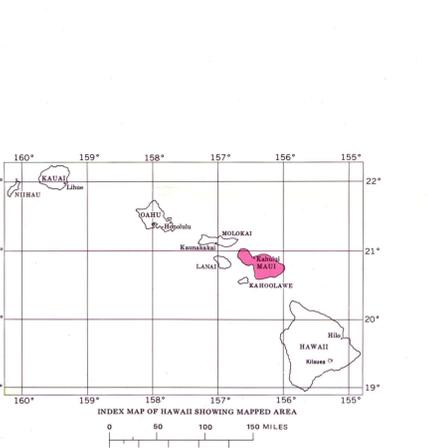


Base from U.S. Geological Survey Maui, United States, 1:250,000, 1966
SCALE 1:125,000
VERTICAL DATUM: MEAN SEA LEVEL, TRANSVERSE MERCATOR PROJECTION
HORIZONTAL DATUM: OLD HAWAIIAN DATUM
MAGNETIC DECLINATION FOR 1916 IS 11° EASTERLY FOR THE ENTIRE AREA

ISLAND OF MAUI SHOWING GEOHYDROLOGIC UNITS, SAMPLING SITES, AND GROUND-WATER SOURCES



Geohydrologic unit No.	Name	Topography and rock units	Ground Water Occurrence	Sources of pollution and recipient water bodies	Wells monitored b, c, CI	Candidate monitor wells
1A	Lahaina District (coastal)	Narrow sedimentary coastal alluvium and sandstone-filled valleys. Sediments are chiefly sand and gravel near the coast. Coastal flat narrow, and pinches out in northern part.	Principal occurrence is basal water in Maui lavas underlying the sediments. Water in the sediments occurs as basal water in the permeable zone. Basal water in the Maui lavas is the principal ground-water supply.	Where sediments are thin, ground water in the underlying aquifer moves directly to sea. Where sediments are thick and extend below sea level, water in the volcanic aquifer discharges into the sediments; thence to sea where the recipient is the ocean.	4597-01 CI monthly Flaming beach Maui wharf Olowalu shore b 2/month c 4/year Hale Ono beach Lahaina harbor Lahaina outfall Mahaanui beach Kaanani b 2/month	5200-04 S01-01 See well map for others. Need: Adequate non-tortoise water in sediments or coastal waters adjacent to seaward areas that discharge rapidly in heavy rain.
1B	Lahaina District (inland)	Eroded west slope of main volcanic dome. Central and southern parts are mostly underlain by Maui lavas. In the northern part, Maui lavas are capped by massive Honouliuli lavas. The Maui lavas are highly dike intruded in the upper mountainous areas.	Mainly as high-level dike-impounded water within the upper mountainous area and as basal water in areas bordering the dike-impounded water. Important sources of domestic and irrigation supplies.	Dike-impounded water discharges as springs in stream valleys or leaks through the dikes to the basal water body. Basal water discharges directly to sea or to overlying sediments; thence to sea where the recipient is the ocean.	At least 200 cesspools and 38 sewage-disposal wells. Chief recipient is basal water in principal volcanic aquifer.	5330-01, -02 S01-01 b, CI monthly 5340-02 S04-01 CI monthly 5637-05 S03-02 b monthly
2A	Maui area (eastern apron)	Extensive and thick sedimentary apron. Sediments are thickest along axis of major valleys. Deposits consist of alluvium and talus which are thinly veneered by fine sand in the isthmus area and in the coastal area.	Principal occurrence is basal water in the underlying Maui lavas. Water is basal in dike-free zones in permeable sedimentary zones in the upper part and basal in the lower part where permeable fill.	Water in sediments moves directly to sea. In permeable zones, the overflow tends to be basal water in the permeable zone. Water discharges directly to sea or to overlying sediments; thence to sea.	At least 450 cesspools and 3 sewage-disposal wells; also 15 pig-lagoon, and a solid-waste dump. Return irrigation water recipient is volcanic aquifer.	See well map. Numerous shallow wells in isthmus. Most wells are unsuitable because the water is not used too deeply.
