ETHIOPIA 2025 TRIP REPORT (NOVEMBER 1ST TO 14TH)

Water Engineers for the Americas and Africa (WEFTA) has been involved in water and sanitation projects in Ethiopia since 2019. In the West Omo Zone (WOZ) and Bench Sheko Zone (BSZ) of southwestern Ethiopia, WEFTA has partnered with Village Health Partnerships (VHP) to improve access to clean water and improved sanitation at six (6) health centers and three (3) hospitals, along with the regional teaching hospital in Mizan Teferi. Additionally, WEFTA has partnered with the Daughters of Charity International Project Services (DCIPS) to provide improved access to clean water at several schools within the capital, Addis Ababa, as well as in a few other cities throughout Ethiopia. In November 2025, two engineers with WEFTA, Marty Howell and Nathan Stormzand, traveled to Ethiopia with several members of VHP to conduct assessments of the water, sanitation, and hygiene (WASH) infrastructure at the health facilities and schools and to evaluate projects that had been completed since previous visits to these locations.

This trip report is divided into the following sections:

1. Project Team Roles and Responsibilities
2. Trip Summary.
3. Facility Assessments in the WOZ and BSZ.
4. 2025 WASH Assessment Results
5. Summary Tables for Proposed Improvements at WOZ/BSZ Healthcare Facilities
6. Recommended Next Steps and 2026 Follow-up at WOZ/BSZ Healthcare Facilities
7. Additional Facility Assessments in Maji and Addis Ababa

Note: All the spellings of the names of Ethiopian counterparts provided in this report are approximate and based on the best efforts of the authors. Moreover, typically only first names were used throughout the trip, so last names / surnames / father's names are only included if known. And, as with first names, the spelling is approximate. No disrespect to our Ethiopian counterparts is intended.

1. Project Team Roles and Responsibilities

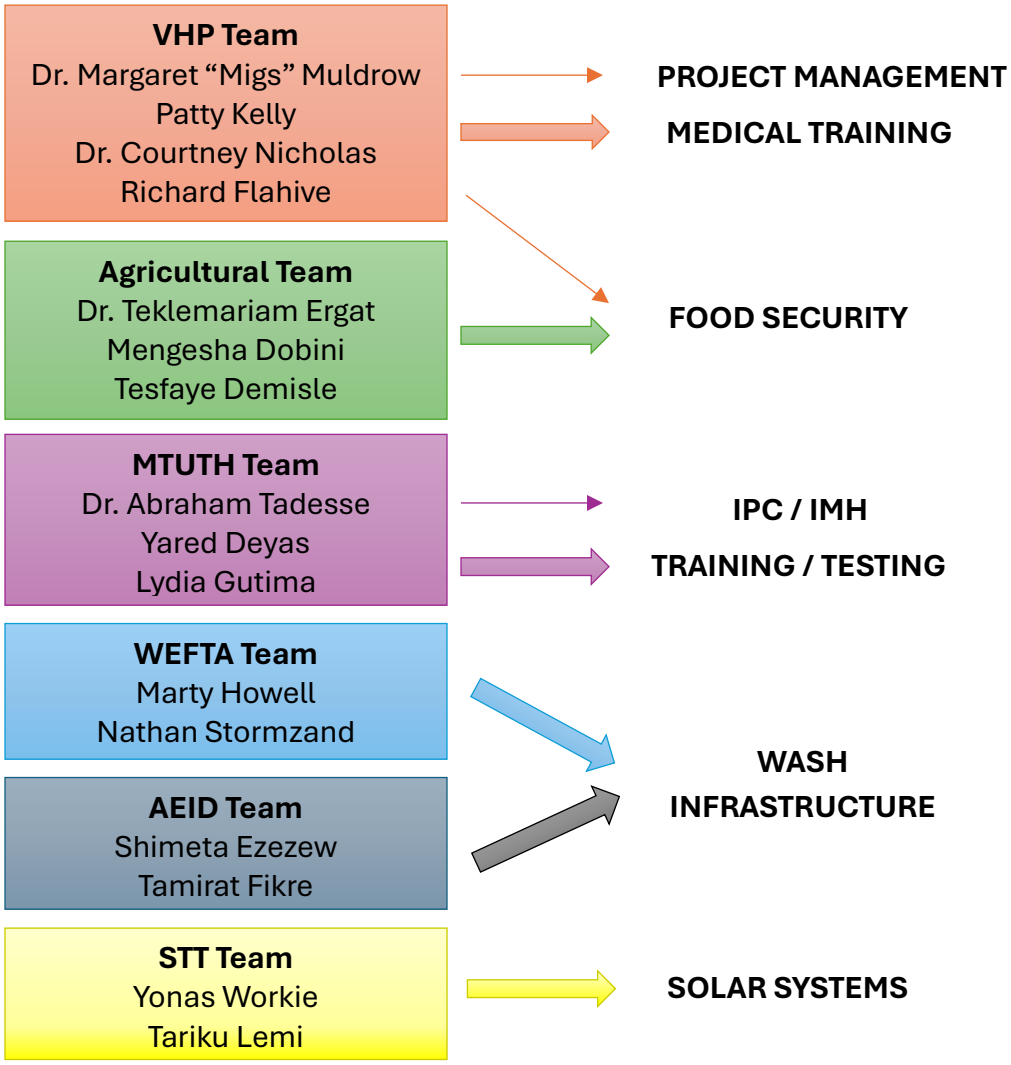
VHP has the goal of improving maternal health in the WOZ and BSZ through a four-pronged approach:

- Access to clean water, sanitation, hygiene, and solar power
- Proper infection prevention and control (IPC) practices along with infrastructure for maternal health

- Regular training and testing of midwifery skills
- Access to sufficient and nutritious food during and post-pregnancy

In order to achieve these goals, VHP has assembled a large and diverse group of expertise that perform different tasks throughout the year and assess progress during the annual site visits. See the organizational chart below for a breakdown of the roles and responsibilities. Please note that organizational chart below only includes those people who traveled with the project team in 2025. There are several other key individuals associated with the project that did not travel and are not included, though their contributions to the project are significant.

2025 VHP Project Team Organization Chart



Each of these teams had particular roles to fill during the 2025 trip to the WOZ and BSZ. Chiefly, WEFTA worked with SunTransfer Tech (STT) and Afro-Ethiopian Integrated Development (AEID) to check on new construction performed since the last trip in 2024 and perform assessments of the existing WASH and solar infrastructure at the health care facilities. Dr. Abraham Tadesse of Mizan Tepi University Teaching Hospital (MTUTH) completed the clean and safe health (CASH)

assessments that evaluate Infection Prevention and Control (IPC) practices and Infrastructure for Maternal Health (IMH); Yared Deyas, and Lydia Gutema conducted Nurse Mid-Wife (NWM) assessments that test midwifery knowledge and skills; Dr. Migs worked with Dr. Abraham and talked to expecting mothers in the Maternal Waiting Area (MWA); and the Agricultural team led by Roger and Dr. Teklemariam scouted locations for a MWA garden and talked to local stakeholders.

2. Trip Summary

Two representatives of WEFTA, Marty Howell and Nathan Stormzand, traveled from their homes to Washington, DC on October 31, 2025, where they met Dr. Margaret "Migs" Muldrow, Roger Flahive, Patty Kelly, and Dr. Courtney Nicholas of VHP. All six U.S. members of the team then traveled to Addis Ababa on November 1st and then on to Jimma on November 2nd. Upon landing in Jimma, the team was met by their drivers: Asaminew Debele, Taye, and Telegesu. After a quick lunch, the team then drove over 4 hours to Mizan Teferi to complete a continuous 32-hour travel odyssey. Shower and sleep were well deserved and needed.

On the morning of November 3rd, the team of Dr. Migs, Nathan, Marty, and Roger left Mizan in two vehicles driven by Asaminew and Taye for a meeting with the Zonal officials in Jomu, another drive of roughly 4 hours. They were joined in the Land Cruisers by Dr. Teklemariam Ergat from Addis Ababa and two representatives from the WOZ Department of Agriculture, Tesfaye Demisle and Mengesha Dobini. Patty, Dr. Courtney, and driver Telegesu stayed in Mizan Teferi as they spent the week teaching at the MTUTH and working in the hospital. Upon arriving in Jomu, the WEFTA/VHP team rendezvoused with remaining members of the team from AEID, Shimeta Ezezew and Tamirat Fikre, and MTUTH, Dr. Abraham Tadesse, Yared Deyas, and Lydia Gutima. After a quick meeting with Zonal Administration officials and a large lunch, the full team was back on the road. After another 2.5 hours, the team arrived in Maji where they had some coffee, a dinner with Maji hospital officials, and then settled into the Maji guest house for the evening.

Figure 1: Team at Entrance to Jomu (Left to Right: Tesfaye, Nathan, Mengesha, Roger, Dr. Taklimariam, Roger, Yared, Dr. Migs, and Dr. Abraham – Not pictured: Lydia, Shimeta, and Tamirat)

Work in earnest began on Tuesday, November 4th. The team drove the roughly 45 minutes down the mountain from Maji to Tum. A meeting was held at the Tum Health Center with Woreda Administration officials to discuss the purpose of the visit and ask for their cooperation and permission. After this meeting, the WEFTA team conducted the first of their WASH assessments (See Section 3.1 for results and discussion). Since this was the first, it was a bit chaotic to begin with, but the team and key stakeholders eventually settled into a rhythm and completed the work. After assessments were completed, a lunch with celebratory bread cutting and coffee ceremony was held. After this, the team proceeded back up the mountain to Maji where a WASH assessment was performed at the Maji Hospital (See Section 3.2). Solar assessments were not conducted at either Tum or Maji as the lead solar engineer, Yonas Workie with STT, was delayed in arriving due to a personal matter. After finishing at Maji Hospital, the team retired to the guest house for the evening.

