Sierra Club Moku Loa (Hawaii Island) Group
P.O. Box 1137 Hilo HI 96721

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Department of Health
1250 Punchbowl St
Honolulu HI 96813

RE: NPDES Stormwater runoff from TMT sites on Mauna Kea

My name is Deborah Ward, and I am chair of Hawaii Island Group of the Sierra Club, Hawaii Chapter. Mahalo for taking the time to hear our concerns about the **NPDES Permit (#HIS000431) for the "TMT Observatory Corporation".** We find that statements made in the permit application contradict the documents provided to the Department of Land and Natural Resources, and subsequently ruled on by the courts. We will briefly outline the contradictions, highlighting the facts taken from the University and TIO's own documents.

Unique Geology and Hydrology on Mauna Kea

On an ocean island two thousand miles from the next nearest land mass, fresh water is the source of life. Protection of the aquifer is tantamount to providing the generations to come with life-giving sustenance. The summit of Mauna Kea, the highest point in the Pacific, is the apex of the aquifers that radiate from the summit. The TMT EIS states that the regional aquifer beneath the summit of Mauna Kea is entirely fresh water. As evidenced by most seeps and springs, shallow groundwater does exist in the mountain's flanks below the summit area. Analysis of spring water shows it to be recent and identical to rainfall at the summit. At least some of the water percolates downward to ultimately discharge as a spring or seep. Drainage at the summit occurs through percolation of rainfall through cinder and broken rock substrates. *(TMT FEIS Section 3.7 Water Resources and Wastewater p 3-115, 117)* The EIS goes on to state that *"*Storms,

including wintertime cold-fronts, upper-level and surface low-pressure systems, tropical depressions, and hurricanes provide the majority of annual precipitation over a very short period of time." (*FEIS Vol. 1 at 3-183*) The Applicant's evidence also indicates that surface runoff at the summit does not extend below an elevation of 6,000 feet, which means that "the majority of the water ultimately ends up percolating and becoming groundwater recharge with only a small amount lost to evaporation." *(FEIS section 3.16 Cumulative Impacts p 3-219)*

The University of Hawaii and the Applicant, TMT, have not conducted any studies of the perched, contained high-level groundwater at the summit or the northern plateau. The United States Geological Survey document titled *Groundwater in Hawaii* states "The Island of Hawaii contains high water levels in the rift zones of Kilauea and Kohala Volcanoes. High water levels, possibly associated with a buried rift zone of Hualalai Volcano or fault scarps draped with lava flows, are also present along the western coast. Areas of high water levels also are found along the northern flank and eastern flanks of Mauna Kea and on the southeastern flank of Mauna Loa. These high water levels are not fully understood. *(USGS Groundwater is Hawaii p. 3)*

Although the amount of precipitation that infiltrates into the ground is unknown, it is generally accepted, and is reported by the NRCS (Sato et al. 1973), that surface infiltration rates in the summit region are high, and that during heavy precipitation events, water reaching the ground surface infiltrates quickly. The depth and rate of transmission of water that infiltrates is unknown and most likely varies depending on the rock type and the subsurface structure. *(From the DNLR approved Comprehensive Management Plan for Mauna Kea Section 5-32 (pdf p 82)*

As evidenced by modest springs and seeps, shallow groundwater does exist in the mountain's flanks below the summit area. The most prominent of these springs and seeps are the series of springs found near Pōhakuloa and Waikahalulu Gulches... This indicates that at least some of the rainfall and snow melt at the summit percolates downward to a perching layer to ultimately discharge at the ground surface as a spring or seep. *(TMT FEIS Vol I 3-117 (pdf p 205)*

Groundwater flowing downslope is the water source for seeps and streams found between 8,500 and 11,000 ft (2,591 and 3,353 m), near Pōhakuloa and Waikahalulu Gulches. There is evidence that the water discharging at the seeps and springs is derived from recent rainfall and snow melt across the upper slopes of Mauna Kea (Arvidson 2002; Ehlmann et al. 2005). *From the DNLR approved Comprehensive Management Plan for Mauna Kea Section 5-30 (pdf p 80*)

At the contested case hearing conducted prior to the TMT permit approval, the University's only witness, hydrologist Tom Nance, stated that regarding water on Mauna Kea:"Volcanic intrusives, or dikes, on Mauna Kea create compartments which are essentially impermeable, so when you get recharge (or runoff) it is deposited in dike-confined compartments. That's what we call the existence of high-level groundwater, and its relative impermeability of these intruded dikes that create high level groundwater." *Nance Tr.12.13.16 V16*. Nance stated that an aquifer is a groundwater body defined by boundaries, high-level or basal. How they fit together on this island he couldn't say. There are more aquifers than there are regulated aquifer systems. *Nance Tr.12.13.16 V16 p. 112:19-25, 113:1-2.* Three potable wells are tapped into high level dike-confined groundwater. *Nance Tr.12.13.16 V16 at 113:7-8.*

