CONTRACT ROUTING FORM

Date: August 28, 2024

Department: Planning

Contact: Dawn Johnston (Name) 961-8130 (Telephone Extension)

Name of Contractor: US Geological Survey

Vendor Number: 87942 ~~55584~~ *(If none, complete Form V-8 and forward to Accounts for assignment of vendor number before processing contract)*

Purpose /Title of Contract: USGS Groundwater Study of Lower Puna

☐ Employment ☒ Inter-Government

☐ PRC Approval Date (Employment): _____ ☐ ERC Approval Date (If Applicable): _____

Account No. to Charge: 095.141.5143.02.115 Fiscal Year : 2024-25 8/30/24

Amount of Contract: 428,000.00 FRESH Req. No.: pl.01007

Procurement Approval: OK Contract No.: C.012054

For contracts requiring multi-year commitments, acceptance of federal funds or funds in a future FY:

Council Resolution Number: 443-24 Date Approved: 3/20/24
(Attach copy of resolution)

Route to:

☒ **Contractor** *(Review and sign contract before notary public)*
Date completed & forwarded to next: _____

☒ **Department Head(s)** *(Signature(s) recommending approval)*
Date completed & forwarded to next: AUG 28 2024 (Additional

☒ **Human Resources** *(Director of Human Resources' certification, required for a contract for services which are exempt pursuant to HRS §76-77 (7), (8) or (12) only. Director of Human Resources review required for requests for exemption under HRS§76-77(16))*
Date completed & forwarded to next: 8/30/2024

☒ **Purchasing Agent** *(Procurement review and reporting)*
Date completed & forwarded to next: AUG 30 2024

☒ **Controller/Director of Finance** *(Certification of funds)* AUG 30 2024
Date completed & forwarded to next: _____

☒ **Corporation Counsel** *(Approve as to form and legality)*
Date completed & forwarded to next: 30 Aug 24

☒ **Mayor** *(Review, notarized signature and date)*
Date completed & returned to originating Dept: August 30, 2024

RECEIVED 2024 AUG 30 P 1:18 OFFICE OF THE MAYOR COUNTY OF HAWAI'I

RETURN TO DEPARTMENT REQUESTING CERTIFICATION
for issuance of notice to proceed and distribution of contract copies to affected parties and Controller

456386

CHECKLIST FOR CONTRACTS

(For Informational Purposes Only – Not Required to be Completed)

	Initial	Date
Included in the contract:		
Sec. 103D-310 (see also HAR §3-122-112)		
Sec. 104 prevailing wages for construction exceeding $2,000		
Sec. 103-55 wage certificate requirement (services over $25,000)		
Inclusion of current applicable general conditions by reference		
Inclusion of federally mandated terms or use of federal forms if federal funding involved		
Federal or State Grant funds utilized		
On the contract:		
Departmental recommendation of approval	DT	8/28/24
Notarized signature of authorized representative of contractor		
Notarized signature of bonding agent (if applicable)		
Corporate seal of contractor (if applicable)		
Appropriate clause for procurement exemption under HAR §3-120-4(g) (if applicable)		
Appropriate clause regarding exemption from civil service (if applicable)		
Attached to contract:		
Hawaii Compliance Express Certificate showing the vendor as compliant. In accordance with HRS Section 103-53.		
Bond (if non-construction or under $5,000, attach chief procurement officer's approval to require bond)		
Finance Director's certification of availability of funds		
Resolution of corporate or partnership authority		
Sec. 103-55 wage certificate (if services over $25,000)		
Insurance certificate(s) (if applicable)		
Sec. 103-55 wage certificate (if services over $25,000)		
Other:		

PROCUREMENT INFORMATION

The information below is required so that Purchasing Division and Corporation Counsel can determine if proper procurement procedures were followed in selection of contractor.

Bid No.: _____ (IFB or RFP) Job No.: _____

Vendor selected by:

**Attach certified cost and pricing data from vendor if $100,000 or more.*

- ☐ Competitive sealed bidding (IFB) (HRS §103D-302)
- ☐ Competitive sealed proposals (RFP) (HRS §103D-303)
- ☐ Professional services procurement (HRS § 103D-304)
  (complete and attach Professional Services Data - Form F-111P)*
- ☐ Small purchases (under $25,000) (HRS §103D-305)
- ☐ Sole source procurement (attach approval) (HRS §103D-306)*
- ☐ Emergency procurement (attach approval) (HRS §103D-307)*
- ☒ Exempt from State Procurement Code:

Reason: This is an inter-governmental agreement which is exempt

Statutory/H.A.R. Authority: HRS 103D-102(b)(2)(G)

Required Website Posting: State _____ (Date) County _____ (Date)

Optional Advertising: ☐ Hawai'i Tribune-Herald ☐ West Hawai'i Today

☐ Other: _____

Date(s) advertised: _____

Date of Pre-Bid Conference (if any): _____

Bid opening date or deadline for receipt of proposals: _____

Number of responses: _____ *(Attach recap of responses to IFB, RFP, or quotation requests)*

(If only one response, see Procurement Rules, Sec. 3-122-35 for IFBs or 3-122-59 for RFPs)

Was awardee lowest dollar offer? Yes ☐ No ☐

If no, explain award (use extra page if more space needed):

I, Dawn Johnston (print name), am employed by the County of Hawai'i

in the capacity of Administrative Services Officer I (position) and hereby verify that the

information stated above is true and accurate in the best of my knowledge.