Wednesday, November 5th arrived with a well-rested and refreshed team after everyone got at least 10 hours of sleep the previous evening. The team returned to Maji Hospital after breakfast to await the arrival of Yonas from STT to evaluate the various solar systems. Yonas was unfortunately again delayed, this time due to a flat tire outside of Tum, but did eventually make it there by mid-morning. The WASH team was then able to conclude their evaluation of the solar pump system as well as the full, separate solar system for the hospital. The team then swung by the Maji town well, which has a solar powered pump but is neither a WEFTA nor VHP project (See section X.X). After lunch, the team returned to Tum Health Center where they completed the solar portion of the WASH assessment. On the way back to Maji from Tum, the team stopped by the spring box which is the primary source of water for the town of Tum. When visited on previous trips, this had been a partially open structure that was a potential route for contamination to enter the system. However, in 2024, the spring box was rebuilt by the Government and is now fully sealed and has a rather impressive structure in terms of size. The team returned to the guest house for a quick shower before dinner in Maji with officials from the hospital, Woreda, and the mayor of Maji.

The team left Maji bright and early on Thursday, November 6th and headed to Kuju where they expected to find a newly constructed and functional water system. What they did not expect, however, was that there would be a massive celebration with hundreds of people in attendance to celebrate this new system. The team's convoy of Land Cruisers was stopped outside of town where they were greeted by town officials and then escorted through the community in a parade of honking vehicles and bicycles decked out with balloons. Upon arrival at the Kuju Health Center, the team was all given formal hats, coats, and scarves to wear and then escorted to a seating area where a group of Suri dancers performed for them. After a few minutes, the team was given coffee and a much belated breakfast and then the whole group plus several dozen celebrants headed down the hill to review the solar powered pump. Over the course of the next two hours, the WEFTA team did manage to sneak away from the crowds occasionally to complete their required WASH assessment (See Section 3.3) then it was back to the celebration for more dancing, speeches, and awarding of gifts. Around 2:30pm, the celebration finally broke up and the team along with many honored guests and officials headed to the nearby Gesha Coffee Village for lunch amid a brief but substantial downpour. Once lunch was concluded, everyone jumped into their vehicles and drove the roughly 2.5 hours to Jomu. The team arrived in Jomu just in time to check into the hotel before they were whisked away to a celebratory dinner put on by the Zonal officials. Around 8:30pm, the team completed the walk back to their hotel where they slept the sleep of the unbathed but well feted.

Figure 2: Local woman from Kuju filling the first water jug from a community tap stand.

Friday, November 7th was a relatively peaceful day compared to the previous but was still plenty eventful by any comparison to the average day back home. Dawn broke over our intrepid heroes eating a breakfast of eggs, rolls, and arguably too much coffee at a local restaurant. The team then headed amidst intermittent downpours to the village of Chiruharoot. This village is located about 1.5 hours' drive down a rough road off of the main thoroughfare between Jomu and Maji. The WEFTA team was in Asaminew' s Land Cruiser who, once again, proved himself a superior driver and more than capable of handling anything that Mother Nature can throw at him. The result was that the WEFTA team arrived at the Chiruharoot Health Center about 100 minutes before the rest of the team with the Zonal officials and had completed their WASH assessment before anyone else even arrived (See Section 3.4). As they had time, the WEFTA engineers headed down to the town pump which was reported to have broken more than a year past. There they found a group of contractors from the government initializing and testing a new pump that had just been installed to replace the broken one. Having a general interest but really no contribution to make to this effort, the team returned to the health center where they had a lunch and coffee ceremony. The team then headed back to Jomu and performed an assessment at the Jomu Health Center (See Section 3.5). After a quick stop off at the hotel to freshen up as best they could, the team then gathered to walk to dinner with the Jomu town officials. As it turns out, this dinner was actually in the hotel where they were staying, so the team only made it as far as the parking lot before turning around and heading back upstairs to dinner. After dinner, speeches, and presentation of gifts in the form of green coffee beans, the team retired for the evening.

Figure 3: Meeting and Coffee Ceremony after Assessment at the Jomu Health Center

The first break in routine after nearly a week occurred on Saturday, November 8th when, after driving roughly 40 minutes to, then breakfasting in Bachuma, the agricultural team of Roger, Dr. Taklimariam, Teshfeya, and Mengesha, along with driver Taye, left the group and headed back to Mizan Teferi. In Mizan, this team would transfer to Telegesu's car then drive to Jimma in order to fly to Rwanda the following day for two weeks of training. After saying their goodbyes, the rest of the team, including the two WEFTA engineers, got into the remaining Land Cruisers and drove an hour to the Chebera Health Center. Dr. Migs lived near Chebera as a child and so there was, not surprisingly, a large local contingent who came out to celebrate her return. Despite the large crowds and distractions, the WEFTA team managed to complete the WASH assessment with relative ease (See Section 3.6). Chebera is known to have very little water, even when compared to other communities which are not exactly water rich, so when the local authorities said that a borehole had recently been drilled and wanted the WEFTA engineers to look at it, they were eager to jump at the opportunity. The engineers did see the borehole and also checked on the possible route of pipelines and potential reservoir locations. Unfortunately, given the elevations and

distances involved, a community-scale water system is estimated to require an investment of over $500,000. As such, it is beyond WEFTA's current capabilities and would need to be constructed by Ethiopia's federal government. After another lunch and coffee ceremony, the team returned to Bachuma where they performed a WASH assessment at the Bachuma Hospital (See Section 3.7). As apparently a proper celebration for the Bachuma solar system was not held during last year's trip, a full celebration including speeches, gifts, and yet another lunch was held in the team's honor after the tours and assessments were completed. After a quick stop to say hello to Dr. Mig's Father's dear friend, the team returned to Mizan Teferi to reunite with Patty and Dr. Courtney and enjoy their first hot shower and non-traditional meal in nearly a week.

Sunday, November 9th was listed on the itinerary as a "day of rest" but apparently this was only intended to apply to the Land Cruisers' engines. The WEFTA team met with Dr. Migs all morning to discuss the findings from the past 6 days of assessments and create work plans for the forthcoming year (See tables in Section 5). After lunch, the WEFTA engineers met with Yonas to discuss potential solar projects at the various health facilities and request quotes. A big dinner was held that evening by Dr. Migs with all the extended team members and a large contingent of folks from MTUTH.

The final day of field assessments in the WOZ occurred on Monday, November 10th. The team traveled the 1.5 hours to Siz where they conducted a WASH assessment at the Siz Health Center (See Section 3.8) then moved to the nearby Siz Hospital. A new, full hospital solar power system was completed last month and so the hospital and community turned out for a full celebration. While not quite as large as that at Kuju, it made up for it in duration. Initiated with traditional dancing, over two hours of speeches and presentations culminated in the presentation of gifts followed by a large lunch. After lunch, the WEFTA team once again managed to sneak away to perform the WASH assessment (See Section 3.9) then enjoyed hanging out with celebration attendees while the rest of the work was completed. The full team was back in Mizan by 4:30pm where they caught up on work, ate a prolonged dinner, and packed.

Figure 4: STT Engineer Yonas Wordie (left) with WEFTA Engineers Nathan (middle) and Marty (right)

The team left Mizan Teferi and southwestern Ethiopia on Tuesday, November 11th. The two remaining Land Cruisers drove the five remaining US members of the team (Roger having left a few days previously) to the Jimma airport where they boarded a plane and headed to Addis Ababa. Once in Addis, the team said their goodbyes and parted ways. WEFTA engineer Marty Howell stayed in the airport and flew out later that evening. The VHP team members headed in a Land Cruiser to a local guest house to prepare for

meetings the following days with various officials. WEFTA engineer Nathan Stormzand took a shuttle to a hotel in the Bole area and communicated with Dr. Tilahun Azagegn, a professor of hydrogeology at Addis Ababa University and local WEFTA counterpart, to plan site visits for the following days.

On Wednesday, November 12th, Dr. Tilahun picked up Nathan after lunch then, after a brief stop at Addis Ababa University, they headed to St. Mary's Catholic School. However, due to a minor miscommunication, their contact, Sister Aster, was actually at St. Catherine's. They then drove the roughly 45 minutes in Addis traffic to St. Catherine's where they toured and evaluated the work that WEFTA helped facilitate at that location before having coffee, bread, and honey. The next day, Thursday, November 13th, Dr. Tilahun and Nathan traveled back to St. Mary's to review the water system there and perform a WASH assessment. After touring that facility, they walked with Sister Aster to nearby Lazarist School where they met with school officials to discuss their water system. WEFTA engineer Peter Fant visited Lazarist School during his trip to Ethiopia in spring of 2025 and more information can be found in that trip report.

Friday, November 14th marked the last day of the fall 2025 trip. After some brief sightseeing in the morning, WEFTA engineer Nathan met up with Yonas and Samson of STT / SEF for lunch and to discuss projects at the various healthcare facilities. He was joined once again by Dr. Migs and another VHP volunteer and Board Member, Laury Bowman, who had flown into Addis Ababa a few days earlier to meet with various government and non-governmental organization officials. The reunited WEFTA / VHP team then went to the Addis Hilton where they presented to and met briefly with the Addis Ababa Chapter of Rotary International. The team were then driven to the airport and headed home after an eventful and nonstop 12 days in country.

Figure 5: Children at St. Mary's Catholic School using the Hand Washing Station

3. Facility Assessments in the West Omo and Bench Sheko Zones

The following sections describe the issues encountered at the nine (9) health facilities assessed during the November 2025 trip. For each facility, the discussion is separated into the WASH-focused categories of water, solar power, and biohazard areas. Other WASH infrastructure at the facilities includes, but is not limited to, latrines, handwashing stations, water quality treatment, and wastewater control. However, these items are either present or absent at the facilities and typically don't require improvements or additional details outside of the WASH assessment results (See Section X.X).

