STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
P.O. BOX 621
HONOLULU, HAWAII 96809

STAFF SUBMITTAL

COMMISSION ON WATER RESOURCE MANAGEMENT

August 16, 2022
Oʻahu, Hawaiʻi

Request and Delegation of Authority to Chairperson to
Enter into a Joint Funding Agreement with U.S. Geological Survey
For Statewide Hydrologic Data Collection and
Water Resource Monitoring for Federal Fiscal Year (FFY) 2023

SUMMARY OF REQUEST

Staff recommends that the Commission on Water Resource Management (Commission) enter into a Joint Funding Agreement (Agreement) with the U.S. Geological Survey (USGS) for the inventory and investigation of Hawaiʻi's water resources.

BACKGROUND

The cooperative monitoring of Hawaiʻi's hydrologic resources began in 1909 when the USGS entered into an Agreement with the Territory of Hawaiʻi. Initially, monitoring was focused on surface water, and 12 streams were gaged continuously. By 1914, there were 87 continuous-record stations, largely serving sugarcane plantation data needs. Following statehood, the Division of Water and Land Development (DOWALD) managed the Agreement with USGS for the Department of Land and Natural Resources (DLNR) to maintain funding for many gages. The program continued to grow, reaching a peak in 1966 when 197 stream gages were operational. In 1972, ground water data collection became an integral part of the Agreement. Baseline data throughout the State covered 170 observation wells.

With the passage of the State Water Code, responsibility to coordinate monitoring programs and activities concerning water resource protection and management were transferred to the Commission. The cooperative monitoring of Hawaiʻi's hydrologic resources is part of the Commission's mandate to "maintain an inventory of all water uses and water resources" [Haw. Rev. Stat. §174C-5(14)]. The program also helps the Commission to assess how climate variability, changing land use, and increasing water demands affect water resources. Maintaining a long-term hydrologic monitoring program with the USGS is an essential component of the Commission's Water Resource Protection Plan, including:

> …the effect on the environment, procreation of aquatic life and wildlife, and water quality; study the quantity and quality of water needed for existing and contemplated uses, including irrigation, power development, geothermal power, industrial, and municipal uses; study such other related matters as drainage, reclamation, flood hazards, floodplain zoning, dam safety, and selection of reservoir sites, as they relate to the protection, conservation, quantity, and quality of water. (HAR §13-170-21)

Over the years, stream and well observation gages were discontinued for a variety of reasons. There was a shift in fiscal priorities, economic realities, completed data acquisition objectives, and reduced plantation partnership engagement as plantations ceased operations. Beginning in 1998, the Commission streamlined the Agreement by transferring the crest-stage stream-gaging program to the City and County of Honolulu (for Oʻahu) or the Department of Transportation (for neighbor islands) where this data (e.g., flooding issues) are more relevant to disaster response rather than sustainability issues. In addition, the Waiāhole Trust Fund was established in 1997 to defray the cost of monitoring the stream and rainfall gages within the region impacted by the Waiāhole Ditch.

Duplication of groundwater data collection sites were eliminated in 1998. Groundwater data gathering changed and expanded to incorporate data provided by water system purveyors and well owners, who were required by law and rule to report their water-use, water levels, and chloride levels. Commission staff has also developed in-house capacity and expertise to take over monitoring of selected well sites. As a result, the Commission's Survey Branch is assuming the monitoring of many wells previously monitored by the USGS.

During the economic recession of the mid-2000s, watershed management grant funding through the Division of Forestry and Wildlife that supported many stream gaging stations was discontinued. In order to maintain the continuity of important monitoring records, money from the Commission budget was dedicated to the operation and maintenance costs for these stations as part of the Agreement. In 2011, the Stream Protection and Management (SPAM) Branch started monitoring interim instream flow standards (interim IFS) on the island of Maui. Since that time, additional monitoring has been needed to ensure the compliance of interim IFS throughout the State.