2B	Maui area (inland)	Highly eroded east slope of main volcanic dome. Central portion underlain by Maui lavas. In the northern and southern parts, Maui lavas are capped by massive Honouliuli lavas. The Maui lavas are highly dike intruded in the upper mountainous areas.	Principal occurrence is dike-impounded water in stream valleys or leaks through the dikes to the basal water body. Basal water discharges directly to sea or to overlying sediments; thence to sea.	At least 50 cesspools. Chief recipient is basal water in the volcanic aquifer.	Iao Tunnel CI annually 5330-05, in geohydrologic unit 2A, fair. See well map for others. Need: None at present.	

Geohydrologic unit No.	Name	Topography and rock units	Ground Water Occurrence	Sources of pollution and recipient water bodies	Wells monitored b, c, CI	Candidate monitor wells
3	Isthmus area	Gently sloping isthmus connecting east and west Maui. Underlain mostly by Haleakala lavas and overlain by alluvium; these rocks are overlain by calcareous dunes which are 200 feet high near Kahului and diminish rapidly in height toward Kihui.	Basal water; mostly in alluvium near the north coast, some in sand. Elsewhere, main occurrence is in underlying Haleakala lavas which is principal irrigation supply. Sedimentary aquifer is utilized as recipient of wastes and flood waters in the Maui-Kahului area.	Recharge from both East and West Maui. Water in sediments near north coast moves freely into Kahului Bay; elsewhere water in sediments underlies irrigation water in Maui lavas to sea either directly or through overlying sediments.	At least 1,800 cesspools and 9 sewage-disposal wells. Also 16 flood-water and 2 canyons. Chief recipient is basal water in the sediments in the northern part and volcanic aquifer in the southern part.	5128-02 CI monthly 5320-01 b monthly c annually Hukilau Hotel beach Kahului break water Malama Harbor b 2/month Kas shoreline b 2/month
4	Northwest Haleakala	Northeast slope of Haleakala. Surface rocks are Maui lavas underlain by Honouliuli lavas. Area is mostly underlain by the heterogeneous nature of the Maui lavas. Water in sediments in the coastal zone is brackish. Basal water is important source of irrigation water.	Dike-impounded water likely exists at depth in rift zone. Main occurrence is basal water in the volcanic aquifer. In the northern part, basal water in the volcanic aquifer discharges into the sediments; thence to sea.	Overflow from dike-impounded and perch-water bodies in the rift zone. Basal water in the volcanic aquifer discharges into the sediments; thence to sea.	At least 1,200 cesspools and 5 sewage-disposal wells. Also 7 solid-waste and other landfills. 10 vehicle wash-down areas for chemical and herbicides. 15 holding ponds. Chief recipient is basal water in volcanic aquifer.	4727-01 S02-01 S03-04, -05 S03-01 S02-01, -02 S03-02 CI annually 4825-01 S02-01 S04-01 CI monthly 5420-01 CI annually Paia outfall b 2/month c 4/year