8/28/24 D Johnston 961-8130

Date) (Signature) (Extension No.)

Department Head Certification Regarding Civil Service Exemption: CHOOSE ONE ONLY!

☐ I certify that to the best of my knowledge, this contract is for goods only and any services provided are incidental to the delivery, installation and/or warranty/maintenance of said goods.

_____ _____
Department Head Date

Or

☒ I certify that to the best of my knowledge, services to be performed under this contract have not been customarily and historically performed by Hawai'i County civil servants.

_____ AUG 28 2024
Department Head Date

Or

☐ I certify that the services to be performed under this contract are exempt from civil service pursuant to §76-77(___), Hawai'i Revised Statutes.

_____ _____
Department Head Date

(This box is NOT to be checked for exemption under §76-77(7), (8), or (12). For exemptions under Section 76-77(7), (8) or (12) complete Attachment A, B or C of Department of Human Resources Procedures on "Contracting Services and Civil Service Exemptions" and submit to Director of Human Resources for approval with appropriate clause on signature page of contract.)

Or

☐ I certify that the services to be performed under this contract are exempt from civil service pursuant to §76-77(16), Hawai'i Revised Statutes, as it is for positions or contracts for personal services with private persons or entities for services lasting no more than one year and at a cost of no more than $750,000.

_____ _____
Department Head Date

(Note: Attachment D of Department of Human Resources Procedures on "Contracting Services and Civil Service Exemptions "must be completed and included with the Contract Routing Form for review by the Director of Human Resources.)

(If more than one department or agency involved, complete a copy of this page for <u>each.</u>)

COUNTY OF HAWAI'I

DEPARTMENT OF FINANCE - PURCHASING DIVISION
25 AUPUNI STREET
HILO, HAWAI'I 96720
(808)961-8231 FAX (808) 961-8248

ORIGINAL PO DATE	PO NUMBER
08/30/2024	C.012054

Hawaii County is an Equal Opportunity Provider and Employer

SHIP TO: KILAUEA RECOVERY HOUSING
BUYOUT PROGRAM
100 PAUAHI STREET, STE. 200
HILO, HI 96720

Special Inst:

VENDOR: 87942
DOI USGS PIWSC US GEOLOGICAL SURVEY
PO BOX 6200-27
PORTLAND, OR 97228-6200

FOB Point:
Terms: A/P Net 30 Days
Req. Del. Date:
Req. No.: pl.01007
Dept.:
Contact Name: JOHNSTON, DAWN
Contact Phone: (808) 961-8130
Confirming? No (If Yes, DO NOT Duplicate)

Quantity	Unit	Description	Unit Price	Ext. Price
		CONTRACT TO USE GEOTHERMAL RELOCATION AND COMMUNITY BENEFITS FUNDS FOR A USGS GROUNDWATER STUDY FOR PUNA. DISTRICT OF HAWAII. GEOTHERMAL RELOCATION AND COMMUNITY BENEFITS FUND.		428,000.00

SUBTOTAL	428,000.00
TAX	0.00
FREIGHT	0.00
TOTAL	428,000.00

BILL TO: PLANNING DEPARTMENT
101 PAUAHI ST
SUITE 3
HILO, HI 96720

INSTRUCTIONS: This order is subject to the terms and conditions of the above referenced Request for Quotes (RFQ), Invitation for Bids (IFB) or Request for Proposals (RFP). Shipping and freight charges shall be FOB Destination Prepaid and Allowed unless otherwise noted. Invoices shall include the Purchase Order Number, with the original invoice and one copy being mailed or delivered to the BILL TO: address listed above. No changes or modifications to the terms, quantities or specifications shall be made without written authorization from the Purchasing Division.

Lia Takagawa
PURCHASING AGENT

United States Department of the Interior

U.S. GEOLOGICAL SURVEY
Pacific Islands Water Science Center
1845 Wasp Blvd, Bld 176
Honolulu, HI 96818

June 17, 2024

ZendoKem
Planning Director
County of Hawaii
101 Pauahi Street Suite 3
Hilo, HI 96720-4224

Dear Zendo Kem.:

Enclosed is our standard joint-funding agreement (TBD) between the U.S. Geological Survey Pacific Islands Water Science Center and County of Hawaii for negotiated deliverables (see attached), during the period September 1, 2024 through August 31, 2027 in the amount of $428,000 from your agency. U.S. Geological Survey contributions for this agreement are $42,800 for a combined total of$470,800. Please sign and return one fully-executed original to Bles May Daog at bdaog@usgs.gov or mail to the address above.