The water at each facility was tested for a suite of 17 different analytes using a Varify® complete water test strip. Most analytes were non-detect and the few that did record a level above the detection limit of the strips were well within safe concentrations and not of a concern. Facilities that have a spring or other near-surface source of water were also tested for the presence of E. Coli and Total Coliform bacteria. The results of those tests are discussed below.

3.1. Tum Health Center

The Tum Health Center is located in the Maji Woreda and serves a catchment of 17,530 people. Previous project team infrastructure improvements at the health center includes the construction of a MWA; installation of a dedicated 10,000 L tank at the MWA that serves the shower and various tap stands; raising of the health center's 10,000 L tank to improve water delivery at the center; construction of a chicken coop; original connection to the town water system; construction of concrete pit latrines; and replacement of damaged solar panels for the center's solar power system.

Figure 6: Tum Health Center

3.1.1. Water

Water to the Tum Health Center is supplied by Tum's community system. The source of this water is a series of large springs located several miles above the town on the road to Maji. In 2024, the regional or federal government concluded a large water system improvement project that rebuilt the spring box, ran new distribution piping (where necessary), constructed a 100,000 L storage reservoir above the town marketplace, and constructed another 50,000 L storage reservoir at the administration buildings, immediately adjacent to the health center. At the time of the team's visit, the MWA and health center water distribution systems had been connected directly to a new supply line leading from the new 50,000 L reservoir, bypassing the two 10,000 L tanks onsite. It is believed that this was done as there is no mechanism to prevent the 10,000 L tanks from continuously overflowing if they were connected to the larger reservoir; shutoff float valves seemingly unavailable in the WOZ. These new connections are not necessarily an issue in and of themselves. However, the connections were incomplete as the

MWA shower, and MWA latrine handwashing station were not connected to the new supply line. Moreover, the supply line was sitting on the surface and had not been placed in a permanent trench. Woreda officials agreed to correct these issues and finished properly installing and connecting the new supply line. They also agreed to add a new tap stand for the future MWA garden behind the chicken coop and regrade and/or cut drainage channels to remove standing water around in the facility.

Figure 7: New 50,000 L Storage Reservoir next to Tum Health Center Constructed by the Government

The other main issue discovered with water is that very few of the rooms in the facility have any running water or proper drainage. The facility had been fully plumbed at one point but the internal plumbing is now in such a state of neglect and disrepair that only the laboratory had any consistent running water and most water comes from the sink located at the rear of the eastern building which also serves as the only handwashing station for the staff latrines. As is typical of the area, the health center has no facility staff with knowledge, skills, tools, or materials to implement any repairs. VHP has agreed to hire their local partner, Markos Geberesilassie, to fix a portion of the plumbing at the health center. Markos will assess the existing infrastructure and develop a workplan and Bill of Materials to restore water to the emergency room, labor, delivery, and recovery rooms. He will also make any repairs needed to the water supply in the laboratory and fix the broke laboratory drain pipe.

As the source of the Tum Health Center water is a spring, the water was tested for the presence of E. Coli and Total Coliform bacteria by collecting a sample in a whirlpack and incubating it for at least 36 hours. The Tum water source tested negative and is safe for drinking.

3.1.2. Solar Power

There are currently two separate solar systems installed at the Tum Health Center: one large system installed by the government to power the facility and one small system installed by SunDanzer that is directly connected to a medicine / vaccine refrigerator. Panels were damaged on the large, facility-wide system a year or two ago, so VHP hired STT to install new panels earlier in 2025. These panels are working well but are installed at ground level with no viable fence around them at the moment, so security is an issue. During discussions with health center staff, the team learned that even with the new panels, the batteries barely make it to 10pm or 11pm at night before they run out of charge. Yonas of STT explained that the existing batteries were quite old and that they would likely stop working completely and need replacement in the next 2-3 years. However, it was also determined that the health center is using a large, inefficient, standard residential refrigerator to store vaccines and medicines for the labor and delivery area rather than a highly efficient, specially designed refrigerator. WEFTA/STT recommended that while another solution is being prepared, that the facility remove the large refrigerator from the system and move items stored in that refrigerator to the smaller unit that is on the dedicated, direct supply solar system. This should prolong the

battery life by a substantial amount each evening to hopefully provide light in the event of nighttime labor. Based on the experiences at Tum Health Center as well as others in the WOZ, VHP, with strong agreement by WEFTA and STT, has decided to no longer try to repair the large, facility-wide systems at health centers. There are too many complicating factors with old systems and repairing these should be the responsibility of the local or zonal government. Instead, VHP will hire STT to install a small, dedicated solar system at Tum that will only supply light to labor, delivery, and recovery rooms as well as power a small, high-efficiency medical refrigerator for labor and delivery. This work may be done by or in cooperation with the nonprofit organization Stiftung Solarenergie – Solar Energy Foundation (SEF). The country director of SEF is Samson Lemma who is also Yonas's partner in STT and was responsible for installing similar systems at Kuju, Chiruharoot, Jomu, and Siz health clinics.

3.1.3. Biohazard Area

Biohazard areas at health centers and hospitals should consist of four key elements: a medical waste incinerator, for biological hazardous materials, a concrete lined and capped placenta pit, a standard burn pit for non-hazardous waste material, and a robust fence to keep people and animals out of the area, During the 2024 trip, it was noted that the incinerator at Tum Health System was partially broken and in a state of disrepair. Markos was hired by VHP to repair the incinerator at Tum and a few other health centers but, due to the original construction and the fact that it was full of burned sharps and hazardous material, these repairs could not be reasonably or safely executed. As the placenta pit at Tum Health Center is also nearly full, it was decided that VHP, with the guidance of WEFTA engineers, would hire Markos to demolish and bury the existing components and then build a completely new biohazard area at this facility. Once completed, the intent is that the Tum biohazard area will serve as the "model" for new biohazard areas to be constructed at two additional health centers, Kuju and Chiruharoot.

The burn pit, placenta pit, and fence are all standard and can be constructed using locally available materials using the means and methods that Markos determines will work best. The incinerator, however, requires some direction. After researching various options, the WEFTA team decided that "De Montfort"-style medical waste incinerator design (https://mw-incinerator.info/) modified to use locally available materials and construction techniques would be appropriate (See Figure XX). To safely handle and dispose of items such as metal sharps that may remain after the incineration process, a concrete chute will be constructed that connects the door to a nearby, dedicated, concrete-lined pit. With the chute, incinerator waste can be shoveled, swept, and/or pushed into the pit without requiring any human contact.

3.2. Maji Hospital

The Maji Hospital is located in the Maji Woreda and serves a catchment of 108,481 people. Previous project team infrastructure improvements at the hospital include the drilling of a 52 meter groundwater well; installation of an 5.5 kilowatt (kW) solar-powered submersible pump; construction of a MWA; installation of a dedicated 5,000 L tank at the MWA that serves the shower and tap stands. In addition, Carolyn Kurtz paid to install a large 33.6 kW solar power system for various critical rooms, units, and equipment in the hospital (See Section 6.1 for more information).

3.2.1. Water

Water is supplied to the hospital from the solar powered pump installed by the project team in 2022. From the well, water is pumped to two 25,000 L ground-level tanks, connected in

parallel, which serve as the primary storage for the facility. However, both of the tanks are cracked and leaking to the extent that one tank is completely unused and the other is only filled halfway. Thus, there is only around 12,000 L of active storage at the moment. As the potential pump output of 2.5 liters per second (lps) over the course of an 8-hour day far exceeds both the existing tank capacity and current hospital demand, the pump is manually turned on and off as water is needed. The two 25,000 L tanks feed a small, 2.0 horsepower transfer pump that lifts the water to an elevated tank located atop the adjacent concrete tower which pressurizes the distribution system. There is a red-handled gate valve located at the base of the tower that controls water supply to the 5,000 L storage tank at the MWA. According to interviews with staff, this valve is opened three times a week to fill the MWA tank. It was noted during the site assessment that this tank was installed at an elevation just above that of the nearby washing station and that those taps do not receive water when the tank is less than half full. The MWA showers were also noted to be in disrepair with risers falling off the wall and some leaky pipes.

Figure 8: Yonas of STT explain the controls of the solar pump at Maji Hospital

The existing distribution system for the hospital is reported to have severe leaking issues and, consequently, the only consistent point source of water is a tap stand located directly beneath the water tower connected to the transfer pump feeder line. During the 2024 site assessments, it was recommended by WEFTA engineers that a new water line be run from the tower to the building that houses the labor and delivery rooms to restore water to sinks in those critical rooms. Though water was running to this building during the site assessment, it appears that any investment from hospital or woreda or zonal officials was focused on correcting and updating indoor plumbing. The various sinks in the labor and delivery building looked clean and new but the external distribution piping that supplies that building was still visibly leaking. When asked, the hospital staff said that water is turned on in that building "as-needed."

The WEFTA and VHP team members had several conversations with the hospital administrators and officials from all levels of municipal, woreda, and zonal government. It was conveyed to these parties that a lot of investment had gone into the water system at Maji Hospital and that with some minor repairs combined with buy-in from leadership, that the hospital could have a complete, fully functional, and automated water system. The hospital also has no facility staff with knowledge, skills, tools, or materials to implement any repairs. The hospital therefore agreed to hire Markos to fix the leaky tanks and to assess and repair the leaks in the distribution system. WEFTA engineers believe the leaks in the tanks can be fixed using an epoxy, particularly one design to repair fiberglass. However, getting the correct product may require some coordination between WEFTA and local counterparts in Addis Ababa as it may not be

readily available in the region. VHP agreed to hire Markos to raise the MWA tank a few feet, correct the MWA showers and leaky pipes, and build a new tap stand for the MWA kitchen. Additionally, Markos will acquire and install a float valve on the MWA tank and float valves in each of the two 25,000 L tanks. These will allow the MWA tank to be filled automatically without the need to open and close the gate valve and allow for the pressure sensor in the pump to automatically turn the pump on and off, eliminating the need for manual operation.