5	Northeast Haleakala	Northeast slope of Haleakala. Surface rocks are Maui lavas underlain by Honouliuli lavas. Area is mostly underlain by the heterogeneous nature of the Maui lavas. Water in sediments in the coastal zone is brackish. Basal water is important source of irrigation water.	Water is perched in the Hana, Kula, and Honouliuli lavas where it is perched and under artesian pressure in the Hana area and likely is basal water elsewhere. Some basal water in Hana lavas in the eastern part.	Overflow from perch-water bodies in the Hana and Kula lavas. In the Hana area, artesian perch-water moves from Honouliuli lavas to overlying Hana lavas. In eastern part, basal water in Hana lavas moves freely to sea.	At least 25 cesspools. No other significant sources of pollution.	None. Honouliuli Bay b 2/month c 4/year

Rock unit	Assemblage	General character	Water-bearing properties	Location in geohydrologic unit
Sedimentary material	Beach sand	Unconsolidated.	Highly permeable; carry brackish to saline water.	All units
	Younger alluvium	Unconsolidated.	Moderately to poorly permeable; carry some water.	All units
	Older alluvium	Consolidated.	Permeable; carry water near and at shallow depths below sea level ranging from near fresh to brackish.	Units 1, 2, 3, 4, 8
Rocks of Haleakala	Hana Volcanic Series	Chiefly lava flows, scattered cinders and ash.	Lavas highly permeable except for dense parts that filled canyons.	Units 4, 5, 6, 7, 8, 9
	Kula Volcanic Series	Chiefly lava flows, scattered cinders and tuff.	Lavas: Moderately to fairly permeable (thin zones). Carry small quantities of perch water. Tuff: Poorly permeable, acts as perching member.	Units 3, 4, 5, 6, 7, 8, 9
Rocks of West Maui	Honouliuli Volcanic Series	Chiefly lava flows, highly intruded in rift zones.	Highly permeable except in transitional lavas in upper zone. Mostly covered by younger lavas.	Units 4, 5 (not shown)
	Honouliuli Volcanic Series	Massive lava flows, scattered cinders.	Generally poorly permeable.	Units 1, 2
Rocks of West Maui	Maui Volcanic Series	Chiefly thin-bedded lava flows, highly dike intruded in rift zones.	Highly permeable and constitute principal aquifer in West Maui. Dike-impounded water matrix permeable streamflow.	Units 1, 2

Unit	Sedimentary material	West Maui rocks		Haleakala rocks	
		Honouliuli Volcanic Series	Maui Volcanic Series	Hana Volcanic Series	Honouliuli Volcanic Series
1A	Wells 5240-04, 5841-01, -02	None	Shafts 4835-01, 4837-01, 4937-01, 5240-01 to -03	Absent	Absent
1B	None	Well 5840-01	Wells 5237-01, -02, 5338-01, -02, 5339-01 to -04, 5337-03, 5340-01 to -05, 5337-01 to -05, 5638-01 to -02, 5639-01 to -02, 5638-01 to -02, 5640-01	Absent	Absent
