Assessment – Pre-Trip Plan

Executive Summary	
Community:	Los Churuneles II
Country:	Guatemala
Chapter:	Kansas City Professional Chapter
Submittal Date:	7/5/2019
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REIC and other mentors:	Scott Struck, PhD (REIC), Stephen Collins (professional mentor)
Scope of Work for the project (50 words) [1]	Design and implement modifications to an existing water supply system in a town of 300. Project potentially includes installation of water transmission piping, a water storage tank, water distribution piping and a water treatment system.
Scope of Work for the trip (100 words) [2]	This will be the first assessment trip where: 1) initial design concepts will be presented to the community for input, 2) final survey data will be collected and the project site investigated, this includes the sources intake site, the proposed storage tank location and community geography for distribution planning, 3) the chapter will meet with potential contractors and suppliers, and 4) land agreements will be discussed.
Proposed Next Step (100 words) [3]	After this trip, the Kansas City Professional Chapter will finalize the alternatives analysis and submit for approval. The project is tentatively slated for construction to begin in August 2020. There are proposed alternatives for each sub-scope of the project. See the potential solutions considered for more detailed alternatives information.
Describe Recent Contact with Community, NGO, and in country partners. (100 words) [4]	Primary contact is through the EWB-Guatemala office. We regularly schedule, send and receive messages via Whatsapp with EWB-Guatemala.
Describe the Chapters current fundraising goals and milestones. (100 words) [5]	The program is on track to fundraise for the implementation costs. The chapter has enough reserves to cover most of the project implementation costs. The chapter just held a trivia night fundraiser in May that exceeded expectations. In August the chapter's biggest annual fundraiser is expected to keep project fundraising goals on track.
☒ [6]	**IS THE PROGRAM STILL ON TRACK TO MEET THE EWB PROJECT EXPECTATIONS?**

Project Timeline [1]			
Major Milestone	**Previous Date [3]**	**Current Date [3]**	**Description**
Program Adoption Date	2/26/2019		
Project Approval Date	5/2/2019		
Planned Assessment Trip	Not Previously Planned	8/17/2019	Trip to complete data collection and to form relationships with community, contractors, and suppliers.
Planned Implementation Trip	Not Previously Planned	8/15/2020	Trip to construct water supply infrastructure
Planned M&E Trip	Not Previously Planned	2/13/2021	Trip to monitor the system performance and conduct minor repairs.

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1.0 Project Description

1.1 Project Background and History

The program in Guatemala was opened in early 2019. The first project in Los Churuneles II kicked off in the second quarter of 2019, and the project team will travel to the community in August 2019 for the first assessment trip. Since the inception of this project, partnerships have been formed with the EWB-Guatemala office and its constituents. During the assessment trip the team will work to form relationships with the leaders of Los Churuneles II and its community organizations including the Community Development Council, COCODE.

1.2 Project Context

Los Churuneles II is a small, conservative, and rural community in southwestern Guatemala with a population of approximately 300 people. Traditionally, men are involved in agriculture farming of corn and beans, and women weave and make clothes. However, need for and training in skilled labor in surrounding towns is a growing demographic and some people leave the community to work elsewhere. The community has a significant need to overhaul and replace the current water system for it's failure to meet the demands of the people. The existing water infrastructure is supplied solely by the local spring through a series of limited distribution channels, which are estimated to be 25 years old. The spring box supplies water to two other local communities, which may contribute to the water shortage in the Los Churuneles II community. The 75% of the community that is connected to the distribution network receives spring water at 9.5 gpm.

It is the goal of the Kansas City Professional Chapter to support this community with its immediate water storage, distribution, and treatment needs. Specifically, the project team will assess the benefits and community desire for a new storage tank on the purchased land along with an improved distribution system. Through a new piping network, storage tank, and treatment system, potable water may be supplied to the community to meet domestic needs.

1.3 Project Goals and Objective

The trip objectives include the following:

1. Establish communication between the community, partners, and EWB.
2. Learn more about the community through questionnaires and interviews.

3. Establish if a water quality testing program is necessary and feasible.
4. Investigate and gather data on the existing water and electric infrastructure.
5. Determine modifications needed and scope of project.

The primary goal of this trip across all disciplines is to establish a partnership and open lines of communication between all project stakeholders including the community, NGOs, EWB-Guatemala office, and the EWB-KC chapter. Introductions will take place during the first days that the team is in the country and a concluding meeting will take place towards the end of the assessment trip. During these meetings EWB-KC will help to determine everyone's roles and responsibilities. Regular communication will be established at an agreed upon interval.