Commission staff has also developed the in-house capacity and expertise to install, maintain, and monitor selected surface water locations. While the overall installation cost and the operation and maintenance cost per station can be much lower when Commission staff maintains a stream gaging station, staff time dedicated to this type of work takes away from the Stream Protection and Management Branch's other duties, including the development of interim instream flow standards. There is substantial staff effort (e.g., cost and time) to maintain a stream gaging station and with limited staff availability, the added cost to the Agreement is the only mechanism to collect the needed data. USGS also maintains high quality assurance and quality control standards which can be challenging for the Commission to replicate with limited staffing. An overall increase in monitoring needs as a result of new interim IFS, and a need to better understand how changes in climate patterns are affecting surface water availability, has led to an increase in the number of CWRM-funded USGS stream gaging stations. Commission staff have

also worked with other state, county, and federal agencies to support the collection of hydrological data.

Currently, Commission staff monitors 35 observation wells and maintains approximately 40 stream gaging stations (Table 1).

Table 1. Summary of current (FFY2023) total USGS and total Commission (CWRM) staff monitoring efforts as well as the breakdown of the number of CWRM funded USGS ground water and surface water monitoring stations.

	rainfall stations	observation well stations	continuous stream monitoring stations (not real-time)	real-time stream monitoring stations	continuous ditch monitoring stations
USGS total	21	35	7	80	5
CWRM total	0	35	31	12[a]	8
CWRM-USGS co-funded	17	9	7	41	0
Other cooperators	3	26	0	36	5

[a]includes stations operated by CWRM but funded by other agencies

The total cost of the Agreement, the Commission share, and the costs for operating and maintaining each type of rainfall, stream, and groundwater monitoring station has been standardized across stations and the most recent years are provided in Table 2.

The 2019 Update to the Water Resource Protection Plan identified a need to monitor the hydrological consequences of climate change across the State. Further, the 2020 USGS Hydrological Monitoring Needs Assessment for the State of Hawai‘i identified the location of new streamflow monitoring stations needed to fully implement a hydrological monitoring network to characterize the consequences of climate change. Stations re-established in locations with previous long-term streamflow monitoring can also be used to help track shifts in water availability or hydrological processes associated with climate change.

Table 2. Summary of annual cost requirements for various stations and the source of funds for the CWRM-USGS statewide hydrologic data collection agreement.

Cost of services or source of funds	FFY2019	FFY2020	FFY2021	FFY2022	FFY2023
Total Joint Funding Requirement	$870,842	$1,107,850	$932,770	$1,133,144[1]	$1,261,031
Expected (full-year) CWRM cost-share not to exceed	$624,317	$859,139	$711,475	$909,076[1]	$1,005,646
Percentage CWRM cost-share[2]	72%	78%	76%	80%	80%
Waiāhole Ditch Trust Fund	$67,200	$91,564	$84,956	$86,018	$60,552
Groundwater well continuous monitoring (per site)	$6,620	$6,740	$6,930	$9,600	$10,310
Rainfall continuous monitoring (per site)	$9,400	$9,570	$9,850	$9,960	$10,310
Streamflow continuous monitoring (per site)	$22,400	$22,800	$23,500	$23,800	$24,620

[1]Does not reflect discount applied due to FFY2021 reduced services associated with the SARS-COV-2 pandemic
[2]Does not include contributions from other agencies including HI DOT, USDA Forest Service, Maui County, Hawaii County, Mahi Pono, or Kamehameha Schools

CURRENT AGREEMENT

Rainfall Monitoring

The defacto State Climate Office was originally located under DOWALD within DLNR. DOWALD acted as a repository for climate data collected by disparate entities (mostly private agricultural companies). With the passage of the State Water Code and the establishment of the Commission, the Climate Office was transferred to the University of Hawai‘i (UH) Department of Meteorology. While UH does not serve the same function as DOWALD, they continue to be a repository for climate data and field data requests. Through the Agreement, the Commission has funded the monitoring of rainfall in important locations throughout the state for the last few decades. Rainfall stations all provide real-time continuous data that are relied upon by the Commission, Federal (e.g., National Weather Service), State and County (e.g., Departments of Civil Defense, Emergency Management, Public Works) agencies, and the public to closely monitor weather conditions. Commission staff continue to work with UH staff to implement the Hawai‘i Mesonet real-time climate monitoring network across the state.