2A	Wells 5429-01, 5629-02	None	Shafts 5340-01, -02, 5541-01, 5542-01, 5543-01, 5544-01, 5545-01, 5546-01, 5547-01, 5548-01, 5549-01, 5550-01, 5551-01, 5552-01, 5553-01, 5554-01, 5555-01, 5556-01, 5557-01, 5558-01, 5559-01, 5560-01, 5561-01, 5562-01, 5563-01, 5564-01, 5565-01, 5566-01, 5567-01, 5568-01, 5569-01, 5570-01, 5571-01, 5572-01, 5573-01, 5574-01, 5575-01, 5576-01, 5577-01, 5578-01, 5579-01, 5580-01, 5581-01, 5582-01, 5583-01, 5584-01, 5585-01, 5586-01, 5587-01, 5588-01, 5589-01, 5590-01, 5591-01, 5592-01, 5593-01, 5594-01, 5595-01, 5596-01, 5597-01, 5598-01, 5599-01, 5600-01, 5601-01, 5602-01, 5603-01, 5604-01, 5605-01, 5606-01, 5607-01, 5608-01, 5609-01, 5610-01, 5611-01, 5612-01, 5613-01, 5614-01, 5615-01, 5616-01, 5617-01, 5618-01, 5619-01, 5620-01, 5621-01, 5622-01, 5623-01, 5624-01, 5625-01, 5626-01, 5627-01, 5628-01, 5629-01, 5630-01, 5631-01, 5632-01, 5633-01, 5634-01, 5635-01, 5636-01, 5637-01, 5638-01, 5639-01, 5640-01, 5641-01, 5642-01, 5643-01, 5644-01, 5645-01, 5646-01, 5647-01, 5648-01, 5649-01, 5650-01, 5651-01, 5652-01, 5653-01, 5654-01, 5655-01, 5656-01, 5657-01, 5658-01, 5659-01, 5660-01, 5661-01, 5662-01, 5663-01, 5664-01, 5665-01, 5666-01, 5667-01, 5668-01, 5669-01, 5670-01, 5671-01, 5672-01, 5673-01, 5674-01, 5675-01, 5676-01, 5677-01, 5678-01, 5679-01, 5680-01, 5681-01, 5682-01, 5683-01, 5684-01, 5685-01, 5686-01, 5687-01, 5688-01, 5689-01, 5690-01, 5691-01, 5692-01, 5693-01, 5694-01, 5695-01, 5696-01, 5697-01, 5698-01, 5699-01, 5700-01, 5701-01, 5702-01, 5703-01, 5704-01, 5705-01, 5706-01, 5707-01, 5708-01, 5709-01, 5710-01, 5711-01, 5712-01, 5713-01, 5714-01, 5715-01, 5716-01, 5717-01, 5718-01, 5719-01, 5720-01, 5721-01, 5722-01, 5723-01, 5724-01, 5725-01, 5726-01, 5727-01, 5728-01, 5729-01, 5730-01, 5731-01, 5732-01, 5733-01, 5734-01, 5735-01, 5736-01, 5737-01, 5738-01, 5739-01, 5740-01, 5741-01, 5742-01, 5743-01, 5744-01, 5745-01, 5746-01, 5747-01, 5748-01, 5749-01, 5750-01, 5751-01, 5752-01, 5753-01, 5754-01, 5755-01, 5756-01, 5757-01, 5758-01, 5759-01, 5760-01, 5761-01, 5762-01, 5763-01, 5764-01, 5765-01, 5766-01, 5767-01, 5768-01, 5769-01, 5770-01, 5771-01, 5772-01, 5773-01, 5774-01, 5775-01, 5776-01, 5777-01, 5778-01, 5779-01, 5780-01, 5781-01, 5782-01, 5783-01, 5784-01, 5785-01, 5786-01, 5787-01, 5788-01, 5789-01, 5790-01, 5791-01, 5792-01, 5793-01, 5794-01, 5795-01, 5796-01, 5797-01, 5798-01, 5799-01, 5800-01, 5801-01, 5802-01, 5803-01, 5804-01, 5805-01, 5806-01, 5807-01, 5808-01, 5809-01, 5810-01, 5811-01, 5812-01, 5813-01, 5814-01, 5815-01, 5816-01, 5817-01, 5818-01, 5819-01, 5820-01, 5821-01, 5822-01, 5823-01, 5824-01, 5825-01, 5826-01, 5827-01, 5828-01, 5829-01, 5830-01, 5831-01, 5832-01, 5833-01, 5834-01, 5835-01, 5836-01, 5837-01, 5838-01, 5839-01, 5840-01, 5841-01, 5842-01, 5843-01, 5844-01, 5845-01, 5846-01, 5847-01, 5848-01, 5849-01, 5850-01, 5851-01, 5852-01, 5853-01, 5854-01, 