3.2.2. Solar Power

The Maji Hospital has two solar systems: an 8.9 kW system for the pump installed by STT/SEF in 2022 and a 33.6 kW system for the hospital installed by STT in 2020. Because both of these systems were installed recently and are in good repair, no issues were discovered during this year's assessment besides the need for the panels to be cleaned regularly. Now that cellular and data coverage has expanded in the Maji area, VHP will have STT install a remote monitoring system similar to that already installed at the two other district hospitals so that system consumption, operations, error codes, etc., can be monitored from Addis Ababa. This will eliminate the need for frequent trips to the WOZ to check on the systems and also alert the STT engineers of any issues.

Figure 9: Battery Room for Maji Hospital Solar System

3.2.3. Biohazard Area

The biohazard area at Maji Hospital is in relatively good shape and there were no obvious issues that needed correction during the 2025 site assessment.

3.3. Kuju Health Center

The Kuju Health Center is located in the Gorigesha Woreda and serves a population of roughly 28,970 people. Previous project team infrastructure improvements at the health center include the drilling of a groundwater well; installation of an 19.6 kW solar system with submersible pump; construction of a water system for the health center consisting of supply and distribution lines, a 75,000 L reservoir with aeration tank; multiple health center tap stands and washing stands, three community tap stands and a cow trough served; the construction of a MWA; and installation of a small, 460W solar system for lights in the labor, delivery, and recovery rooms along with a high-efficiency medical refrigerator.

3.3.1. Water

When first visited by the WEFTA/VHP team, the health center along with the surrounding community had no convenient access to clean water. Water had to be collected from surface

water sources located far below the village and hauled up to the facility. Beginning in 2022, the project team began studying and planning for a water system. The well, which is located about 1.5 km away and 60 meters below the reservoir location was drilled in 2023. The WEFTA team worked with AEID to design the distribution system and VHP provided funding to construct those improvements in early 2025. After that, AEID continued with the construction of the water supply lines, tanks, tap stands, and other use points. When the 2025 site assessment was conducted, the system had just reached substantial completion and was still in its initiation phase. Water flowed from the reservoirs to the tap stands for the first time while WEFTA engineers were present and able to capture a photo of the event.

Figure 10: Project Team and Local Dignitaries in Traditional Ceremonial Dress in Front of the Kuju Solar Pump

As it is brand new and not even yet completed, there are no real issues with the water system that need to be addressed. Girma Genet, an AEID employee and the construction manager in Kuju, had a number of punch list items that needed completion before the project was done. This list included, but was not limited to, plastering the outside of the large reservoir tank, construction of the tank lid, construction of concrete boxes to protect the air relief valves, and fixing or replacing the internal plumbing and fixtures that had gone into disrepair during the years they were unused. WEFTA will task Markos with checking that these items have been completed when he travels to Kuju in 2026.

3.3.2. Solar Power

There are four solar systems in Kuju: a 2.5 kW system for the full health center installed by the German organization G.I.Z., a small triangular system that directly connects to a refrigerator used to store medication and vaccines installed by SunDanzer, a 460W solar system for 8 DC lights in the labor, delivery, and recovery rooms, one handheld light, along with a small, high-efficiency medical refrigerator installed by STT/SEF, and the 19.6 kW system for the pump also installed by STT. At the time of the assessment, the full facility system was not working due to a fault with the inverters that was originally installed beneath the solar panels. As mentioned above, VHP does not have the capacity to repair the full facility systems. Last year VHP installed a small solar system dedicated to labor and delivery with an associated solar refrigerator to hold critical medications for maternal health. However, STT took down the specifications of the inverter and is going to inform G.I.Z. of its failure. One issue that was noticed at all four facilities with the 460W dedicated labor and delivery systems is that people are standing on the batteries in order to reach the phone charging component of the system. A phone charger port was installed in these systems by STT to provide an easy solution and remove the possibility of people tampering with the system in order to charge their phones. WEFTA and VHP team members spoke with zonal administrators about this issue, and they agreed to support the clinic in either raising the batteries onto a table or constructing some type of protection for them. Markos is also going to check to ensure that this change has been implemented.

The only other current issue with the solar systems at Kuju is that the community is responsible for constructing a guard house and providing full time security at the solar pump. The pump is located far away from the community and without a guard is subject to potential theft and vandalism.

3.3.3. Biohazard Area

The current biohazard area at the Kuju Health Center is very poor and needs to be completely redone. VHP will hire Markos to demolish and bury all of the old, existing components and construct a new biohazard area based on the “model” area to be constructed in Tum (See Section X.X).

3.4. Chiruharoot Health Center

The Chiruharoot Health Center is located in the Me’enite Shasha Woreda and serves a population of roughly 26,027 people. Previous project team infrastructure improvements at the health center include the installation of a gravity flow water system for the health center that was connected to the town water system, construction of a MWA; installation of a 5,000 L dedicated tank for the MWA serving tap stands and showers; and installation of a small, 460W solar system for lights in the labor, delivery, and recovery rooms along with a high-efficiency medical refrigerator.

3.4.1. Water

The health center has historically been served by the Chiruharoot community water system which consists of a solar-powered pump that fills a hilltop reservoir and then flows via gravity to various tap stands and use points. During the 2024 assessment trip, it was noted that the health center no longer had any water supply and was hauling water from the nearby river using donkeys and jerry cans. The reason given was that a valve had either been closed or broken and this stopped water from flowing to the facility. When the WEFTA team arrived this year, water

had still not been restored and, to compound matters, one of the water-hauling donkeys had died. Upon questioning, health center administrators said that the facility did not have water because the community system was broken had been for over a year. WEFTA and STT engineers traveled to the community pump to evaluate the situation where they discovered contractors hired by either regional or federal government that were in the process of actively fixing the pump. The contractors indicated that the original solar pump had been undersized for the system and burned out after a few years of service. A new, larger pump was installed and in the process of testing during the site visit. The contractors were also expanding the community distribution system and anticipated that all work would be completed in the next 2-3 weeks. Thus, water service should be restored to the health center shortly.

Assuming that the repairs and improvements to the community system do result in water reaching the health center, there are a number of issues that need to be addressed. Mainly, the water system for the MWA has seemingly been either vandalized or cannibalized during the years without water. The inlet and outlet lines to the 5,000 L tank were cut and several sections missing along with many of the connections. Since the disconnections, a colony of bees has used the opening where the fill line used to be to build a hive. The size and extent of the bees was not determined during the site visit. Additionally, the washing station near the tank does not have any taps and the drainage is insufficient. According to several people, this is actually how AEID left the washing station at the end of construction. Zonal administrators agreed to repair the tank and connections so that the MWA will have water once service is restored. As the condition of the internal plumbing is unknown, VHP has agreed to hire Markos to assess the existing plumbing and make any repairs needed.

Figure 11: Disconnected Tank at the Chiruharoot MWA

3.4.2. Solar Power

There are three solar systems at the Chiruharoot Health Center: a 2.5 kW system for the full health center installed by the government, a small system of unknown wattage made from salvaged components that was installed by the government to run the laboratory and provide refrigeration, and a 460W solar system for 8 DC lights in the labor, delivery, and recovery rooms, one handheld light, along with a small, high-efficiency medical refrigerator installed by STT. The full center system is not working due to a broken inverter. STT took the inverter with them back to Addis Ababa to see if it could be easily repaired but that effort was not successful. As the panels, charge controller, and batteries for the larger system appear to be in good health and operational, it was suggested that the old inverter at Chebera that is no longer in use could be moved to Chiruharoot to repair that system. That is a recommendation that will be passed

along to the zonal administrators. As at other health centers, the batteries for the dedicated 460W system for labor and delivery are being stepped on so that people can access the phone charging port. WEFTA and VHP team members spoke with zonal administrators about this issue,and they agreed to support the clinic in either raising the batteries onto a table or constructing some type of protection for them. Markos is going to check to ensure that this change has been implemented. The system composed of salvaged parts that is providing power to the laboratory and larger refrigerator is likely not a long-term solution, but it currently functioning and is the responsibility of the health center and local officials to maintain.

3.4.3. Biohazard Area

The current biohazard area at the Chiruharoot Health Center is very poor, spread out, and needs to be completely redone. VHP will hire Markos to demolish and bury all of the old, existing components and construct a new biohazard area based on the "model" area to be constructed in Tum (See Section X.X).

3.5. Jomu Health Center

The Jomu Health Center is located in the Me'enite Shasha Woreda and serves a population of roughly 29,000 people. Previous project team infrastructure improvements at the health center include the connection of the facility to the town water system; the installation of a 10,000L water storage tank for the health center; the construction of a concrete pit latrine; construction of a MWA with kitchen and dedicated concrete pit latrines and showers with laundry stand and tap stand;; installation of a 10,000 L dedicated tank for the MWA serving tap stands and showers; installation of a small, 460W solar system for lights in the labor, delivery, and recovery rooms along with a high-efficiency medical refrigerator; and improvements to the existing biohazard area.

3.5.1. Water

Jomu Health Center is supplied by water from the Jomu community water system. The source of water for this system is a natural spring. Water from the spring is collected and pumped up to a reservoir that then distributes via gravity to tap stands and use points throughout the community. This system does not provide sufficient water for the community, which is why the MWA area at the health center has a 10,000 L tank to store excess water when supply is available. At the time of the visit, there was a small amount of water in the tank at the MWA but there did not appear to be any water within the health center itself. The health center could certainly benefit from a dedicated or additional water source or, at least, onsite storage that could store and supply water when the community system is lacking. There is also a new hospital under construction in Jomu that has no planned source of water at the moment. It is recommended that WEFTA engineers evaluate the water situation in Jomu during the next assessment trip and develop a plan for improving the water supply at the health center and providing water to the new hospital.