Interviews and questionnaires will be used to gain more insight into the day-to-day lives of community members and the history of the region. The proposed questionnaire is attached to this document. All responses will be documented.

Ideally, the community should have access to a water source that is both plentiful and high quality. The project team will investigate the necessity and feasibility of a water quality testing program. The goal of such a program would be to regularly monitor the quality of the community's water source in order to track fluctuations across time. The relevant water quality tests and preliminary information gathered by the EWB-Guatemala office is outlined in Section 2.3.3.

A multi-disciplinary approach to the infrastructure assessment will be done as described in the following sections. This assessment will help to determine recommendations and define the scope of any modifications done as a part of this project during the implementation phase.

1.4 Scope of Work

The central focus of the scope of work is to provide the community with more reliable access to water. At this time, approximately 75% of the homes in the community are connected to the existing water system. The existing system consists of a spring catchment box and distribution piping from the box directly to the homes. The community is marked by large differences in elevation, and this existing system design creates inconsistencies in water supply. Specifically, homes at higher elevations suffer from extreme lack of water and have reported that they often only have water between midnight and 3 am.

A preliminary design was developed for a new system by Agua para La Salud in 2018 at the village's request. This information was shared with the KC Professional Chapter by EWB-Guatemala who subsequently sent the design drawings to the team for reference. This proposed design consists of a conduction line, water storage tank, chlorination system, and distribution network with meters. This new system would rely on the same spring box source for water supply. The flow at the water source has been measured 0.6 liters/second. If the Guatemalan government standard of 80-120 liters per person per day is followed, this would provide enough water for approximately 500 people. The approximate cost of the proposed system was determined to be $35,000.

This preliminary design encompassed the different scopes of work for the project. These scopes can be best defined as Source, Transmission, Storage, and Treatment. The source, or springbox, is necessary for collection of water while the transmission system (water distribution piping) allows water to flow from the spring box to the homes of the community. The storage system would consist primarily of a water storage tank. The final portion of scope may include a treatment system in order to provide water that can be safely consumed by the community. All four portions of scope will need to be executed thoroughly in order to provide the community with the improved water supply that they need.

1.5 Potential Solutions Considered

To achieve community goals, this project requires a multifaceted approach and, as such, the project team will need to consider multiple potential solutions for each task of the project. Each task follows with its own potential solutions.

- Viability of the current source.
    - Through two preliminary assessments the team was able to conclude that the flow at the sources is likely adequate for the community's needs. The main question is this: Once a fully functioning system is implemented, how will that affect the other end users of this water source?
    - The primary option would be to use the current source as the water supply.
    - The secondary option would be to work with the community to identify other potential water sources. An alternate source would have to be close to the community and be able to supply water to the community through a gravity fed system.
- Transmission
    - After further investigation on May 15, 2019 it was determined that the flow rate at the source and the flow rate at a collection tank

downstream were nearly identical. This indicates that the transmission piping is likely functioning correctly.
    - The primary option would be to reuse all of the existing transmission piping.
    - An alternative would be to salvage sections of the existing transmission piping and replace sections if it is found that there are deficiencies in the piping.
    - An alternative would be to replace the entire transmission piping system if it is deemed that a new pipeline is the only solution that will provide a life cycle of 20+ years. However, if the community is invested in the idea of a new transmission line, this might be the best solution.
- Storage
    - The current function of Tank 2 is unknown, but we expect, due to its limited size, it will not have the capacity to function as the community storage tank. We will confirm this theory and evaluate storage needs and alternatives during the assessment trip. Two potential solutions to the lack of sufficient water storage include:
    - Concrete pad with HDPE tank
        - This solution is the easiest to construct and cheaper. However, storage capacity will be limited to the largest locally available tank. With a plastic tank earthquakes are not an issue. If the concrete pad is damaged by such an event, it would be easier and cheaper to repair than repairing a concrete tank.
    - Concrete tank
        - This solution is more difficult to construct and more expensive. However, this tank should last longer than its plastic counterpart and be sturdier in the long term. Earthquakes could be an issue for this tank construction method.
- Treatment
    - Water quality results from tests taken on May 15, 2019 show that E. Coli and other contaminants are present in the water source. The team will conduct a second round of water quality tests during the assessment trip to confirm the first round of tests.
    - After this second set of tests are conducted, the type of water treatment will be carefully considered and identified to best suit the community's needs.
    - Chlorination
        - This is a popular form of water treatment. There are different ways to implement this treatment method whether it is at the system level or a point-of-use method.