5855-01, 5856-01, 5857-01, 5858-01, 5859-01, 5860-01, 5861-01, 5862-01, 5863-01, 5864-01, 5865-01, 5866-01, 5867-01, 5868-01, 5869-01, 5870-01, 5871-01, 5872-01, 5873-01, 5874-01, 5875-01, 5876-01, 5877-01, 5878-01, 5879-01, 5880-01, 5881-01, 5882-01, 5883-01, 5884-01, 5885-01, 5886-01, 5887-01, 5888-01, 5889-01, 5890-01, 5891-01, 5892-01, 5893-01, 5894-01, 5895-01, 5896-01, 5897-01, 5898-01, 5899-01, 5900-01, 5901-01, 5902-01, 5903-01, 5904-01, 5905-01, 5906-01, 5907-01, 5908-01, 5909-01, 5910-01, 5911-01, 5912-01, 5913-01, 5914-01, 5915-01, 5916-01, 5917-01, 5918-01, 5919-01, 5920-01, 5921-01, 5922-01, 5923-01, 5924-01, 5925-01, 5926-01, 5927-01, 5928-01, 5929-01, 5930-01, 5931-01, 5932-01, 5933-01, 5934-01, 5935-01, 5936-01, 5937-01, 5938-01, 5939-01, 5940-01, 5941-01, 5942-01, 5943-01, 5944-01, 5945-01, 5946-01, 5947-01, 5948-01, 5949-01, 5950-01, 5951-01, 5952-01, 5953-01, 5954-01, 5955-01, 5956-01, 5957-01, 5958-01, 5959-01, 5960-01, 5961-01, 5962-01, 5963-01, 5964-01, 5965-01, 5966-01, 5967-01, 5968-01, 5969-01, 5970-01, 5971-01, 5972-01, 5973-01, 5974-01, 5975-01, 5976-01, 5977-01, 5978-01, 5979-01, 5980-01, 5981-01, 5982-01, 5983-01, 5984-01, 5985-01, 5986-01, 5987-01, 5988-01, 5989-01, 5990-01, 5991-01, 5992-01, 5993-01, 5994-01, 5995-01, 5996-01, 5997-01, 5998-01, 5999-01, 6000-01	Absent	
2B	None	None	Wells 5124-01, -02, 5125-01, -02, 5126-01, -02, 5127-01, -02, 5128-01, -02, 5129-01, -02, 5130-01, -02, 5131-01, -02, 5132-01, -02, 5133-01, -02, 5134-01, -02, 5135-01, -02, 5136-01, -02, 5137-01, -02, 5138-01, -02, 5139-01, -02, 5140-01, -02, 5141-01, -02, 5142-01, -02, 5143-01, -02, 5144-01, -02, 5145-01, -02, 5146-01, -02, 5147-01, -02, 5148-01, -02, 5149-01, -02, 5150-01, -02, 5151-01, -02, 5152-01, -02, 5153-01, -02, 5154-01, -02, 5155-01, -02, 5156-01, -02, 5157-01, -02, 5158-01, -02, 5159-01, -02, 5160-01, -02, 5161-01, -02, 5162-01, -02, 5163-01, -02, 5164-01, -02, 5165-01, -02, 5166-01, -02, 5167-01, -02, 5168-01, -02, 5169-01, -02, 5170-01, -02, 5171-01, -02, 5172-01, -02, 5173-01, -02, 5174-01, -02, 5175-01, -02, 5176-01, -02, 5177-01, -02, 5178-01, -02, 5179-01, -02, 5180-01, -02, 5181-01, -02, 5182-01, -02, 5183-01, -02, 5184-01, -02, 5185-01, -02, 5186-01, -02, 5187-01, -02, 5188-01, -02, 5189-01, -02, 5190-01, -02, 5191-01, -02, 5192-01, -02, 5193-01, -02, 5194-01, -02, 5195-01, -02, 5196-01, -02, 5197-01, -02, 5198-01, -02, 5199-01, -02, 5200-01, -02, 5201-01, -02, 5202-01, -02, 5203-01, -02, 5204-01, -02, 5205-01, -02, 5206-01, -02, 5207-01, -02, 5208-01, -02, 5209-01, -02, 5210-01, -02, 5211-01, -02, 5212-01, -02, 5213-01, -02, 5214-01, -02, 5215-01, -02, 5216-01, -02, 5217-01, -02, 5218-01, -02, 5219-01, -02, 5220-01, -02, 5221-01, -02, 5222-01, -02, 5223-01, -02, 5224-01, -02, 5225-01, -02, 5226-01, -02, 5227-01, -02, 5228-01, -02, 5229-01, -02, 5230-01, -02, 