Groundwater Monitoring

The general nature of the FFY 2023 Agreement and relationship of the parties remains the same as FFY 2021 for groundwater data collection. USGS monitors 9 ground water observation wells for the Commission, taking quarterly or bi-monthly depth and/or conductivity, temperature, and depth (CTD) profiles. In a few locations, ground water levels are monitored in real-time to protect aquifers from being over-pumped.

Streamflow Monitoring

With respect to streamflow monitoring, the Agreement in FFY 2023 will cover the installation costs of the three (3) new stations added to the Agreement in FFY 2022 and the permitting costs for additional stream gaging stations to be added to future agreements (Table 3). The installation costs vary widely depending on the location, land ownership, and accessibility. Therefore, the initial reconnaissance of these stations will provide more accurate future installation cost estimates for future agreements. In FY2020, the Commission received an increase of $240,000 in general funds to cover the costs of additional stream gaging related to the establishment or monitoring of interim IFS, especially in streams impacted by potential water leases. Stations re-established in locations with previous long-term streamflow monitoring can also be used to help track shifts in water availability or hydrological processes associated with climate change.

Shifting Cooperators for Monitoring Stations in FFY 2023 Agreement

Commission staff have requested that HI DOT fully fund the operation of USGS 16049000 on Hanapēpē River. This station does not monitor natural flow, nor could it be used to monitor a future instream flow standard. This station is more appropriately funded by agencies interested in peak flows or flooding in Hanapēpē.

The City and County of Honolulu Department of Environmental Services (DEM) originally funded USGS 16210200 on Kaukonahua Stream below Wahiawa Reservoir and USGS 1620100 Wahiawa Ditch. Due to reductions in funding, they can no longer fund these stations. Commission staff recommend adding these stations to the Agreement on a temporary basis until

the State Department of Agriculture or Agribusiness Development Agency can secure their own funding to cost-share these stations. Commission staff believe these stations provide critical data for monitoring newly established interim instream flow standards and the availability of water for agriculture dependent on the Wahiawa Ditch.

On Maui Island, the installation of one station (16647900) on Waikapū Stream 120ft above South Waikapū Ditch intake was paid for by Mahi Pono in FFY2022 and in FFY2023 Mahi Pono will assume responsibility for funding USGS 16605500 on Wailuku River, while the Commission will cost-share funding of USGS 16649700 on Waikapū Stream with USGS and HI DOT.

On Hawai‘i Island, Hawai‘i Department of Water Supply (DWS) will assume responsibility for funding USGS 16757000 on Waikoloa Stream above the Hawai‘i DWS intake. This station was previously operated as a low-flow station from 2019-2022 as part of the statewide low-flow study.

New Streamflow Monitoring Stations in FY 2023

On Hawai‘i Island, the permitting and reconnaissance costs for two stations were paid for in FFY2022 with installation and six months of operation to be paid for in FFY2023.

One station is located on Hakalau Stream at 1300ft (USGS 16717700). This station was previously operated as a low-flow station from 2018-2022 and fills a major gap in data collection along the Hāmākua Coast. The installation of real-time monitoring and 6 months of operation will be paid for in FFY2023, with costs shared by HI DOT.

One station is located on Manowai‘ōpae Stream (USGS 16717850). This station was previously operated as a low-flow station from 2018-2022 and fills a major gap in data collection along the Hāmākua Coast. The installation of real-time monitoring and 6 months of operation will be paid for in FFY2023, with costs shared by the USDA Forest Service Institute for Pacific Islands Forestry.