        - Consideration must be taken to how the community members perceive chlorine as a viable treatment method.
    - Combination carbon and sand filter
        - A carbon/sand filter might not suffice in eliminating all of the contaminants found during the water quality tests. This needs to be verified post-assessment trip.
        - However, a carbon/sand filter could still be used as a secondary treatment method.
    - UV treatment (requires electricity and may not have the available materials for replacement locally)
        - This treatment method could prove to be a good solution given the availability of replacement materials, community understanding of how to maintain the system, and readily available electricity to power UV lights.
- Distribution
    - To understand and develop realistic solutions to the current problems with the distribution system, the team will need to gather more data.
        - One potential solution could include zoning the community to mitigate pressure and flow shortages for houses at the end of the distribution line.
        - Another solution could be to simply remove and replace the current distribution piping. This approach assumes that the problems within the system are related to old or improperly installed piping as opposed to poor system design.
        - The design of this system will be more thoroughly analyzed in the alternatives analysis.

1.6 Project Team

The Responsible Engineer In Charge is Scott Struck. The professional mentor is Stephen Collins. The internal reviewers are Adam Byrnes and Audrey Freiberger of the Kansas City Professional chapter. The Project Lead is Jake Sanders and the Director of Projects is John Kelley. These are the team leaders who are collaborating with many other engineers and volunteers with the EWB-KC chapter to see this project through a successful implementation. Each of the team leaders have resumes on their respective Volunteer Village member profile.

1.7 Community Partners

The Community Development Council COCODE is the official organization legally recognized by the municipality of Sololá and the state and will be serving as the CBO for this project. The board of directors of this organization is elected

every four years, and the current board of nine members was elected 6 months ago to address the need of improved potable water system in the community. The COCODE board of directors are elected for four year terms by community members through a voting process that includes every person. Once they are elected, they need to be legalized by the municipality. Once they have the municipality's recognition, they begin their community mandate. The community is represented through COCODE and everyone is the community is able to share their opinions and ideas. COCODE in conjunction with the community will have the ultimate decision authority for this project. The COCODE will work with the municipality, EWB-KC, and EWB-Guatemala to provide unskilled labor during the project implementation and will be responsible for maintenance, operation of the system, and planning the implementation of collection fees for the drinking water once the service gets established. COCODE will also coordinate all the logistics for the community's contribution to the project.

The Non-Governmental Organization (NGO) our chapter will be working with for this project is the Engineers Without Borders Guatemala office. Their primary function will be to facilitate the in-country aspects of the project as well as help and advise our chapter for critical project decisions. The deputy director, Waleska Crowe, is the primary contact from EWB for the Municipality of Sololá and the COCODE of Los Churuneles II.

The local government partner is the Municipality of Sololá. The municipality will provide 25% of the cost for materials. They are also open to help the community with any paperwork that they need to complete to get the construction permissions. When the construction is completed, the municipality will be able to provide assistance if the community needs it.

1.8 Reference Projects (Conducted by EWB-USA)

The Kansas State University project in El Amate, Guatemala had lessons learned to share that will be beneficial to the Churunalles II project team. The EWB-KSU project team highlighted the advantage of having local EWB offices in Guatemala and encouraged leveraging that connection. For example, they utilized a bus/taxi service and the EWB truck while traveling. They also mentioned using the accommodations recommended by the EWB office in Guatemala. Kristen Jones of the EWB-KSU travel team reflected on their engineering design and lessons learned by stating "we probably should have gone with our gut and the design that is most common in the area. We had all our calculations and drawings finished for a traditional septic tank and leach field but ended up changing everything about a week before the report was due to incorporate plastic septic tanks instead. About a year after the project was completed, only 2/3 latrines are working, and there were many complications during construction. I think this may

have been avoided if we went with a more traditional or naturalistic design." Taking this lesson learned, the EWB-KC chapter will be calculating before making last minute changes that could make or break the outcome of the project. Kristen also mentioned the challenge of communicating with in-country partners and recommended using WhatsApp group messages and an efficient way to communicate. EWB-KC will look into contacting our in-country partners using WhatsApp.