The Mauna Kea aquifer in the saddle of the island is a vast, recently confirmed body of fossil water. Recent studies of hydrology at Pohakuloa Training Area by University researcher Dr Don Thomas report that "Hydrologic conditions were strikingly different from those predicted by conventional models for ocean islands: the formation was dry down to only ~150 m where the first, thin, perched aquifer was encountered; a second, more substantial, perched aquifer was reached at only ~220 m depth that extended to ~360 m where a sequence of (remarkably thin) perching formations were recovered in the core down to about 420 m where unsaturated rocks were again encountered. Initial analysis of the core suggests that thin, clay-rich, perching formations in the shallow stratigraphic column play a much larger role in groundwater transport than has generally been recognized." *SAO Mauna Kea Aquifer studies on PTA p 2.*

Threats due to stormwater runoff

Threats to the hydrology of Mauna Kea include those associated with human presence and activity on the mountain and climate change. Human activities that have the potential to impact water resources quality, and to a lesser degree quantity, include any actions that add to the current wastewater volume or that change in-situ patterns of water movement. Examples are: leaking facility pipes; accidental spills of contaminants; and improperly filtered wastewater. These contributions may affect the quality of water seeped to springs along Mauna Kea's flanks, as well as the fresh water aquifers beneath the mountain. (*From the DNLR approved Comprehensive Management Plan for Mauna Kea Section NRMP, p. 2.1-38*.) The main activities that have potential to result in a release of contaminants include vehicle travel (on and off road) and accidents; release of hazardous material and petroleum product use by observatories and support operations; sewage generation; and transport of hazardous materials and sewage off-site. Transport of contaminants through the substrate has the potential to impact the quality of both surface water and groundwater. Direct toxic impacts on flora or fauna are also possible. The highest probability of impact [on surface water, groundwater, and flora or fauna] is from petroleum products (e.g., fuel for vehicles and backup generators, lubricants, and cleaning fluids) and human waste. (*From the DNLR approved Comprehensive Management Plan for Mauna Kea Section CMP, p. 6-14.)*

Spills of oil, sewage and hazardous chemicals have been repeatedly reported by researchers working at the summit, and they note that oil, in particular, will take a long time to biodegrade because of cold and dry conditions *(Howarth 2003). TMT FEIS Appendix K*

The TMT project, if built, would require the use, handling and storage of hazardous materials at Mauna Kea including: propylene glycol, acetone, methyl ethyl ketone, at least 2,000 gallons of diesel fuel, ethylene glycol, hydraulic fluid, liquid adhesives, coating metals, acids, paints, solvents, and other cleaning chemicals. (*From the DNLR approved Comprehensive Management Plan for Mauna Kea CMP FEIS Vol. 1, p. 3-129.)*

Will pollutants be directed to groundwater aquifers or streams?

That applicant's own documents and sworn witness make the claim that the TMT Observatory and a portion of the access road would create two acres of impervious surfaces that would cause runoff. Runoff would percolate into permeable natural ground. *Nance Tr.12.13.16 V16 p.98.* In its Conservation District Use Application, the applicant states that TMT facilities will be designed to maximize groundwater recharge to the extent possible. Site grading and landscaping will be designed to direct stormwater to pervious areas so that it may percolate into the ground and thus into the aquifer. *CDUA 6-1*. According to the FEIS, the TMT Project's design features will include the use of stormwater dry wells and grading to maximize groundwater recharge. The release of fuel or chemicals, including mirror washing wastewater, from an accidental spill, could degrade surface and groundwater resources. *FEIS Vol I 3-121 (pdf p 209).* The University's witness, Nance, stated under oath that runoff would move downward through the unsaturated lava, traversing vertically downward to underlying groundwater. We don't know the distance because we don't know exactly where the groundwater is. *Nance Tr.12.13.16 V16 p.99-100*. The runoff from the TMT site will go downslope to the North, following topography, on the northern flank of Mauna Kea. *Nance Tr.12.13.16 V16 p. 110*

How will polluted surface runoff affect communities and recreational users?

The Astronomy Precinct is located entirely above the Waimea Aquifer. (*From the DNLR approved Comprehensive Management Plan for Mauna Kea NRMP 2.1-38*)

On Hawai‘i, groundwater is the primary source of drinking water. In South Kohala, groundwater occurs as both basal groundwater and high-level (dike-impounded perched) groundwater. The Property is located within the West Mauna Kea Sector, Waimea Aquifer System (80301). Groundwater from this aquifer system is primarily pumped from the basal zone (where fresh

groundwater is suspended over seawater). However, the aquifer also includes high-level (or "dike- impounded") groundwater, which is impounded between dense, almost impermeable rock, or dikes, and is typically of excellent quality due to its inland location that prevents salt water intrusion. According to the Hawai'i Water Plan Water Resource Protection Plan (WRPP) (CWRM, 2008), the aquifer sector has a sustainable yield of approximately 24 million gallons per day (mgd) and use of 9.173 mgd (as of 2005), or approximately 38 percent of the sustainable yield.