Existing Low-Flow Streamflow Monitoring Stations for FY 2023

In 2018, as part of the Statewide Low-Flow Study to be published soon, USGS staff installed a number of low-flow continuous monitoring stations to serve as index stations for regions of the state that lacked existing continuous streamflow monitoring. These low-flow stations (identified in the staff submittal on May 18, 2021) are being maintained through September 2022 by a separate funding agreement approved by the Commission in May 2021. Some of these stations are in process to be upgraded as real-time continuous monitoring stations. The following stations will be added to the Agreement:

On Maui Island, one station on Pi‘ina‘au Stream near Keanae (USGS 16522950) is currently operated as a low-flow station and will be added to the Agreement.

On Hawai‘i Island, one station in Awini Puali Gulch near Hawi (USGS 16751500) is currently operated as a low-flow station and will be added to the Agreement.

OTHER
I. Chapter 343 – Environmental Assessment (EA) Compliance

Environmental Assessment ("EA") Triggers
Under Hawaii Revised Statutes §343-5(a), the use of state funds triggers the need for an EA.

EA Exemption
The proposed action is exempt from an EA based on Hawaii Administrative Rule §11-200.1-15(c)(5) and the Exemption List for the Commission on Water Resource Management approved by the Environmental Council on January 5, 2021, and falls under Exemption Class 5, Part 1, No. 3, which provides for "Installation of new, small groundwater, surface water, or climatological monitoring and data collection equipment, structures that house or protect this equipment, and installation of electrical, telemetry, or communications systems to service these equipment or structures." No exemption notice is required.

Exhibits
Exhibit 1 provides a summary of changes to the program, including the operational cost, since FFY2013.

Exhibit 2 outlines the proposed scope of services. The Agreement covers FFY2023 (October 1, 2022 to September 30, 2023).

Exhibit 3 lists the stations to be funded in the FFY2023 Agreement. The total cost of the Agreement will not exceed $1,261,031. The Commission's share will not exceed $1,005,646.

RECOMMENDATIONS:

Staff recommends that the Commission:

1) Authorize the Chairperson to enter into a Joint Funding Agreement with the U.S. Geological Survey for FFY 2023 to undertake the specified monitoring activities;

2) Delegate authority to the Chairperson to modify the list of monitoring stations, provided that there is no increase in cost to the Commission; and

3) Find that this Joint Funding Agreement is exempt from the preparation of an environmental assessment under Hawaii Revised Statutes §343 based on Hawaii Administrative Rules §11-200-8(a)(5) and the Exemption List for the Department of Land and Natural Resources approved by the Environmental Council on June 5, 2015.

The terms of this Agreement are subject to the approval of the Attorney General's Office. Contract execution will be done in accordance with Hawaii Revised Statute Chapter 103D and Hawaii Administrative Rules, Chapter 3-122.

Ola i ka wai,

M. KALEO MANUEL
Deputy Director

Exhibit (s): 1. Summary of Changes to the Cooperative Program: 2013 to 2023
2. Proposed Scope of Services
3. Monitoring Stations to be funded in the FFY 2023 Agreement

APPROVED FOR SUBMITTAL:

SUZANNE D. CASE
Chairperson

SUMMARY OF CHANGES TO THE COOPERATIVE PROGRAM: 2013 to 2023

Federal Fiscal Year	Streamflow station	Groundwater stations	Rainfall stations	CWRM contribution	Changes and Comments
2013	28	18	14	$417,650	1. Waiāhole Trust Fund to provide $39,850 for Waiahole stations 2. Moanalua Stream station (16227500) added for Rain Follows the Forest Initiative
2014	25	14	15	$433,218	1. Waiāhole Trust Fund to provide $41,650 for Waiahole stations
2015	26	14	16	$444,700	1. Mt. Waiʻaleʻale Rain Gage added 2. South Fork Kaukonahua stream gage (16208000) added 3. Waiāhole Trust Fund to provide $41,650 for Waiāhole stations
2016	26	14	16	$486,933	1. CWRM cost share increases to 65% 2. Waiāhole Trust Fund to provide $41,650 for Waiāhole stations
2017	27	12	17	$494,148	1. Waiāhole Trust Fund to provide $45,264 for Waiāhole stations 2. Waimea River nr Waimea stream gage (16031000) added
2018	27	9	17	$495,520	1. CWRM cost share increases to 67% 2. CWRM staff to assume monitoring of three wells previously monitored by the USGS
2019	32	9	17	$624,317	1. Waiāhole Trust Fund to provide $67,200 for Waiāhole stations 2. Five new gaging stations added to agreement (4 stream, 1 ditch): Waiahi on Kauaʻi; Honomanū, Kahoma, Wailuku, Kauʻaula on Maui; Kauaula Ditch (Maui)
2020	39	9	17	$859,139	1. Waiāhole Trust Fund to provide $91,564 for Waiāhole stations 2. Seven new stream gaging stations added to the agreement: Waimea River, North Fork Wailua River, and Huleia Stream on Kauaʻi; Kamananui Stream on Oʻahu; Waikolu Stream and East Fork Kawela Stream on Molokaʻi; Nailiʻilihaʻele Stream on Maui.
2021	39	9	15	$696,864	1. Honolulu BWS assumes responsibility for providing cooperative funds for four streamflow gaging stations and two rainfall stations on Oahu. 2. CWRM will assume responsibility for providing cooperative funds for one station previously funded by HiEMA on Wainiha Stream, Kauai (USGS 16108000) 3. The reconnaissance costs for three new stations are provided in FY2021
2022	42	9	18	$775,932	1. Installation costs for Ukumehame, Maui, Kaupuni, Oahu, and Wailuku, Hawaii whose permitting costs were paid for in FY2021 2. Permitting costs for three new stream gaging stations added to the Agreement: Waihanau Stream, Molokaʻi; Waikapū Stream, Maui; Manowaiʻōpae Stream, Hawaiʻi
2023	47	9	18	$1,005,646	1. Installation costs for two new stream gaging stations added to the Agreement: Hakalau Stream, Hawaiʻi; Manowaiʻōpae Stream, Hawaiʻi 2. Two low-flow stations previously funded separately added to the Agreement: 16522950 Piʻinaʻau Stream, Maui; 16751500 Awini Puali, Hawaiʻi 3. Requested HI DOT take responsibility for funding 16049000 Hanapēpē River 4. Requested Hawaiʻi DWS take responsibility for funding 16757000 Waikoloa Stream

EXHIBIT 1

PROPOSED SCOPE OF SERVICES

1. This Joint Funding Agreement ("Agreement") is a continuation of the joint funding agreement for the collection of hydrological data in the State of Hawai'i between the U.S. Geological Survey, United States Department of the Interior and the Commission on Water Resource Management, Department of Land and Natural Resources, State of Hawai'i ("Commission").

2. The scope of services involves the collection and computation of data on water resources collected in multiple locations throughout the State of Hawai'i.

3. U.S. Geological Survey shall collect data at an agreed upon list of surface water stations, ground water monitoring stations, and rainfall stations, as set forth in Exhibit 3 which is attached hereto and incorporated by reference.

4. U.S. Geological Survey shall provide data summary reports and review of historical data sets.

5. U.S. Geological Survey shall host the maps, data, and reports resulting from this program in a publicly-accessible website, and shall provide the Commission staff direct and easy access to acquire, download, or transfer the data and report from a USGS server. The parties shall use good faith efforts to resolve any disagreements in the scope and validation of data acquisition and the contents of the report.

6. U.S. Geological Survey shall provide a readable statement of cooperative relations and visually identifiable symbol of the Commission as a cooperator in print, digital, and online publications of the data and reports of the monitoring stations that are included in the current cooperative program, and as well as the stations that were historically supported and funded by the Commission.

7. At least quarterly and upon request by the Commission on Water Resource Management, the U.S. Geological Survey will update the Commission on the progress of its work on this Joint Funding Agreement.