Federal law requires that we have a signed agreement before we start or continue work. Please return the signed agreement by **September 1, 2024.** If, for any reason, the agreement cannot be signed and returned by the date shown above, please contact Stephen Zahniser at (808) 690-9595 or email szahniser@usgs.gov to make alternative arrangements.

This is a fixed cost agreement to be billed quarterly via Down Payment Request (automated Form DI-1040). Please allow 30-days from the end of the billing period for issuance of the bill. If you experience any problems with your invoice(s), please contact Bles May Daog at phone number (808) 690-9601 or bdaog@usgs.gov.

The results of all work performed under this agreement will be available for publication by the U.S. Geological Survey. We look forward to continuing this and future cooperative efforts in these mutually beneficial water resources studies.

Sincerely,

John P. Hoffmann

John P. Hoffmann
Center Director

Enclosure
Joint Funding Agreement

Form 9-1366
(May 2018)

U.S. Department of the Interior
U.S. Geological Survey
Joint Funding Agreement
FOR
Water Resource Investigations

Customer#:6000001200
Agreement #: TBD
Project #: TBD
TIN#: 99-6000567

Fixed Cost Agreement YES[X] NO[ ]

THIS AGREEMENT is entered into as of the September 1, 2024, by the U.S. GEOLOGICAL SURVEY, Pacific Islands Water Science Center, UNITED STATES DEPARTMENT OF THE INTERIOR, party of the first part, and the County of Hawaii Department of Public Works party of the second part.

1. The parties hereto agree that subject to the availability of appropriations and in accordance with their respective authorities there shall be maintained in cooperation for negotiated deliverables (see attached), herein called the program. The USGS legal authority is 43 USC 36C; 43 USC 50, and 43 USC 50b.

2. The following amounts shall be contributed to cover all of the cost of the necessary field and analytical work directly related to this program. 2(b) include In-Kind-Services in the amount of $0.00

(a) $42,800 by the party of the first part during the period September 1, 2024 to August 31, 2027

(b) $428,000 by the party of the second part during the period September 1, 2024 to August 31, 2027

(c) Contributions are provided by the party of the first part through other USGS regional or national programs, in the amount of: $0

Description of the USGS regional/national program:

(d) Additional or reduced amounts by each party during the above period or succeeding periods as may be determined by mutual agreement and set forth in an exchange of letters between the parties.

(e) The performance period may be changed by mutual agreement and set forth in an exchange of letters between the parties.

3. The costs of this program may be paid by either party in conformity with the laws and regulations respectively governing each party.

4. The field and analytical work pertaining to this program shall be under the direction of or subject to periodic review by an authorized representative of the party of the first part.

5. The areas to be included in the program shall be determined by mutual agreement between the parties hereto or their authorized representatives. The methods employed in the field and office shall be those adopted by the party of the first part to insure the required standards of accuracy subject to modification by mutual agreement.

6. During the course of this program, all field and analytical work of either party pertaining to this program shall be open to the inspection of the other party, and if the work is not being carried on in a mutually satisfactory manner, either party may terminate this agreement upon 60 days written notice to the other party.

7. The original records resulting from this program will be deposited in the office of origin of those records. Upon request, copies of the original records will be provided to the office of the other party.

8. The maps, records or reports resulting from this program shall be made available to the public as promptly as possible. The maps, records or reports normally will be published by the party of the first part. However, the party of the second part reserves the right to publish the results of this program, and if already published by the party of the first part shall, upon request, be furnished by the party of the first part, at cost, impressions suitable for purposes of reproduction similar to that for which the original copy was prepared. The maps, records or reports published by either party shall contain a statement of the cooperative relations between the parties. The Parties acknowledge that scientific information and data developed as a result of the Scope of Work (SOW) are subject to applicable USGS review, approval, and release requirements, which are available on the USGS Fundamental Science Practices website (https://www.usgs.gov/office-of-science-quality-and-integrity/fundamental-science-practices).

COUNTY OF HAWAII
CERTIFICATION OF AVAILABILITY OF FUNDS

I hereby certify that on the date of filing of this contract with the Director of Finance, there remains an unexpended amount of

$ 428,000.00 095.141.5143.02.115

sufficient to cover the obligation of the County of Hawaii under this contract in fiscal year 2024-2025.

Contract Title: **USGS Groundwater Study of Lower Puna; Reso 443-24.**

Vendor: **US Geological Survey**

Contract No: **C.012054**

Director of Finance
Date: August 30, 2024

ACCEPTED BY:
County of Hawai'i

By: _____
Name: DEANNA S. SAKO
Its: Managing Director
Date: August 30, 2024

RECOMMENDED APPROVALS:

_____
~~Diane Nakagawa~~ Zendo Kern
~~Finance Director~~ Planning Director
County of Hawai'i

APPROVED AS TO FORM AND LEGALITY:

_____
Name: Frank Kamanena
Deputy Corporation Counsel
County of Hawai'i

Proposal for Groundwater Sampling for Geothermal Indicators in the Puna area, Hawai'i
U.S. Geological Survey
Pacific Islands Water Science Center
November 2023