The State Department of Land Natural Resources (DLNR) is in the process of updating the WRPP and CRWM staff released the WRPP 2019 Update Public Review Draft in October 2018. The 2019 Update Public Review Draft estimates the sustainable yield of West Mauna Kea Sector, Waimea Aquifer System (80301) at approximately 16 mgd (million gallons a day) and quantifies that current use has reached 13.83 mgd, or approximately 86.4 percent of the sustainable yield. *Nakahili Draft Environmental Assessment p. 34.*

Permit application is not available for review online or at Hawaii Island DOH Environmental Health Branch

- **Pre-construction conditions not met**
    - The TMT NPDES permit expired by its own terms on June 11, 2019. An administrative extension does not satisfy item GC3, which requires that TMT has "obtained a NPDES". The NPDES permit is going to public hearing on June 25, 2019 and was not renewed prior to the June 20th issuance of the Notice to Proceed.
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- **Due process violated**
    - Constitutional Law 101 tells us that due process means the right to be heard at a meaningful time in a meaningful way. We are deprived of participating in the NPDES permitting in a meaningful way and at a meaningful time because the Notice to Proceed was already issued -- last week. NPDES rules require review

every five years. The point and purpose of this rule is to require DOH to consider new evidence and circumstances, including the property rights of Hawaiian cultural practitioners, which could be vindicated in a contested case proceeding. The pre-issuance of the notice to proceed violated our rights to due process in the NPDES permitting process.

- **Out of date permit documents for public review**
  - Despite a statement on the Water Pollution Control (WPC) website stating that all NPDES documents can be viewed and downloaded, nothing related to the 2019 filings for permit HIS000431 are available. CWB stated that the servers are full and so they were unable to upload new documents. Nowhere is this or the remedy of submitting a government record request, stated on the WPC site. Comment deadline should be extended so that meaningful public access can be provided.
- **Reporting requirement loopholes**
  - It remains unclear whether or not TMT must file a new notice of start. It seems they may attempt to get around this requirement by identifying the start of construction as having been in 2014 -- and therefore the notice of start filed then as having fulfilled this requirement. We assert that a five-year hiatus, and certainly a lapsed permit, points to the need for a new notice of start to be filed within any potential 2019 start date.
- **No baseline assessment for water** quality for 4 of the 5 receiving waters
  - 4 of the 5 waters (Kemole Gulch, Kuupahaa Gulch, Puupohakuloa Gulch, Pohakuloa Gulch) are not listed in the 2013 or 2018 Water Quality Monitoring Assessment Reports. It is unclear how the Class 2 designation was assigned to these waters. How can we reasonably prove whether contamination is caused by storm runoff from the project without the completion of an assessment prior to the beginning of the project? There is a big hole here that allows TMT to claim a stream to have been degraded prior to the start of their project, and leaves us

with no information to counter that claim, rendering any attempt at enforcement of the permit impotent.

- **Remove construction wastewater**
  - Because baseline assessments have not been conducted of 4 of the 5 receiving waters and because the permit relies on self-reporting and enforcement by the applicant (TMT) it would be more appropriate to deny approval for stormwater discharge and instead require that all wastewater (including stormwater) be collected and treated off-site.
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- **No meaningful enforcement**
  - Because this permit is self-enforced, it means that the applicant (TMT) is supposed to report their own noncompliance! Because of the remote nature of the TMT site, it is not likely that other people (agencies or members of the public) are likely to come across potential violations -- particularly if the management rules, proposed by UH‘s Office of Mauna Kea Management are passed, which attempts to restrict access to Mauna Kea. Citizen enforcement, like in 2015 when protector Nancie Munroe discovered fluids leaking from construction equipment, is an important enforcement tool that is being impeded by the use of state police power and private security forces at Mauna Kea and specifically on the TMT site. Relying on an applicant to notify the agency of their own non-compliance is a weak and unrealistic expectation for meaningful enforcement of the permit.

Sierra Club calls for Contested Case Hearing.

Sierra Club members use the downslope streams and land areas for recreation, including hiking, camping, photography, tree-planting, birdwatching, and recreational enjoyment, and that use is separate and distinct from that of the general public. Sierra Club members also live above and drink from the waters of the Waimea Aquifer, which, according to the Applicant’s documents and sworn witness, will be impacted by polluted surface runoff from proposed activities

undertaken by the Thirty Meter Telescope during construction and implementation. Granting the TMT NPDES will impact the rights of Sierra Club members to a clean and healthy environment that are dependent on the quality of waters from the Mauna Kea aquifer and the streams that flow from surface runoff. We ask that you deny the permit and/or hold a contested case hearing to inform decisions on the permit prior to permitting consideration, and we cite HRS chap. 342D, HAR 11-1-22, and Haw. Const. art. I, sec. 5, art. XI, sec. 1 & 9, art. XII, sec. 7.

Sincerely,

Deborah Ward, Chair
Moku Loa (Hawaii Island) Group, Sierra Club