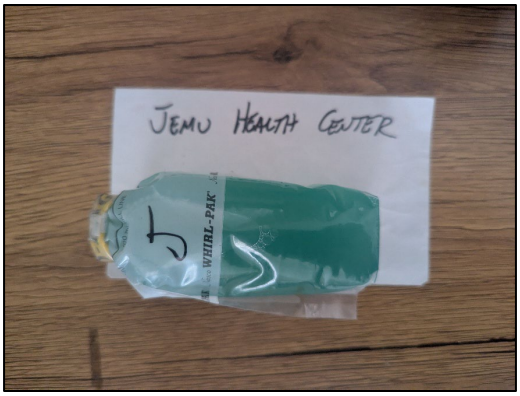


Figure 12: Blue-Green color of the Jomu water sample indicating the presence of E. Coli and Total Coliform

Though not visited during the 2025 trip, the spring source for the community system is known to not be fully closed and mostly unprotected. A water sample was taken from a tap stand located within the MWA for biological testing. After the appropriate incubation period, the sample was visibly blue/blue-green which means that it was positive for both E. Coli and Total Coliform bacteria. As there is no alternative source of water and few sustainable treatment options, it is recommended that the women in the Jomu Health Center MWA boil any water from the tap stands for a minimum of 3 minutes prior to consumption. This is admittedly a temporary solution, and a more sustainable, long-term solution should be developed by WEFTA, VHP, and in-country partners until the source of water can be improved.

3.5.2. Solar Power

The Jomu Health Center is connected to the electrical grid, though this power is best described as intermittent and regularly shut off or otherwise interrupted. To mitigate this, there are two solar systems at the health center: a small system of unknown wattage made from salvaged components that was installed by the government to run the laboratory and provide refrigeration, and a 460W solar system for 8 DC lights in the labor, delivery, and recovery rooms, one handheld light, along with a small, high-efficiency medical refrigerator installed by STT. The batteries for this 460W system are being stepped on so that people can access the phone charging port. WEFTA and VHP team members spoke with zonal administrators about this issue and they agreed to support the clinic in either raising the batteries onto a table or constructing some type of protection for them. Markos is going to check to ensure that this change has been implemented. The system composed of salvaged parts that is providing power to the laboratory and larger refrigerator is likely not a long-term solution, but it currently functioning and is the responsibility of the health center and local officials to maintain.

Figure 13: 460W System at Jomu with dirty batteries due to people stepping on them to reach the phone charging port. (Typical of all small systems at the health centers.)

3.5.3. Biohazard Area

Some minor improvements to the biohazard area, specifically to the incinerator, were previously completed by VHP via Markos. Though there are still a few deficiencies, mainly concerning the placement of the burn pit well outside the dedicated

biohazard area, they are relatively minor and will not be corrected by WEFTA or VHP this year. According to Dr. Migs, Médecins Sans Frontières (MSF / Doctors Without Borders) has started doing some work in Jomu and has plans to update the biohazard area. This progress will be monitored, and the biohazard area reassessed during the next trip.

3.6. Chebera Health Center

The Chebera Health Center is located in the Me'enite Goldia Woreda and serves a population of roughly 24,000 people. Previous project team infrastructure improvements at the health center include the construction of a MWA; installation and then repair of the rainwater collection pipes on the main health center building; construction of a rainwater collection system on the MWA building; installation of a 10,000 L dedicated tank for the MWA serving a tap stand; construction of a concrete pit latrine and shower for the MWA; and replacement of the charge controller, inverter, and batteries on the full clinic solar system.

3.6.1. Water

The community of Chebera and its health center have very little water and no currently viable way of developing an additional source. Within the health center compound, there is a roughly 6-meter-deep hand-dug well that at the time of the visit had about 2.5 meters of water in it, though it is reported that this source dries up during the arid months. A rainwater collection system on the primary medical center building that connects to a 30,000 L storage tank and serves a few tap stands was constructed back in 2020 by AEID. During last year's assessment, the piping associated with this collection system was broken so WEFTA hired Markos to repair it and also install a rainwater collection system on the roof of the MWA building that feeds to a 10,000 L storage tank. This work had all been satisfactorily completed and was functional during the 2025 visit. Both the storage tanks were at capacity, and each tank had a single tap stand that was connected to it. Additional tap stands at the main health center building and sinks inside the health center had previously been disconnected to limit water use and maximize the duration that the rainwater source would last. Once the collected rainwater is used and the hand-dug well is depleted, the health center has no water source except to haul from the distant river.

During the 2025 assessment, it was noted that there is an existing 5,000 L tank that is collecting a small amount of rainwater runoff in an inefficient manner from the eastern half of the east building of the health center, north of the MWA building. This tank appears to have been originally intended to collect rainwater for use at the MWA latrines and showers, but the piping had all been disconnected. WEFTA and VHP have agreed to hire Markos to create a new rainwater catchment system for this building similar to those he constructed and repaired at the other buildings last year. He will also repair, reconnect, and/or install piping and fixtures as

necessary to bring water to the MWA shower and construct a new handwashing station outside of the MWA latrines.

Figure 14: MWA at Chebera Health Center with Rainwater Catchment System

Figure 15: Blue-Green color of Chebera water samples indicating presence of E. Coli and Total Coliform

Water samples were taken from the tap stand located next to the primary health center rainwater storage tank and the hand-dug well for biological testing. After the appropriate incubation period, both samples were visibly blue/blue-green which means that they are positive for both E. Coli and Total Coliform bacteria. Though it was not tested, it is very likely that the water in the MWA storage tank also contains similar bacteria. As there are no alternative sources of water and few sustainable treatment options, it is recommended that the people at the health center and the women at the MWA boil any water from the tap stands for a minimum of 3 minutes prior to consumption. This is admittedly a temporary solution, and a more sustainable, long-term solution should be developed by WEFTA, VHP, and in-country partners.

3.6.2. Solar Power

There are two solar systems at Chebera Health Center: a 2.04kW full health center system originally installed by the government and repaired by STT, and a small triangular system that directly connects to a refrigerator used to store medication and vaccines installed by

SunDanzer. The original full health system failed a few years back. After some investigation and troubleshooting, VHP hired STT to install new batteries and a charge controller for this system, which was completed earlier this year. However, the original inverter turned out to be incompatible with the new charge controller which led to damage. Just before this year's site visit, the broken charge controller was replaced by STT with a new combination charge controller and inverter, which is now working correctly. The original inverter is still in good condition, however, so it was recommended that this inverter be moved to Chiruharoot to restore the system at that facility. This will require agreement from the heads of the health centers and coordination by the zonal officials.

During the assessment, it was noted that the new battery bank installed by STT are not as large as the original system and that they often run out of power during the night. The health center officials asked if additional storage could be added. Dr. Migs reminded everyone that VHP paid for the repair of the system and that the agreement was that power for labor and delivery would be prioritized. Though the health center officials verbally agreed to this again, there is not a lot of confidence among the project team that anything will sustainably change in practice. Because of this, VHP will hire STT to install a small, dedicated solar system at the Chebera Health Center that will supply light to labor, delivery, and recovery rooms only as well as power a small, high-efficiency medical refrigerator for labor and delivery.

3.6.3. Biohazard Area

The biohazard area at Chebera is in fairly good condition overall with an adequate fence, placenta pit, and recently completed burn pit. However, like many of the other facilities, the incinerator is old and in disrepair. VHP will hire Markos to demolish and bury the existing incinerator and construct a new medical waste incinerator based on the design used at the Tum Health Center.

3.7. Bachuma Hospital

The Bachuma Hospital is located in the Me'enite Goldita Woreda and serves a population of roughly 350,000 people. Previous project team infrastructure improvements at the health center include the construction of a MWA that includes buildings, latrines, showers, a kitchen, and tap stands; the installation of a 64kW full hospital solar system; the drilling of a well; and the installation of a submersible pump.

3.7.1. Water

The water system at the district hospital is straightforward but complicated. A 112 meter well was drilled in 2020 by AEID with a submersible pump that was installed later that year. This pump was connected to the town's grid but, given the unreliability and inconsistency of the power from that system, the pump's controller was quickly ruined. Because of this, hospital staff rewired the pump to bypass the controller's safety systems and be able to turn the pump on manually with the flip of a switch. After the hospital solar system was installed in 2024, the pump was switched over to solar power even though the full hospital system was not designed for this load. At the time of the site visit, the pump was still being turned on manually three times a week, on average. The pump fills two 25,000 L ground-level tanks that feed a 5,000 L elevated tank via a supply pump at the base of the tower. Water is then distributed to tap stands located throughout the hospital complex but there is no active indoor plumbing at this time, including in the labor and delivery rooms.

Though the water system is functioning at the moment, there is a strong concern amongst the WEFTA engineering team that the method of manual operations with hard starts and stops will burn out the pump motor sooner rather than would otherwise be anticipated. Additionally, during the assessment, the pump was started and the increase in load on the hospital solar system was measured to increase by over 12kW. While the solar system currently has this capacity, it was not sized for the pump load and may not be able to supply this consistently in the future when the hospital energy requirements are larger. The WEFTA team is therefore going to consider fundraising for a dedicated solar system with new submersible pump for the hospital.

Figure 16: Marty (WEFTA) and Dr. Migs (VHP) accepting a Certificate of Recognition from the Bachuma Town Administration for the Hospital Solar Project completed in 2024.

3.7.2. Solar Power

A 64kw solar system for the hospital was installed by STT in 2024. Though the purpose of this system is primarily to supply power to labor and delivery, emergency, and operating rooms, it is also lighting the full facility and supplying power to run the hospital's submersible water pump. Because this system was installed recently and is in good repair, no issues were discovered during this year's assessment besides the need for the panels to be cleaned regularly. STT installed a remote monitor component to the hospital solar system so this system can be monitored by STT personnel via a phone-based application from their office in Addis Ababa.

As discussed in the water subsection above, the WEFTA team is considering fundraising for a dedicated solar system for the submersible pump to remove this load from the hospital's solar system. Additionally, most of the hospital buildings' lighting has been replaced with LED lamps but there are a handful of buildings that still use old fluorescent bulbs. These should be replaced, if possible, to reduce loads on the solar system. As the hospital and/or local officials have replaced the majority of the lamps already, it is expected that they will be able to complete the transition to full LED. This is something that should be verified during the next assessment trip.