Project Overview

Geothermal energy production in the Puna area of southeast Hawai'i (Figure 1) can potentially affect groundwater resources and coastal ecosystems through reinjection of geothermal fluids, pressure decline in subsurface reservoirs, or chemical spills at the surface (Iovenitti, 1990; Sorey and Colvard, 1994; Kristmannsdóttir and Ármannsson, 2003; Rybach, 2003). Existing geothermal production wells in the Puna area (Figure 1) generally are near a ground-surface altitude of about 600 to 800 feet and were drilled to depths of about 4,000 to 6,000 feet, whereas the nearby injection wells were drilled to depths of about 6,000 to 8,000 feet (U.S. Environmental Protection Agency, 2020). Conditions of the injection permit addressing well construction, injection depths, monitoring, and operation procedures (U.S. Environmental Agency, 2021) are designed to limit the potential for adverse effects on groundwater resources. No groundwater contamination related to geothermal activities is known to have occurred in the Puna area to date (Evans and others, 2015), although environmental and health concerns related to geothermal energy production exist (AP News, 2020). The 2018 eruption of Kīlauea volcano that resulted in the temporary closure of the Puna Geothermal Venture (PGV) plant and covered three wells with lava heightened concerns related to geothermal energy production (Armstrong, 2018; Perez, 2018; CNBC, 2018).

Prior to the 2018 eruption of Kīlauea volcano, the U.S. Geological Survey (USGS) collected water samples from deep geothermal wells, public-supply wells, and coastal springs to evaluate whether geothermal operations have affected groundwater quality (Evans and others, 2015). The samples were analyzed for major and minor chemical species, trace metals, stable isotopes of water, and two organic compounds used at the power plant as part of the heat-exchange process (pentane) or as an additive to control corrosion in the pipelines (isopropanol). Following the 2018 eruption of Kīlauea volcano, the USGS (McClesky and others, 2020) collected additional water samples mostly during 2020 for comparison with analytical results from 2014 (Evans and others, 2015). Results presented in both Evans and others (2015) and in McClesky and others (2020) did not indicate that geothermal-plant activities have unequivocally affected groundwater quality.

Scope of Work

Due to ongoing concerns related to geothermal energy production in the Puna area, continued monitoring of groundwater resources is needed. For this proposed study, water samples will be collected from 6 to 8 sites (contingent on access that will be facilitated by the County of Hawai'i), including available water-supply wells, with emphasis placed on collecting samples from previously sampled sites. Groundwater samples will also be collected from injection wells at the Puna Geothermal Venture (PGV) facility. Water samples will be analyzed onsite for field parameters (specific conductance, water temperature, dissolved oxygen, alkalinity, turbidity, and pH), and in USGS laboratories for major ions, trace elements, rare-earth elements, isopropanol, metals, pentane, pesticides, wastewater indicators, and water isotopes following standard USGS protocols. Blank and duplicate samples will be collected for quality-assurance purposes.

The first groundwater sampling effort (Phase 1) is anticipated to require six months and cost $195,000 (Table 1) for labor, travel, laboratory analytical expenses, and project support. Groundwater sampling and analytical methods will be consistent with those used in previous studies to enable meaningful comparisons and to build upon the existing record. The deliverables for Phase 1 will be a data release, a stakeholder and community presentation, and a non-interpretive fact sheet. The second groundwater sampling effort (Phase 2) will take about six months immediately following the completion of Phase 1 and will replicate sample sites and analytical methods. Phase 2 is anticipated to require a total of 6 months and $147,000 in project costs (Table 1). Deliverables for Phase 2 will be a data release, stakeholder and community presentation highlighting a comparison from previous efforts, and a non-interpretive fact sheet. The USGS is supportive of community engagement initiated by the County of Hawai'i, including participation from local community members, University of Hawai'i Hilo students, and other interested parties. The reduced budget for Phase 2 reflects cost reductions from labor and travel associated with out-of-state staff, establishing field stations, community awareness, and site familiarity during Phase 1.

Additionally, continuous monitors can be deployed in selected groundwater wells or near sites of groundwater discharge to collect data on water temperature, specific conductance (an indicator of salinity), and groundwater level. Data from these continuous monitors could provide an indication of effects from injection of geothermal fluids in the groundwater system. The associated costs will be dependent on the number of wells monitored (Table 4), with the total number of wells to be determined on the basis of mission objectives, availability of sites, and funding. Water-quality continuous monitors would require a site visit every two months to download data and maintain equipment. The USGS can potentially visit up to three sites during a one-day trip. However, if continuous monitors are deployed at more than three sites, then an overnight trip is required (Table 4). The annual cost to run a single continuous-monitor site would be $38,500 (Table 4), with cost increases for labor, equipment/supplies, and potentially travel as additional monitors are installed. While not reflected in Table 4, continuous monitoring site could be converted into near real-time monitoring site at an additional cost of roughly $10,000 per site for the initial installation.