5231-01, -02, 5232-01, -02, 5233-01, -02, 5234-01, -02, 5235-01, -02, 5236-01, -02, 5237-01, -02, 5238-01, -02, 5239-01, -02, 5240-01, -02, 5241-01, -02, 5242-01, -02, 5243-01, -02, 5244-01, -02, 5245-01, -02, 5246-01, -02, 5247-01, -02, 5248-01, -02, 5249-01, -02, 5250-01, -02, 5251-01, -02, 5252-01, -02, 5253-01, -02, 5254-01, -02, 5255-01, -02, 5256-01, -02, 5257-01, -02, 5258-01, -02, 5259-01, -02, 5260-01, -02, 5261-01, -02, 5262-01, -02, 5263-01, -02, 5264-01, -02, 5265-01, -02, 5266-01, -02, 5267-01, -02, 5268-01, -02, 5269-01, -02, 5270-01, -02, 5271-01, -02, 5272-01, -02, 5273-01, -02, 5274-01, -02, 5275-01, -02, 5276-01, -02, 5277-01, -02, 5278-01, -02, 5279-01, -02, 5280-01, -02, 5281-01, -02, 5282-01, -02, 5283-01, -02, 5284-01, -02, 5285-01, -02, 5286-01, -02, 5287-01, -02, 5288-01, -02, 5289-01, -02, 5290-01, -02, 5291-01, -02, 5292-01, -02, 5293-01, -02, 5294-01, -02, 5295-01, -02, 5296-01, -02, 5297-01, -02, 5298-01, -02, 5299-01, -02, 5300-01, -02, 5301-01, -02, 5302-01, -02, 5303-01, -02, 5304-01, -02, 5305-01, -02, 5306-01, -02, 5307-01, -02, 5308-01, -02, 5309-01, -02, 5310-01, -02, 5311-01, -02, 5312-01, -02, 5313-01, -02, 5314-01, -02, 5315-01, -02, 5316-01, -02, 5317-01, -02, 5318-01, -02, 5319-01, -02, 5320-01, -02, 5321-01, -02, 5322-01, -02, 5323-01, -02, 5324-01, -02, 5325-01, -02, 5326-01, -02, 5327-01, -02, 5328-01, -02, 5329-01, -02, 5330-01, -02, 5331-01, -02, 5332-01, -02, 5333-01, -02, 5334-01, -02, 5335-01, -02, 5336-01, -02, 5337-01, -02, 5338-01, -02, 5339-01, -02, 5340-01, -02, 5341-01, -02, 5342-01, -02, 5343-01, -02, 5344-01, -02, 5345-01, -02, 5346-01, -02, 5347-01, -02, 5348-01, -02, 5349-01, -02, 5350-01, -02, 5351-01, -02, 5352-01, -02, 5353-01, -02, 5354-01, -02, 5355-01, -02, 5356-01, -02, 5357-01, -02, 5358-01, -02, 5359-01, -02, 5360-01, -02, 5361-01, -02, 5362-01, -02, 5363-01, -02, 5364-01, -02, 5365-01, -02, 5366-01, -02, 5367-01, -02, 5368-01, -02, 5369-01, -02, 5370-01, -02, 5371-01, -02, 5372-01, -02, 5373-01, -02, 5374-01, -02, 5375-01, -02, 5376-01, -02, 5377-01, -02, 5378-01, -02, 5379-01, -02, 5380-01, -02, 5381-01, -02, 5382-01, -02, 5383-01, -02, 5384-01, -02, 5385-01, -02, 5386-01, -02, 5387-01, -02, 5388-01, -02, 5389-01, -02, 5390-01, -02, 5391-01, -02, 5392-01, -02, 5393-01, -02, 5394-01, -02, 5395-01, -02, 5396-01, -02, 5397-01, -02, 5398-01, -02, 5399-01, -02, 5400-01, -02, 5401-01, -02, 5402-01, -02, 5403-01, -02, 5404-01, -02, 5405-01, -02, 5406-01, -02, 5407-01, -02, 5408-01, -02, 5409-01, -02, 5410-01, -02, 5411-01, -02, 5412-01, -02, 5413-01, -02, 5414-01, -02, 5415-01, -02, 5416-01, -02, 5417-01, -02, 5418-01, -02, 5419-01, -02, 5420-01, -02, 5421-01, -02, 5422-01, -02, 5423-01, -02, 5424-01, -02, 5425-01, -02, 5426-01, -02, 5427-01, -02, 5428-01, -02, 5429-01, -02, 5430-01, -02, 5431-01, -02, 5432-01, -02,		