3.7.3. Biohazard Area

The Bachuma Hospital biohazard area is best described as mediocre trending towards inadequate. The large medical waste incinerator is still functioning but is starting to show signs of disrepair and likely does not have too many serviceable years left. There are two placenta pits though it is unclear which is being used and if either has a lot of space left. There are also two burn pits, though one is completely full, and the other was only partially completed and full of water at the time of the assessment. Finally, the entire area lacks proper fencing and

protection. No immediate improvements are recommended at this time, but the area should be thoroughly reassessed during the next assessment trip.

3.8. Siz Health Center

The Siz Health Center is located in the Shey Bench Woreda and serves a population of roughly 48,000 people. Previous project team infrastructure improvements at the health center include only the installation of a small, 460W solar system for lights in the labor, delivery, and recovery rooms along with a high-efficiency medical refrigerator.

The Siz Health Center has not been and continues to not be a priority for the WEFTA and VHP teams as it is in the same community as the Siz Hospital which has been a major focus for infrastructure improvements. VHP has strongly recommended to the town, woreda, and zonal officials that the health center be closed and all patients sent to the hospital. But, to date, the health center remains open and is responsible for a larger number of births than the nearby hospital. Consistent with this approach, the sections below discuss issues at the health center discovered during the site assessment but do not provide any recommendations for improvement.

3.8.1. Water

Historically, the health center has been connected to the community's water system which is supplied from a well and pump. However, at the time of the site assessment, there was no water at the Siz Health Center. The reason given is that the pedestal for one of the 10,000 L storage tanks had recently been rebuilt, and the water was shut off until the concrete was finished curing. There is a large storage tank on the community system visible from the health center a few hundred yards distant and it is believed that water was being hauled from a tap stand near that tank while the health center's system was offline. That being said, even when functioning, the health center's distribution system does not supply water to any connection points indoors, including the labor and delivery room for handwashing. The obvious reason for this is that the storage tanks onsite are set upon pedestals that are roughly equal to the floor elevation of the health center. Thus, there is insufficient head to deliver water indoors. As this was a well-known issue at the health center, it is unclear why they did not raise the elevation of the pedestal during its recent reconstruction. There is a second 10,000 L storage tank located to the rear of the hospital that was full of water during the time of the visit but did not appear to be supplying water to any access points. It was visibly connected to some pipes but, as with the other tank, does not have adequate elevation to supply water to the health centers' access points.

There is an old AfriDev hand pump located behind the health center atop a large concrete platform next to one of the 10,000 L storage tanks. However, due to either lack of shallow groundwater or broken components, the hand pump was not functioning at the time of the site visit. WEFTA has previously discussed moving the handpump from the Siz Health Center to the shallow hand-dug well at the Chebera Health Center since it is not being used in Siz. But, as these two health centers are located in different zones, this transfer would be logistically and politically difficult and is not being pursued at this time.

3.8.2. Solar Power

The health center is connected to the community's power grid for its primary power source. Due to the unreliability of the power grid, VHP and STT/SEF previously installed a small, 460W

solar system for lights in the labor, delivery, and recovery rooms along with a high-efficiency medical refrigerator. At the time of the assessment, this medical refrigerator was turned off and not in use. The hospital administrators said that it was because it was broken, though a quick look by STT determined that one of the buttons on the charge controller had simply been pressed by mistake. It was reiterated to hospital staff that the next time something like this happens, that they should call one of the two phone numbers written on the wall next to the charge controllers rather than just abandoning the refrigerator. As at other health centers, the batteries for the dedicated 460W system for labor and delivery are being stepped on so that people can access the phone charging port. WEFTA and VHP team members spoke with zonal administrators about this issue ,and they agreed to support the clinic in either raising the batteries onto a table or constructing some type of protection for them.

3.8.3. Biohazard Area

The current biohazard area at the Siz Health Center is very poor and needs to be completely redone. There is a medical waste incinerator that is in poor condition and does not appear to be used frequently. Unburned hazardous medical waste was observed in the burn pit at the time of the site visit.

3.9. Siz Hospital

The Siz Hospital is located in the Shey Bench Woreda and serves a population of roughly 218,000 people. Previous project team infrastructure improvements at the health center include the installation of a 58.9 kW full hospital solar system; the drilling of a well; and the installation of a submersible pump with a 16.5 kW dedicated solar system.

3.9.1. Water

The development of a water source for Siz Hospital has been a focus of WEFTA for the past few years. In 2023 a well was drilled by AEID, and a solar-powered submersible pump was installed in 2024. Given the abundance of water found during testing of the well, the submersible pump was oversized for the hospital system so that it could supply water to community tap stands also. Currently, water is pumped to two 10,000 L ground-level storage tanks and then via transfer pump to a 25,000 L elevated storage tank. This elevated tank supplies water to tap stands, handwashing stations, and sinks located both indoors and outdoors throughout the hospital complex. There are also a few local community tap stands just outside the hospital complex that are served by this tank.

During the 2024 site assessment, WEFTA engineers worked with community officials to map out and survey a potential larger community system that could be supplied from the hospital well. This system would include an elevated reservoir atop a nearby hill and several tap stands located throughout the surrounding community and was estimated to cost roughly $50,000 in 2024. A contribution to the cost of this system by the community was deemed a prerequisite for implementation of fundraising by WEFTA. As the focus for the past year was on the community contribution for the hospital solar system, no progress had been made on the water system. However, a large meeting was held at the end of this year's site visit, and the community promised a contribution of 1,000,000 Ethiopian Birr (approx. $6,500). Therefore, WEFTA plans to begin fundraising for the remaining cost of the community water system.

3.9.2. *Solar Power*

The Siz Hospital has two solar systems: one 16.5 kW system that powers the submersible pump and a new 58.9 kW system that supplies power to the hospital. Because both systems were installed recently and are in good repair, no issues were discovered during this year's assessment besides the need for the panels to be cleaned regularly. Also, during this site visit, STT completed installing the remote monitoring components to the hospital solar system, so this, like Bachuma Hospital, can now be monitored by STT personnel via a phone-based application from their office in Addis Ababa.

Figure 17: Siz Hospital Solar System Installed in 2025

3.9.3. *Biohazard Area*

The Siz Hospital biohazard area is in comparatively good condition. The medical waste incinerator and placenta pit appear adequate. The open burn pit is full, and a new pit needs to be dug, along with proper fencing installed to protect people and animals from various hazards. These improvements are to be implemented by hospital or local officials and should be reviewed during the next site assessment trip.

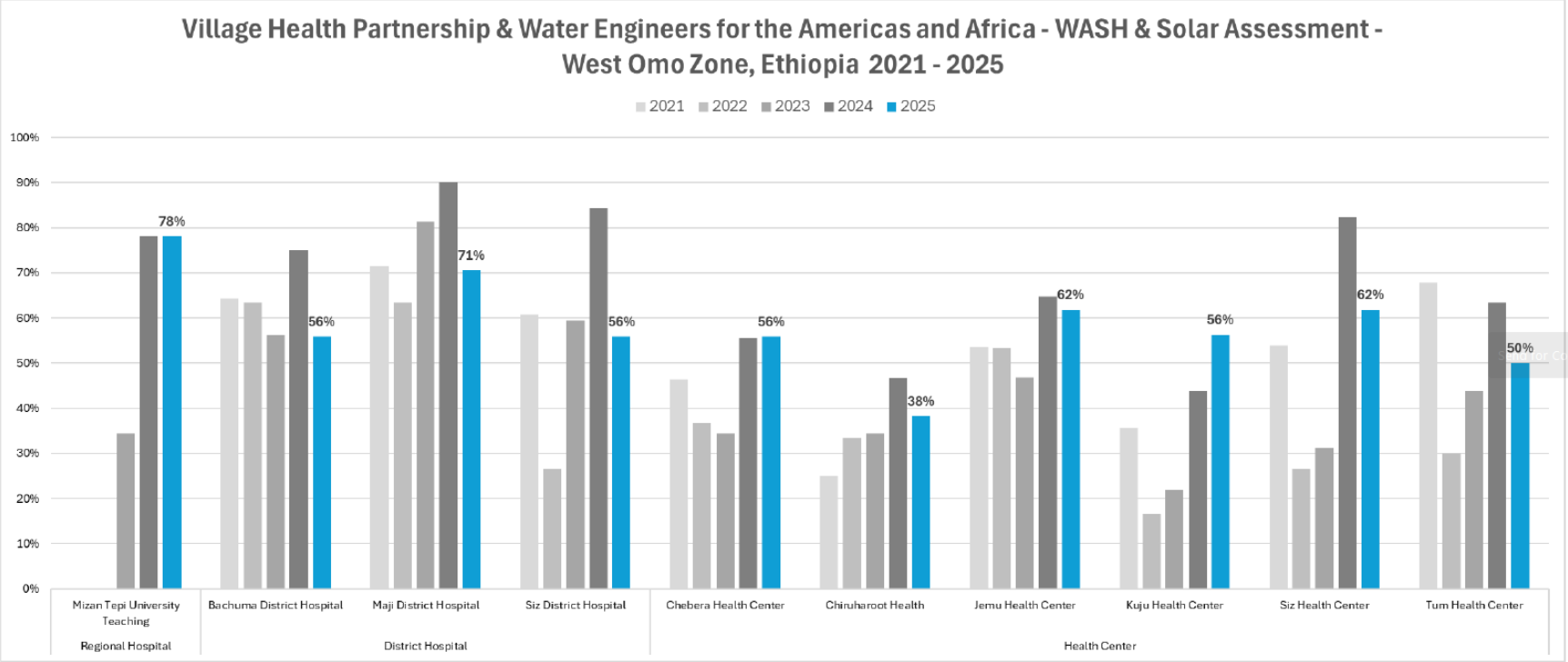
4. 2025 WASH Assessments Results

This year's trip marked the fifth consecutive year that the health facilities were evaluated using the 19-part WASH assessment form. This assessment form was developed by WEFTA in cooperation with VHP to be included as part of VHP's Safe Clean Tool Kit (SCTK along with the CASH and NMW assessments. Data was collected using the forms in Survey123 by ArcGIS and uploaded after the trip. Table 1 shows the WASH and solar assessment results for each healthcare facility for 2025 while bar graphs shows the scoring trends for the facility total score over time. The graphs show that the facility assessment scores are generally increasing over time, indicating improved access to clean water, sanitation, hygiene, and electricity. There are a few facilities where the scores dropped this year compared to 2024. In some cases this was due to an issue identified during the assessments, such as the lack of water supply at Chiruharoot or Siz health centers. In other cases, the perceived drop in the WASH assessment score is a consequence of recording fewer "N/A" results during the assessment process, which skews the adjusted percentage score downward. This occurs for both Maji and Siz district hospitals, where the absolute assessment score increased from 2024 to 2025, but the adjusted percentage score dropped.