Optional Scientific Investigation Report

As mentioned above, the results from Phases 1 and 2 will be documented in USGS data releases that will be publicly available online and will be presented to stakeholders and community members in a virtual format approximately 6 months after completion of each groundwater sampling effort. Upon completion of both groundwater sampling efforts, the USGS could also produce an interpretive report [USGS Scientific Investigation Report (SIR)]. The final report would provide an interpretive comparison of the historical record with Phase 1 and Phase 2 sampling results and presented in a stakeholder and community meeting. Producing an SIR will require an additional $86,000 (Table 1) and approximately 9 to 15 months to complete.

Planning for future years

Following the completion of Phases 1 and 2, the USGS would be capable of continued monitoring of groundwater resources with an estimated future monitoring base cost of $106,000 per groundwater sampling phase. For each year beyond the first, an annual incremental increase indexed to inflation (Table 3) will likely be required. Additional groundwater sampling phases, if deemed necessary by the County, would mirror previous phases, and could be modified based on the results of those phases.

Modifications may include adding or removing groundwater sampling sites, field parameters, and analytical constituents. With continuation of the program, the USGS could include community engagement through meeting attendance, inclusion of local organization volunteers, community presentations, and deliverables (data release / fact sheet). The estimated additional cost to include these deliverables would be $42,000 annually (with an annual increase due to inflation) through FY2025 (Table 3). Cost of deliverables are subject to adjustments based on stakeholder needs and concerns.

The USGS would also be capable of continuation of continuous well monitoring at selected groundwater sites with an estimated future monitoring base cost of $31,400 for one site, $56,700 for three sites, plus an additional $12,000 for every site over three that does not exceed 8 total sites. These cost figures are based on an estimated annual increase for inflation with the subtraction of initial sensors, and startup costs.

Table 1. Estimated Study Budget

Phase 1 Initial groundwater sampling effort	
Labor	$84,500
Travel	$25,900
Equipment/Supplies	$22,000
Sample Collection/Analysis	$45,700
Science Support	$16,900
Phase 1 Total	**$195,000**
Phase 2 Follow-up groundwater sampling effort	
Labor	$46,700
Travel	$17,300
Equipment/Supplies	$20,100
Sample Collection/Analysis	$50,700
Science Support	$12,200
Phase 2 Total	**$147,000**
Total Gross phase one + phase two	**$342,000**
Optional Interpretive Scientific Investigation Report (SIR)	
Labor	$53,000
Travel	$4,700
Science Support	$8,600
Publication	$9,700
Presentation	$10,000
SIR Total	**$86,000**
Total Gross Funds, with optional SIR	**$428,000**

Table 2. Project Timeline

TASK	START	END	M 1	M 2	M 3	M 4	M 5	M 6	M 7	M 8	M 9	M 10	M 11	M 12	M 13	M 14	M 15	M 16	M 17	M 18	M 19	M 27
Phase 1			**Phase 1**																			
GroundwaterSampling	Month-1	Month-1																				
Sampling Results/Reviews Approvals	Month-5	Month-6																				
Non-interpretive Presentation	Month-6	Month-7																				
Data Release Phase One	Month-7	Month-8																				
Phase 2			**Phase 2**																			
GroundwaterSampling	Month-6	Month-6																				
Sampling Results/Reviews Approvals	Month-10	Month-11																				
Non-interpretive Presentation	Month-11	Month-12																				
Data Release Phase Two	Month-12	Month-13																				
Optional Scientific Investigation Report			**SIR**																			
Publication	Month-17	Month-20																				

Table 3. Extension of Program (year 2+)

Additional Year (one sampling phase)	
Labor	$36,000
Travel	$6,300
Equipment/Supplies	$13,600
Sample Collection/Analysis	$44,000
Science Support	$6,100
Additional Year Total	**$106,000**
Optional Deliverables (Data Release & Fact Sheet)	
Labor	$22,000
Travel	$6,300
Science Support	$4,700
Publication	$6,800
Presentation	$3,700
Additional Year Total	**$43,500**
Total Additional Year	**$149,500**
Additional years may be indexed to inflation	
Additional year example	**$110,000**
Additional year optional deliverables example	**$43,500**
Total Additional Year's Estimated Cost	**$153,500**

Table 4. Addition of Continuous Monitor per Well Annually	
1 Continuous Monitoring Site	
Labor	$15,000
Travel	$9,200
Equipment/Supplies	$12,000
Science Support	$2,300
Total	**$38,500**
3 Continuous Monitoring sites	
Labor	$27,000
Travel	$9,200
Equipment/Supplies	$36,000
Science Support	$6,900
Total	**$79,100**
> 3 = < 8 Continuous Monitoring sites	
Addition Labor per Site	$6,000
Travel 2 Day Field Trips	$15,000
Additional Equipment/Supplies per Site	$12,000
Science Support	$1,700
Total per Site, Minus Travel (fixed rate)	**$19,700**
Additional years may be indexed to inflation	