8. The Commission on Water Resource Management shall assist the U.S. Geological Survey in its work under the Joint Funding Agreement to the extent feasible and practicable under existing resources of the Commission.

MONITORING STATIONS TO BE FUNDED IN THE FFY 2023 AGREEMENT

State of Hawaii Commission on Water Resource Management
Attachment for 23ZHJFA00000001
10/1/2022 to 9/30/2023

SURFACE WATER

SITE NUMBER & DESCRIPTION	FUNDS USGS	COOP	TOTAL
16016000 Waimea River US of Kekaha-Waiahulu Int., Kauai, HI			
Full Range Streamflow Station	$5,037	$23,023	**$28,060**
16031000 Waimea River near Waimea, Kauai, HI			
Full Range Streamflow Station	$2,920	$13,310	**$16,230**
16052400 RB Lawai Stream 300ft US of fork, Kauai, HI			
Full Range Streamflow Station	$4,416	$20,184	**$24,600**
16057900 Waiahi Str US Upper Powerhouse, Kauai, HI			
Full Range Streamflow Station	$4,416	$20,184	**$24,600**
16060000 SF Wailua River nr Lihue, Kauai, HI			
Full Range Streamflow Station	$2,920	$13,310	**$16,230**
16060950 NF Wailua Riv abv N Wailua Ditch Int, Kauai, HI			
Full Range Streamflow Station	$4,416	$20,184	**$24,600**
16068000 EB of NF Wailua River nr Lihue, Kauai, HI			
Full Range Streamflow Station	$4,416	$20,184	**$24,600**
16071500 Left Branch Opaekaa Str nr Kapaa, Kauai, HI			
Full Range Streamflow Station	$2,920	$13,310	**$16,230**
16097500 Halaulani Str at alt 400 ft nr Kilauea, Kauai, HI			
Full Range Streamflow Station	$2,920	$13,310	**$16,230**
16103000 Hanalei River nr Hanalei, Kauai, HI			
Full Range Streamflow Station	$4,416	$20,184	**$24,600**
16108000 Wainiha River nr Hanalei, Kauai, HI			
Full Range Streamflow Station	$14,282	$14,778	**$29,060**
16210100 Wahiawa Ditch at Wahiawa, Oahu, HI			
Full Range Streamflow Station	$3,084	$14,096	**$17,180**
16210200 Kaukonahua Stream blw Wahiawa Reservoir, Oahu, HI			
Full Range Streamflow Station	$4,416	$20,184	**$24,600**
16211800 Kaupuni Str at alt 374 ft nr Waianae, Oahu, HI			
Full Range Streamflow Station	$4,416	$20,184	**$24,600**
16294100 Waiahole Stream above Kamehameha Hwy, Oahu, HI			
Full Range Streamflow Station	$4,416	$20,184	**$24,600**
16294900 Waikane Str at alt 75 ft at Waikane, Oahu, HI			
Full Range Streamflow Station	$4,416	$20,184	**$24,600**
16296500 Kahana Str at alt 30 ft nr Kahana, Oahu, HI			
Full Range Streamflow Station	$4,416	$20,184	**$24,600**
16301050 Punaluu Str abv Punaluu Ditch Intake, Oahu, HI			
Full Range Streamflow Station	$4,416	$20,184	**$24,600**
16325000 Kamananui Str at Pupukea Mil Rd, Oahu, HI			
Full Range Streamflow Station	$2,280	$10,420	**$12,700**
16345000 Opaeula Str nr Wahiawa, Oahu, HI			
Full Range Streamflow Station	$4,416	$20,184	**$24,600**
16408000 Waikolu Str blw pipe nr Kalaupapa, Molokai, HI			
Full Range Streamflow Station	$3,538	$16,172	**$19,710**
16409000 Waihanau Stream nr Kalaupapa, Molokai, HI			
Full Range Streamflow Station	$3,473	$15,877	**$19,350**
16415000 EF Kawela Gulch nr Kamalo, Molokai, HI			
Full Range Streamflow Station	$4,416	$20,184	**$24,600**
16417800 LB Honoulimaloo Str US diversion, Molokai, HI			
Full Range Streamflow Station	$3,473	$15,877	**$19,350**
16508000 Hanawi Stream near Nahiku, Maui, HI			
Full Range Streamflow Station	$12,300	$12,300	**$24,600**
16518000 West Wailuaiki Stream near Keanae, Maui, HI			
Full Range Streamflow Station	$17,048	$11,012	**$28,060**
16522950 Piinaau Str 470 ft US Koolau Ditch, Maui, HI			
Full Range Streamflow Station	$3,473	$15,877	**$19,350**
16527500 Honomanu Stream near Hana Hwy, Maui, HI			
Full Range Streamflow Station	$2,920	$13,310	**$16,230**
16570000 Nailiilihaele Stream near Huelo, Maui, HI			
Full Range Streamflow Station	$4,416	$20,184	**$24,600**
16587000 Honopou Stream near Huelo, Maui, HI			
Full Range Streamflow Station	$4,416	$20,184	**$24,600**
16604500 Wailuku River at Kepaniwai Park, Maui, HI			
Full Range Streamflow Station	$2,920	$13,310	**$16,230**
16614000 Waihee Rv abv Waihee Dtch intk nr Waihee, Maui, HI			
Full Range Streamflow Station	$2,920	$13,310	**$16,230**
16620000 Honokohau Stream near Honokohau, Maui, HI			
Full Range Streamflow Station	$5,037	$23,023	**$28,060**