Table 1: WOZ and BSZ Healthcare Facilities - WASH & Solar Assessment Results

Village Health Partnership & Water Engineers for the Americas and Africa - WASH & Solar Assessment - West Omo Zone, Ethiopia - November 2025										
Survey Date	10/14/2024	11/8/2025	11/4/2025	11/10/2025	11/8/2025	11/7/2025	11/7/2025	11/6/2025	11/10/2025	11/4/2025
Facility Name	Mizan Tepi University	Bachuma District	Maji District	Siz District Hospital	Chebera Health	Chiruharoot	Jemu Health	Kuju Health	Siz Health Center	Tum Health
Facility Level	Regional Hospital	District Hospital	District Hospital	District Hospital	Health Center	Health Center	Health Center	Health Center	Health Center	Health Center
Total Catchment Population	2,500,000	350,000	108,484	218,000	24,551	11,298	29,000	19,110	48,500	18,401
ASSESSMENT SCORING										
Compound	1	1	2	1	2	2	2	2	2	2
Drainage/Standing Water	2	2	2	1	2	2	1	2	2	0
Vector Control	2	1	2	0	1	1	0	1	0	0
Facility	2	2	2	1	2	2	2	1	2	1
Biohazard Area	2	0	2	1	2	1	2	0	1	1
Latrines	2	0	2	2	1	1	2	1	2	1
Handwashing Stations	2	1	0	2	1	0	2	1	1	0
Water Source	0	2	2	2	1	1	2	2	2	2
Water Quality	2	0	1	0	0	0	0	1	1	2
Facility Water Storage	2	2	1	2	2	0	2	2	2	2
Chlorine Production and/or Acquisition	0	1	2	1	1	1	1	2	1	2
Facility Water Treatment	0	0	0	0	0	0	0	0	1	0
Facility Wastewater System	2	1	2	1	0	0	0	2	0	1
Facility Power	2	2	2	2	2	1	2	N/A	2	2
Facility Solar	N/A	2	2	2	2	1	2	1	2	1
Facility O&M	2	1	0	1	0	0	1	0	0	0
Facility Tools and Equipment	2	1	0	0	0	0	0	0	0	0
TOTAL Assessment Score	25	19	24	19	19	13	21	18	21	17
Assessment Points Available	34	34	34	34	34	34	34	34	34	34
PERCENTAGE (Total Assessment Score/Assessment Points)	74%	56%	71%	56%	56%	38%	62%	53%	62%	50%
Adjusted Points Available (Assessment Points - N/A)	32	34	34	34	34	34	34	32	34	34
ADJUSTED PERCENTAGE SCORE (Total Assessment Score/Adjusted Points)	78%	56%	71%	56%	56%	38%	62%	56%	62%	50%

Figure 18: WASH and Solar Assessment Results (2021 to 2025)



5. Summary Tables for Proposed Improvements at WOZ/BSZ Healthcare Facilities

The following summary tables list the various problems or issues discovered at the facilities during the 2025 site assessments, proposed solutions, and parties responsible for implementing these solutions. These tables serve as the basis for request for proposals, request for quotes, and scopes of work for the coming year between WEFTA / VHP and their in-country partners, mainly Markos, STT, and AEID.

Summary of Water System Issues and Proposed Solutions

LOCATION	ISSUES	PROPOSED SOLUTION	RESPONSIBLE PARTY
Maji Hospital	1-Both 25k Liter tanks are cracked. 2- Distribution piping is broken and leaking. 3- Misc. leaks will arise when water is turned back on. 4- Big tanks need float valves for pump auto-shutoff. 5- MWA tank need float valve to auto-fill. 6- MWA fixes / improvements (raise 5k L tank, fix shower, fix leaks and sleeve shower pipe, add tap stand to kitchen area).	Epoxy to repair both tanks. Pipes should be easily fixed given materials and knowledge. Internal leaks are known unknowns. Float valves could be purchased in Mizan / Jimma. MWA issues are easily addressed given materials and knowledge.	Hospital / Town agreed to hire Markos to fix the tanks and repair the distribution piping. VHP agreed to hire Markos to do the remainder of the needed repairs and upgrades.
Tum Health Center	New water tank not fully hooked up to clinic system. New pipe needs to be placed in trench. Missing tap stand at garden. Clinic internal plumbing is broken. Drainage issues around compound.	New distribution pipe to be connected to existing laterals at MWA. New distribution pipe can be trenched in. Lateral to kitchen area can be extended to garden area. Clinic plumbing and drainage needs to be assessed first to understand the problems and budget fixes. Grading to remove standing water can be done with local tools.	Woreda to finish direction connections to MWA shower and trench in pipe.. Woreda to add tap stand. VHP/Markos to assess repairs needed to plumbing and drainage and implement repairs. Woreda to address compound drainage.
Kuju Health Center	Need to finalize / punch list new system. Indoor plumbing leaks due to the system coming online.	Final check on the system to ensure that everything has been completed.	Zone to check completion of the system. VHP/Markos to check on indoor plumbing.
Chiruharoot Health Center	No water from the community system. Distribution system status at health center is unknown. MWA piping has been hatcheted and needs repair. MWA 5k L tank is disconnected and infected with bees.	Community system being fixed. New pump to come online within two weeks.	VHP/Markos to assess plumbing at center and MWA repairs. VHP/Markos to repair facility plumbing and review Zone repairs of MWA area. Zone said it would move 10k L tank from Jomu to Chiruharoot to replace 5k L tank.
Jomu Health Center	No water in L&D but water at lab and MWA.	As-needed minor repairs.	VHP/Markos to assess plumbing at center and MWA repairs.
Chebera Health Center	Limited access to water. RWH system on east building nonfunctional.	Install new gutters, faces, and pipes to 5k L tank. Repair pipes around tank and run to MWA latrine / shower.	WEFTA/VHP/Markos to perform.
Bachuma Hospital	Current systems runs off Solar system and is turned on manually.	Plan for dedicated system.	VHP/STT to review
Siz Health Center	Currently no water at the center. The 10k L tank on pedestal and the front of the building was disconnected to allow for new pedestal curing, Even when online, neither this nor the 10k L tank on pedestal in the rear has sufficient head to supply water to the interior.	No outside action proposed. Woreda said that it would take the lead in implementing all fixes at the Health Center including on the water system.	Woreda to fix water system. WEFTA/VHP to assess next year.
Siz Hospital	Minor leaks in storage tanks and distribution lines.	No outside action proposed. Hospital/Woreda should address line fixes.	WEFTA/VHP to assess next year.

Summary of Solar System Problems or Issues and Proposed Solutions

LOCATION	# OF SYSTEMS	DESCRIPTION	PROBLEMS	ISSUES	PROPOSED SOLUTION	RESPONSIBLE PARTY	OTHER NOTES
Maji Hospital	2	1-33.6kW Full Hospital system installed by STT/CK. 2-8.9kW Solar pump system installed by STT/SEF.	None known.	None known.	STT to install remote monitoring for hospital solar. Clinic to clean panels regularly.		
Tum Health Center	2	1-2.5kW full clinic system installed by the Government. 2-Small triangular system for fridge installed by SunDanzer.	Old full clinic system only lasts for a few hours (10-11pm)		Large, standard fridge to be unplugged from the system and drugs / vac to be moved to other fridge. VHP to purchase small L&D system. Clinic to clean panels regularly.	VHP/STT for new system. Head of Clinic for refrigeration changes.	Batteries on old system will only last a few more years. Woreda to consider replacing batteries. Panels on old system were replaced by Samson last year. Main inverter is a Focus inverter (a bit different than other systems). DC only bulbs are a problem point as they can be removed and broken immediately. STT should install the batteries in a way so they can't be stood upon.
Kuju Health Center	4	1- 2.5kW Full clinic system installed by a German NGO GIZ. 2-19.6kW Solar pump system installed by VHP/STT. 3-460W L&D dedicated system installed by VHP/SEF/Green Lamp. 4-Small triangular system for fridge installed by SunDanzer	Old full clinic system is not working due to a broken inverter at panels.	People are standing on the batteries to gain access to reach the phone chargers.	Batteries to be placed atop a small table or otherwise protected. Clinic to clean panels regularly. Markos to check that battery raise occurred.	Clinic with support from Woreda/Zone	STT has taken photos of the broken inverter to check on cost / possibility of replacement. Zone would be responsible for replacing if possible / desired.
Chiruharoot Health Center	3	1-2.5kW full clinic system installed by the Government. 2-460W L&D dedicated system installed by VHP/SEF/Green Lamp. 3-Small system for laboratory created from salvaged components installed by unknown party.	Old full clinic system is not working due to a broken inverter.	People are standing on the batteries to gain access to reach the phone chargers.	STT has taken inverter and will attempt to repair in Addis. Batteries to be placed atop a small table or otherwise protected. Clinic to clean panels regularly Markos to check that battery raise occurred	STT and Zone for inverter. Clinic with support from the Woreda/Zone for the battery protection.	If inverter can't be fixed, could use the old inverter at Chebera which is no longer in use.
Jomu Health Center	2	1-Small L&D dedicated system installed by VHP/SEF/Green Lamp 2-Small system for laboratory created from salvaged components installed by unknown party.	None known.	People are standing on the batteries to gain access to reach the phone chargers.	Batteries to be placed atop a small table or otherwise protected. Clinic to clean panels regularly. Markos to check that battery raise occurred	Clinic with support from Woreda/Zone	
Chebera Health Center	2	1-Full Health Center 2.04kW system installed by Government and repaired by VHP/STT. 2-Small triangular rooftop system that runs second fridge installed by SunDanzer.	None at the moment.	New batteries installed by STT do not have as much capacity as old batteries and so do not meet all demands.	Clinic to prioritize L&D. Clinic to clean panels regularly.	Head of Clinic	May want to add new small L&D system to avoid overload and keep power to fridge.
Bachuma Hospital	1	1-Full Hospital 64kW system installed by VHP/STT	None known.	Few buildings do not yet have LED lights. Pump now attached to Solar which causes 12kW spike in usage. Pump could use dedicated system.	Clinic to clean panels regularly.	Head of Clinic	
Siz Hospital	2	1-Full Hospital 58.9kW system installed by VHP/STT. 2- 16.5kW Solar powered pump system installed by VHP/STT.	None known.	None known.	Clinic to clean panels regularly.	Head of Clinic	On-site generator is still being used to supply power to the Admin offices and the residences.
Siz Health Center	1	1- 460W L&D dedicated system installed by VHP/SEF/ Green Lamp	None known.	People are standing on the batteries to gain access to reach the phone chargers.	Batteries to be placed atop a small table or otherwise protected. Clinic to clean panels regularly.	Head of Clinic	The Solar fridge was not working or being used during the assessment. A button had been pressed on the charge controller that turned the fridge off. This was reset by STT.