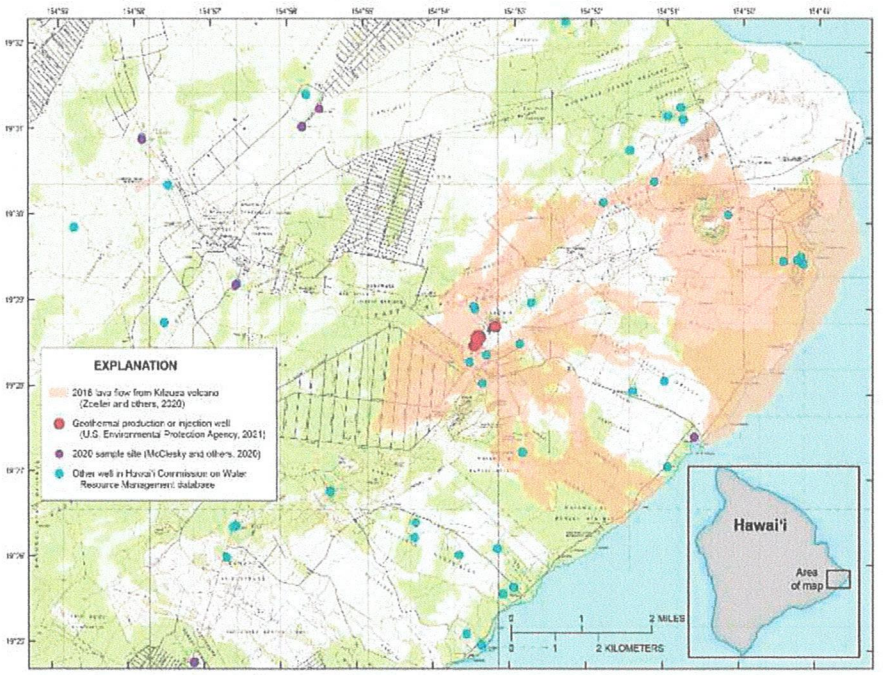

Figure 1. Map of the Puna area, selected wells, and 2018 lava flows from Kīlauea volcano, southeast Hawai'i.

References Cited

AP News, 2020, 3 lawsuits filed by opponents of Big Island geothermal plant: The Associated Press, November 2, 2020, accessed October 28, 2021, at https://apnews.com/article/environment-lawsuits-hawaii-hilo-kilauea-36091a0e2d9593a00268c7cd0049fedc.

Armstrong, J., 2018, Big Island—does anyone really miss the Puna geothermal plant?: Honolulu Civil Beat, July 13, 2018, accessed October 28, 2021, at https://www.civilbeat.org/2018/07/big-island-keeps-the-lights-on-without-lava-damaged-geothermal-plant/.

CNBC, 2018, Geothermal plant's wells are plugged as Hawaii's volcano sends lava nearby: CNBC, May 23, 2018, accessed October 28, 2021, at https://www.cnbc.com/2018/05/23/geothermal-plants-wells-are-plugged-as-hawaiis-volcano-sends-lava-nearby.html.

Evans, W.C., Bergfeld, D., Sutton, A.J., Lee, R.C., and Lorenson, T.D., 2015, Groundwater chemistry in the vicinity of the Puna Geothermal Venture power plant, Hawai'i, after two decades of production: U.S. Geological Survey Scientific Investigations Report 2015–5139, 26 p., accessed October 28, 2021, at https://doi.org/10.3133/sir20155139.

Iovenitti, J.L., 1990, Shallow ground water mapping in the lower east rift zone Kilauea volcano, Hawaii: Geothermal Resources Council Transactions, v. 14, part 1, p. 699–703, accessed October 28, 2021, at https://www.geothermal-library.org/index.php?mode=pubs&action=view&record=1001947.

Kristmannsdóttir, H. and Ármannsson, H., 2003. Environmental aspects of geothermal energy utilization. Geothermics, v. 32, no. 4–6, p.451–461, accessed October 28, 2021, at https://www.sciencedirect.com/science/article/pii/S037565050300052X.

McCleskey, R.B., Hurwitz, S., Younger, E.F., Roth, D.A., Johnson, M.O., and Elias, T., 2020, Groundwater chemistry in the Lower East Rift Zone and summit of Kīlauea Volcano, Hawai'i: U.S. Geological Survey data release, accessed October 28, 2021, at https://doi.org/10.5066/P9BVN915.

Perez, R., 2018, Puna Geothermal Venture faces challenges amid uncertainty: Star Advertiser, July 8, 2018, accessed October 28, 2021, at https://www.staradvertiser.com/2018/07/08/hawaii-news/geothermal-plant-faces-challenges-amid-uncertainty/.

Rybach, L., 2003. Geothermal energy-sustainability and the environment: Geothermics, v. 32, no. 4–6, p. 463–470, accessed October 28, 2021, at https://www.sciencedirect.com/science/article/pii/S0375650503000579.

Sorey, M.L., and Colvard, E.M., 1994, Potential effects of the Hawaii geothermal project on ground-water resources on the island of Hawaii: U.S. Geological Survey Water Resources Investigations Report 94–4028, 35 p., accessed October 28, 2021, at https://pubs.usgs.gov/wri/1994/4028/.

