sugar cane plantations, eastern portion of the Island of Hawaii. Plantation extents derived from Cook (1920), Williams (1933) and Territory of Hawaii (1939).

FUTURE MONITORING PROJECTS

- **SDWB/CWRM STATEWIDE MONITORING OF CHLORIDES IN GROUNDWATER**
- **AMBIENT GROUNDWATER QUALITY MONITORING OF NON-DRINKING WATER SOURCES.**
- **MONITORING OF NON-DRINKING WATER CONTAMINANTS (INCLUDING NEW AND EMERGING CONTAMINANTS)**
- **GW QUALITY IMPACTS OF OSDS STUDY.**
- **PRIORITY WATERSHEDS – GROUNDWATER MONITORING.**

PROTECTION

DOH - SDWB	DOH - OTHERS	OTHER AGENCIES
- GWPP - SWP/WHP - UIC	- WasteWater - SHWB - HEER - CWB	- DOA - DLNR - Federal Agencies - State Agencies - County Agencies - Others

OTHER ELEMENTS OF A CSGWPP

- Data Management & Sharing
- Education/Outreach

INTEGRATION WITH HAWAII
WATER PLAN & STAKEHOLDERS

GAPS/FUTURE CONSIDERATIONS

CORRECTIVE ACTION

CONTINGENCY
PLANNING AND
RESPONSE

IMPACT
MITIGATION

REMOVAL OR
CONTROL OF
PCAs

- Regulatory
- Non-Regulatory
Voluntary

IMPROVEMENT
OF WATER
QUALITY

WATER
TREATMENT

OTHER ELEMENTS OF A CSGWPP

- Data Management & Sharing
- Education/Outreach

INTEGRATION WITH HAWAII
WATER PLAN & STAKEHOLDERS

GAPS/FUTURE CONSIDERATIONS

OTHER ELEMENTS OF A CSGWPP

- DEVELOP A CENTRALIZED GROUNDWATER DATA MANAGEMENT SYSTEM.
- DEVELOP A EDUCATION/OUTREACH PROGRAM FOR WATER PROTECTION.
- INTEGRATION WITH STAKEHOLDERS
- GAPS AND FUTURE CONSIDERATIONS

DEVELOPMENT OF AN EDUCATION/OUTREACH PROGRAM

- PREPARING AN EDUCATION/OUTREACH PLAN OUTLINING ACTIVITIES THAT CAN BE DONE TO EDUCATION AND PROMOTE WATER PROTECTION EDUCATION AND OUTREACH.

EDUCATION AND OUTREACH ACTIVITIES INCLUDE:



State Science Fair



Earth Day



WHP Public Meeting



Annual Water Conference

GAPS AND FUTURE CONSIDERATIONS

- DEVELOPMENT OF AN APPLIED SCIENCE PROGRAM IN WATER AT THE UNIVERSITY OF HAWAII.
- OTHERS

WHERE DO WE GO?

- COMPLETION OF THE WATER QUALITY PLAN
- COMPLETION OF THE COMPREHENSIVE STATE GROUNDWATER PROTECTION PROGRAM STRATEGY/PLAN
- DEVELOPMENT AND IMPLEMENTATION OF STRATEGIC ACTIVITIES
- ADDITIONAL STAFFING AND RESOURCE NEEDS