Summary of Biohazard Area Issues and Proposed Solutions

LOCATION	ISSUES	PROPOSED SOLUTION	RESPONSIBLE PARTY
Siz Hospital	Burn pit is full.	New burn pit should be dug and fenced.	Hospital/Woreda
Siz Health Center	Incinerator is old and needs replacement. Incinerator does not appear to be used much. No burn pit present but a nearby burn pile contains biohazard material. Placenta pit is old and needs replacement,	None at this time.	Woreda said that it would take the lead to fix the Health Center. WEFTA/VHP to assess progress next year.
Bachuma Hospital	Incinerator is old and needs replacement. New burn pit needs to be finished.	Wait and assess.	N/A
Chebera Health Center	Incinerator is old and needs replacement.	Replace incinerator	WEFTA/VHP/Markos to build new
Jomu Health Center			MSF was going to address burn pit and fence
Chiruharoot Health Center	Biohazard area is in bad shape. Needs complete overhaul.	Complete new biohazard area and need to demo/bury everything else.	WEFTA/VHP/Markos to build new
Kuju Health Center	Biohazard area is in bad shape. Needs complete overhaul.	Complete new biohazard area and need to demo/bury everything else.	WEFTA/VHP/Markos to build new.
Tum Health Center	Incinerator is old and broken and can't be repaired. Need new placenta pit. Fencing is inadequate.	Biohazard area to be overhauled to create "model" area to be implemented here and at other health centers.	WEFTA/VHP/Markos to redesign and implement new incinerator, build new placenta pit, and upgrade living fence.
Maji Hospital	None noted. May need new biohazard area gate.	None needed at this time.	N/A

6. Additional Facility Assessments in Maji and Addis Ababa

A few additional facilities outside of the VHP program were visited by WEFTA engineers during the 2025 Ethiopia trip. These facilities are no less important or impactful, they just happen to not fit nicely within the bulk of the report presented above, so they are included here. The three facilities located in Addis Ababa were also visited by WEFTA Engineer Peter Fant in May 2025 and additional information can be found in that trip report:
https://www.wefta.net/wp-content/uploads/2025/05/2025-May-Ethiopia-and-Tanzania.pdf

6.1. Maji Town Pump *(Maji)*

In 2018, the town of Maji's pump, which was connected to an unreliable power grid and a diesel generator, stopped working. It was replaced with a new submersible pump by STT, funded by the U.S.-based NGO Maji Development Corporation that is active in the area and run by a friend of Dr. Migs, Caroline Kurtz. In 2019, the diesel generator stopped working and so decision was made to install a solar system to run the pump for the town. During the WEFTA/VHP team's visit to the Maji Hospital, they stopped by the town pump to do a quick assessment. Though several years old at this point, the pump and solar system and still running smoothly and providing drinking water to the community. At the time of the visit, the meter on the wellhead read 100,526 cubic meters (m^3) of water. Translated to imperial units, this means that since the replacement of the pump and installation of the solar panels, this system has provided more than 26.5 million gallons of clean water to the community.

Figure 19: Maji Town Pump Solar Panels

There were no big issues identified during the quick assessment though, like most systems, the panels are dirty and need to be cleaned. The project team spoke with a knowledgeable individual about the cleaning and also discussed it with the Maji town Mayor during dinner that evening. It was also noted that the vegetation needs to be trimmed beneath and between the panels before they start growing into the circuity or shading the panels.

6.2. St. Catherine's Seminary (Novitiate) *(Addis Ababa)*

A small St. Catherine's facility has been present in the Nifas Silk Lafto Sub-City of Addis Ababa for decades. Circa 2020, construction began on a large, new house with 28 bedrooms and a chapel that will serve as a retreat for church members as well as a novitiate for prospective nuns and housing for the elderly. In 2021, DCIPS requested help from WEFTA to develop a water project at St. Catherine's that would serve not only the house but also provide water to the surrounding community. In the intervening years, the project was scaled back to only supply water to the compound.

A new well was drilled to 142 meters and completed at St. Catherine's in March 2025. As it is near a heavily polluted river, the top 30 meters of the well were grouted to reduce the possibility of pulling contaminants from the surface water into well. WEFTA Engineer Peter Fant was onsite for pump testing in May 2025 that showed a sustainable pump rate of roughly 4 liters per second. Between May and November, a lot of progress has been made on the compound and the associated water system. At the time of Nathan's visit, only the final water tower atop the building was still under construction. It was estimated by the contractor that the concrete would be sufficiently cured to put the 6,000 L of rooftop storage in place within the month. The completion of the water system along with the installation of the elevator would mean substantial completion of the St. Catherine's house project.

Figure 20: Construction of Water Tower atop New Building

As the new well is highly beneficial to St. Catherine's, there is one major issue that could severely impact the function and longevity of the pumping system. The pump is currently hooked up to the city's power grid and is highly unreliable. According to Sister Aster, there is only enough power to operate the pump in the middle of the night when the nearby industrial shops are quiet. Currently, the pump is only turned on for a few hours 2-3 times a week to fill up the ground-level tanks. This is a workable solution at the moment but will not be sustainable once the housing project is complete and St. Catherine's starts receiving regular visitors. The sisters have asked DCIPS for funds to install solar panels on the east-facing roof of the old building to supply power to the pump, but they have not yet heard back regarding this request.

Figure 21: Potential Location of Solar Panels for the Pump

6.3. St. Mary's Catholic School *(Addis Ababa)*

St. Mary's is an all-girls school located in the Gulele neighborhood of northern Addis Ababa with over 1,800 K-12 students (U.S. equivalent), 70 teachers, and over 20 full-time residents. Due to water insecurity, in 2020-2021 WEFTA worked with Dr. Tilahun and DCIPS to help facilitate the construction of a 300-meter-deep well with submersible pump, ground-level storage tanks, treatment systems, elevated storage tanks, and nearly uncountable numbers of tap stands and handwashing stations. In 2024, a well rehabilitation effort overseen by Dr. Tilahun was conducted to due to corrosion and the buildup of iron sediment. According to the well meter, as of 2024, the pump has supplied 8163 m^3, or roughly 2.1 million gallons of clean water to the school.

Figure 22: Dr. Tilahun measuring the Depth to Water while Sister Aster watches closely.

A WASH assessment was conducted by Nathan during the site visit using the same survey questions and techniques performed for the healthcare facilities in the WOZ/BSZ. St. Mary's school scored a perfect 100% on the assessment! The facility is clean and well-maintained with a functioning treatment system and regular operations and maintenance. Water is piped from the well to ground-level storage tanks then up to an elevated tank then distributed either directly to use points or to numerous other tanks throughout the facility. Not a single leak was noticed during the site visit nor single broken component identified. The only item to note is that Dr. Tilahun thinks additional maintenance on the well will be needed within the next 1-2 years.

6.4. Lazarist Catholic School *(Addis Ababa)*

Lazarist Catholic School is a co-ed school very close to St. Mary's that has approximately 1,600 students and 130 faculty. Unfortunately, Lazarist School does not have the water security that is present now at St. Mary's. The school has an old well and pump that is estimated to supply water at roughly 0.35 lps, which means that it takes up to 8 hours to fill only a 10,000 L tank. When Peter visited Lazarist in May 2025, he talked with the Brothers and school officials about potentially helping facilitate a water project at the school. Dr. Tilahun was hired by WEFTA to study the hydrogeology of the area of Lazarist School and recommend solutions. This report was provided to WEFTA and Lazarist School in September 2025. It recommends the construction of a new borehole to a depth of 250 meters (+/- 15%) which is estimated to cost

Figure 23: Boys lining up to use the limited taps at Lazarist School

approximately $43,000. The total cost of the school system is not known at this time as additional assessments are needed to determine what existing infrastructure can be reused and what must be upgraded or replaced. At the very least, a new pump and an elevated water tank will be needed along with an increase in the number of tap stands and handwashing stations at the school. The next steps are for the Brothers to find a potential funding source for the project.