U.S. Environmental Protection Agency, 2020, Draft Class V underground injection control permit, permit number R9UIC-HI5-FY16-1R, Puna Geothermal Venture: Fact Sheet, updated, 8 p., accessed October 28, 2021, at https://www.epa.gov/sites/default/files/2020-09/documents/r9uic-hi5-fy16-1r-pgv-draft_uic_permit-factsheet-2020-08-31.pdf.

U.S. Environmental Protection Agency, 2021, Class V geothermal injection permit no. R9UIC-HI5-FY16-1R (the Permit), issued to Puna Geothermal Venture (PGV): Final permit, 33 p., accessed October 28, 2021, at https://www.epa.gov/system/files/documents/2021-09/r9uic-hi5-fy16-1r-puna-geothermal-venture-pgv-permit-2021-09-15.pdf.

Zoeller, M.H., Perroy, R.L., Wessels, R.L., Fisher, G.B., Robinson, J.E., Bard, J.A., Peters, J., Mosbrucker, A.R., and Parcheta, C.E., 2020, Geospatial database of the 2018 lower East Rift Zone eruption of Kilauea Volcano, Hawai'i: U.S. Geological Survey data release, accessed October 21, 2021, at https://doi.org/10.5066/P9S7UQKQ.

COUNTY OF HAWAI'I STATE OF HAWAI'I

RESOLUTION NO. 443 24

A RESOLUTION AUTHORIZING THE MAYOR TO ENTER INTO AN AGREEMENT WITH THE UNITED STATES GEOLOGICAL SURVEY FOR A WATER QUALITY STUDY OF THE LOWER PUNA REGION.

WHEREAS, the Planning Department wishes to enter into an agreement with the United States Geological Survey ("USGS"); and

WHEREAS, the agreement is to provide $428,000 to the USGS for the purpose of conducting a study of groundwater samples from the Lower Puna region; and

WHEREAS, the Geothermal Public Health Assessment, issued in September 2013, recommended robust, scientific study of the effects of geothermal energy production on drinking water and the near-ocean environment, and further recommended that the USGS undertake such work; and

WHEREAS, subsequent testing by the USGS in 2015 and 2020 of samples from deep geothermal wells, public-supply wells, and coastal springs did not provide sufficient evidence to unequivocally indicate adverse effects from geothermal energy production and related activities; and

WHEREAS, further and continuous monitoring and sampling of groundwater is necessary to facilitate fact-based and proactive stewardship of Hawai'i Island's precious water resources, to address ongoing environmental and health concerns or uncertainties related to geothermal energy production, to enable meaningful comparisons of relevant data across various timespans and locations, and to build upon the existing record of publicly accessible scientific information on this topic; and

WHEREAS, the proposed study involves two field collections from six to eight sites in Lower Puna, with a six-month interval between collections, laboratory testing of water samples, and subsequent analysis of results; and

WHEREAS, as part of the study, community members will be invited to accompany USGS field teams for the sample collection to foster observational learning, build local capacity in scientific processes, and ensure transparency, credibility, and community trust in the study's methodologies; and

WHEREAS, the results of this study will be published online and compared to historical data from previous sampling efforts in an interpretive report to be presented in a stakeholder and community meeting; and

WHEREAS, this study will help inform plans for regular water quality monitoring in future years; and

WHEREAS, under chapter 2, article 36, section 2-181(5), allowable expenditures of the Geothermal Relocation and Community Benefits Fund for public purposes include, but are not limited to, road improvements, water infrastructure, land acquisition, parks and recreational facility needs, civil defense, and mass transit improvements in Lower Puna; and

WHEREAS, Hawai'i Revised Statutes, section 46-7, requires the consent of the Council for County departments to enter into agreements with the federal government or any other public body or bodies respecting action to be taken pursuant to any of the powers granted to it by law and furnish, expend, and receive any funds or other assistance in connection with projects being or to be undertaken pursuant to the powers; now, therefore,

BE IT RESOLVED BY THE COUNCIL OF THE COUNTY OF HAWAI'I that, in accordance with Hawai'i Revised Statutes, section 46-7, this body does hereby consent to and duly authorize the Mayor of the County of Hawai'i to execute, on behalf of the County, an agreement and related documents with the United States Geological Survey for services as described hereinabove.

BE IT FURTHER RESOLVED that monies from the Geothermal Relocation and Community Benefits Fund are authorized to be expended by the Planning Department for the purposes described hereinabove.

BE IT FINALLY RESOLVED that the County Clerk shall forward a copy of this resolution to the Honorable Mitchell D. Roth, Mayor of the County of Hawai'i; Diane Nakagawa, Director of Finance; Zendo Kern, Planning Director; and Stephen J. Zahniser, Deputy Director of the Pacific Islands Water Science Center, United States Geological Survey.

Dated at Kona, Hawai'i, this 20th day of March, 2024.