16638500 Kahoma Stream at Lahaina, Maui, HI			
Full Range Streamflow Station	$2,920	$13,310	**$16,230**
16641000 Kauaula Stream US of ditch diversion, Maui, HI			
Full Range Streamflow Station	$4,416	$20,184	**$24,600**
16643100 Kauaula Stream DS of ditch diversion, Maui, HI			
Full Range Streamflow Station	$3,473	$15,877	**$19,350**
16647000 Ukumehame Gulch nr Olowalu, Maui, HI			
Full Range Streamflow Station	$2,917	$13,333	**$16,250**
16647900			
Full Range Streamflow Station	$2,920	$13,310	**$16,230**
16701800 Wailuku River nr Kaumana, HI			
Full Range Streamflow Station	$4,416	$20,184	**$24,600**
16704000 Wailuku River at Piihonua, HI			
Full Range Streamflow Station	$4,416	$20,184	**$24,600**
16717000 Honolii Stream nr Papaikou, HI			
Full Range Streamflow Station	$2,917	$13,333	**$16,250**
16717700 Hakalau Stream nr alt 1300 ft, HI			
Full Range Streamflow Station	$6,426	$29,374	**$35,800**
16717815 Manowaiopae Stream near Spencer Road, HI			
Full Range Streamflow Station	$5,919	$27,056	**$32,975**
16720000 Kawainui Stream nr Kamuela, HI			
Full Range Streamflow Station	$4,416	$20,184	**$24,600**
16725000 Alakahi Stream near Kamuela, HI			
Full Range Streamflow Station	$2,917	$13,333	**$16,250**
16751500 Awini Puali Gulch US of Kohala Ditch, HI			
Full Range Streamflow Station	$3,473	$15,877	**$19,350**
16770500 Paauau Gulch at Pahala, HI			
Full Range Streamflow Station	$2,917	$13,333	**$16,250**
194117155174801 83.0 Quarry Rain Gage at Saddle Rd, HI			
Rainfall Real Time	$1,851	$8,459	**$10,310**
194602155091801 125.12 Honolii Rain Gage near Papaikou, HI			
Rainfall Real Time	$1,208	$5,522	**$6,730**
194945155534402 92.5 Kiholo Rain Gage, HI			
Rainfall Real Time	$1,851	$8,459	**$10,310**
200518155405801 185.7 Kawainui Rain Gage near Kamuela, HI			
Rainfall Real Time	$1,851	$8,459	**$10,310**
203721156151601 255.0 Kepuni Gulch Rain Gage, Maui, HI			
Rainfall Real Time	$1,851	$8,459	**$10,310**
204916156083701 348.5 West Wailuaiki Rain Gage nr Keanae, Maui, HI			
Rainfall Real Time	$1,851	$8,459	**$10,310**
205735156351301			
Rainfall Real Time	$1,208	$5,522	**$6,730**
212855157504501 837.7 Waiahole RG at Kamehameha Hwy., Oahu, HI			
Rainfall Real Time	$1,851	$8,459	**$10,310**
213237157530701 886.4 Kahana Rain Gage at alt. 95 ft., Oahu, HI			
Rainfall Real Time	$1,851	$8,459	**$10,310**
213608158011101 897.9 Pupukea Rd Rain Gage at alt 1,160 ft,Oahu,HI			
Rainfall Real Time	$1,851	$8,459	**$10,310**
213732158010201 897.11 Kamananui Rain Gage at alt. 720 ft, Oahu,HI			
Rainfall Real Time	$1,851	$8,459	**$10,310**
220122159275401 10545.0 Waiahi RG at alt. 815 ft., Kauai, HI			
Rainfall Real Time	$1,208	$5,522	**$6,730**
220356159281401 1051.0 N Wailua Ditch Rain Gage nr Lihue, Kauai,HI			
Rainfall Real Time	$2,472	$11,298	**$13,770**
220427159300201 1047.0 Mt. Waialeale Rain Gage nr Lihue, Kauai, HI			
Rainfall Real Time	$2,472	$11,298	**$13,770**
220523159341201 1042.0 Waialae Rain Gage nr Waimea, Kauai, HI			
Rainfall Real Time	$1,851	$8,459	**$10,310**
220713159361201 1083.0 Mohihi Crsg Rain Gage nr Waimea, Kauai, HI			
Rainfall Real Time	$1,851	$8,459	**$10,310**
220739159373001 1082.0 Waiakoali Rain Gage nr Waimea, Kauai, HI			
Rainfall Real Time	$1,851	$8,459	**$10,310**
220927159355001 1084.0 Kilohana Rain Gage nr Hanalei, Kauai, HI			
Rainfall Real Time	$2,472	$11,298	**$13,770**
	Total:	**$247,420**	**$969,225**	**$1,216,645**