INTRODUCED BY:

COUNCIL MEMBER, COUNTY OF HAWAI'I

COUNTY COUNCIL
County of Hawai'i
Hilo, Hawai'i

I hereby certify that the foregoing RESOLUTION was by the vote indicated to the right hereof adopted by the COUNCIL of the County of Hawai'i on March 20, 2024.

ATTEST:

COUNTY CLERK CHAIRPERSON & PRESIDING OFFICER

ROLL CALL VOTE

	AYES	NOES	ABS	EX
EVANS	X			
GALIMBA	X			
INABA	X			
KAGIWADA	X			
KĀNEALI'I-KLEINFELDER	X			
KIERKIEWICZ	X			
KIMBALL	X			
LEE LOY			X	
VILLEGAS	X			
	8	0	1	0

Reference: C-744/FC-147

RESOLUTION NO. 443 24

Ashley L. Kierkiewicz
Council Member
District 4 Puna

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Fax: (808) 961-8912
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HAWAI'I COUNTY COUNCIL

Hawai'i County Building
25 Aupuni Street • Hilo, Hawai'i 96720

February 7, 2024

Zendo Kern, Director of Planning
Via email: zendo.kern@hawaiicounty.gov

RE: Geothermal Community Benefit Fund

Aloha, Director Kern:

I am writing to formally request $428,000 from the Geothermal Relocation and Community Benefits Program, pursuant to Chapter 2, Article 36 of the Hawai'i County Code. This request aligns with a recommendation outlined in the Geothermal Public Health Assessment issued September 2013.

The purpose of this funding is to engage the U.S. Geological Survey (USGS) in conducting continuous sampling of groundwater resources and coastal ecosystems for geothermal indicators in Puna. This initiative would build upon previous sampling and analysis completed in 2015 and 2020.

Geothermal energy production in the Puna area has the potential to impact groundwater resources and coastal ecosystems, particularly through reinjection of geothermal fluids. It is not entirely clear where re-injected water may migrate.

Existing geothermal production wells in the Puna area generally are near a ground-surface altitude of about 600 to 800 feet and were drilled to depths of about 4,000 to 6,000 feet; in contrast, the nearby injection wells were drilled to depths of about 6,000 to 8,000 feet. Conditions of the injection permit addressing well construction, injection depths, monitoring, and operation procedures are designed to limit the potential for adverse effects on groundwater resources.

No groundwater contamination linked to geothermal activities is known to have occurred in Puna to date, although environmental and health concerns related to geothermal energy production exist. Heightened concerns arose after the 2018 eruption of Kīlauea volcano, temporarily closing the Puna Geothermal Venture (PGV) plant and covering three wells with lava.

Prior to the 2018 eruption of Kīlauea volcano, USGS collected water samples from deep geothermal wells, public-supply wells, and coastal springs to evaluate whether geothermal operations have affected groundwater quality. The samples were analyzed for major and minor chemical species, trace metals, stable isotopes of water, and two organic compounds used at the power plant as part of the heat-exchange process (pentane) or as an additive to control corrosion in the pipelines (isopropanol). Following the 2018 eruption of Kīlauea volcano, additional water samples were

collected during 2020 for comparison with analytical results. Results have not indicated that geothermal-plant activities have unequivocally affected groundwater quality.

To address ongoing concerns, further and continued monitoring of groundwater resources is needed. The proposed study involves collecting water samples from 6 to 8 sites, including available production wells and coastal springs, and emphasizing previously sampled locations. Water samples will be collected and analyzed in two phases to enable meaningful comparisons and to build upon the existing record. The study process includes community members accompanying USGS in field sampling to observe and learn, building local capacity in this scientific process and ensuring integrity of the sampling process. The process also includes robust community engagement and creation of a Scientific Investigation Report for the historical record.

Below is a breakdown, by phase and deliverable, of the $428,000 project cost:

Description	**Cost**
Phase 1 initial groundwater sampling *- Llabor, travel, equipment, supplies, sample collection, analysis, science support*	$195,000
Phase 2 follow-up groundwater sampling *- Labor, travel, equipment, supplies, sample collection, analysis, science support*	$342,000
Scientific Investigative Report *- Labor, travel, science support, publication, community presentation*	$86,000

Discussions with USGS have included plans for continuous well monitoring in future years. They recommend annual monitoring with a proposed budget of approximately $150,000, covering one sampling phase and a report (data release and fact sheet). Continuous well monitoring for a single site is $38,000, with three sites costing $79,100. Rather than including these in this initial request, our suggestion is to assess these items post-publication of the Scientific Investigative Report. We aim to establish a framework for sustaining this effort beyond the current Administration and Council Members.

If you have any questions or require more information please contact me on my cell or contact my Legislative Assistant, Ku'uhiapo Jeong, at 808-961-8265 or kuuhiapo.jeong@hawaiicounty.gov.

Mahalo nui for your kind consideration.

Cheers,

Ashley L. Kierkiewicz
Council Member, District IV

Note: A copy of the USGS proposal is attached.