SITE NUMBER & DESCRIPTION	FUNDS USGS	COOP	TOTAL
210825157004301 4-0800-01 Kualapuu Deep Monitor Well, Molokai, HI			
miscellaneous QW	$1,477	$6,753	**$8,230**
Total:	**$1,477**	**$6,753**	**$8,230**

GROUND WATER

SITE NUMBER & DESCRIPTION	FUNDS USGS	COOP	TOTAL
205405156305401 6-5430-05 Waiehu Deep Monitor Well, Maui, HI			
Ground Water Water Level Continuous	$1,303	$5,957	**$7,260**
210402156495801 4-0449-01 Ualapue Shaft (S6), Molokai, HI			
Ground Water Water Level	$610	$2,790	**$3,400**
211832157515501 3-1851-19 Halekauwila Street, Pipe A, Oahu, HI			
Ground Water Water Level	$1,026	$4,692	**$5,718**
211832157515502 3-1851-19 Halekauwila Street, Pipe B, Oahu, HI			
Ground Water Water Level	$1,026	$4,692	**$5,718**
212154158015201 3-2101-03 Honouliuli (W266), Oahu, HI			
Ground Water Water Level	$610	$2,790	**$3,400**
212238157561101 3-2256-10 Aiea Bay nr Naval Res (187-B), Oahu, HI			
Ground Water Water Level Continuous	$1,303	$5,957	**$7,260**
215607159344301 2-5634-01 Hanapepe Ridge, Kauai, HI			
Ground Water Water Level	$610	$2,790	**$3,400**
Total:	**$6,488**	**$29,668**	**$36,156**

GRAND TOTAL: $255,385 $1,005,646 $1,261,031