The EWB-KC Churuneles II project team was in communication with Macy Scott of the University of Colorado at Boulder chapter of EWB about their ongoing water system project in Caserio Totolya, Guatemala. Macy's biggest advice was to allot more time than is thought necessary for every activity and task. The goal of the Caserio Totolya project is very similar to the goal of the Churuneles II project. Both are water distribution projects with the water originating at a spring that is shared by multiple communities. As both communities are located in similar regions of Guatemala, both also contend with a dry season that limits the amount of water the communities receive for parts of the year. EWB-CU provided three options in their Alternative Analysis for the materials of pipe for the conduction line replacement: PVC, HDPE, and galvanized steel. The Caserio Totolya project has compared the three options and is moving forward with design using a HDPE conduction line. Implementation will occur in the summer of 2019.

Max Schmiege of the Wisconsin Professional Chapter was able to provide some insight into working in Guatemala. "I have worked on projects in Guatemala for 15+ years, mainly bridges and water systems. I would suggest using the various resources regarding water system design that EWB has available on its website. Plan plenty of time into your schedule to communicate and coordinate with the local EWB contacts and specific community leaders. Think simple as much as possible in terms of design."

Based on the information gathered from other project teams with similar projects in similar regions of Guatemala, the Churuneles II project team will make every effort to utilize all resources available when it comes to communication with the EWB team in Guatemala and the community itself. More time will also be accounted for in the schedule to ensure that all necessary information is able to be collected during the trip to the community.

2.0 Assessment Activities

2.1 Partnership Formation

2.1.1 Community Members

Our chapter will form a strong partnership with community members by establishing a level of respect and trust between the community and our chapter. We will take the time to meet with each household throughout the week to get their thoughts on the problems with the current water system and talk through the solution they envision. This will help to ensure that all community members have a voice in the decision making process. The project team wants to execute the project while respecting the communities' opinions. By doing this, the team hopes to help motivate them to carry out a continuous operation and maintenance process on the system. The goal will be to come to a mutual understanding of both the problem and the solution. The team will also make sure each party has a clear understanding of their responsibilities and expectations during the project implementation.

2.1.2 CBO Leaders

Our chapter will organize a formal meeting with the relevant leaders of COCODE at the beginning of the trip to discuss the project team's current standing. We intend for this to be an open discussion to gather any project details that could have been lost in translation between the community and the EWB Guatemala office. COCODE's opinion on the project will provide valuable perspective on what metrics should be used to quantify project success. A secondary benefit of this meeting will be to obtain on any new developments in the community since the EWB Guatemala office last communicated with them. Our chapter will also set-up a meeting with COCODE leaders for the end of the implementation trip to recap all that was accomplished and what the plan is going forward with the project.

2.1.3 Local Government

During this implementation trip our chapter will discuss potential local government contacts with EWB Guatemala, COCODE, and the community. There are not currently any plans for formal meetings, but at a minimum the team would like to gather a few names and contact information for people within the local government. Having the contact information of local officials who may be willing to work with us throughout

the duration of the project could potentially provide value in the run-up to the implementation of the project. If there is an opportunity and time permits to meet with local government officials, we will send a small group to discuss our intentions with this project and establish a partnership.

2.1.4 Contractors

During the trip, the team will attempt to establish relationships with a local contractors that may be able to help with the implementation phase of the project. By establishing these contacts, the team hopes to have resources for both material sourcing and skilled labor that may not otherwise be available. The team's current plan is to investigate the construction of the existing spring box to find out if a local contractor carried out the work. If it was constructed by a local contractor that is still available to the team, that contact could be invaluable to the project.

2.1.5 Suppliers

Our plan is to be proactive by doing research on possible suppliers in the area so that we have a list of suppliers to visit. During the day we are in Sololá before going to the community, we will visit the suppliers on our list to get an idea of pricing, availability, and willingness to work with our chapter. If we aren't successful that first day, we will find opportunities to continue our search in Sololá or the surrounding areas on the back end of the assessment trip.

2.2 Project Feasibility

In order to develop an understanding of the feasibility of the project, the project team will need to evaluate the quality of the water source and the topography of the region for the water conduction line. The execution of a successful project will hinge on the ability of the source and distribution system to support the water supply needs of the entire community, and a thorough understanding of the balance between supply and demand will need to be developed.

The project team will gather the relevant information outlined in the Water Supply scoping worksheet for spring water sources and gravity pipelines. This information includes rainy season flow capacity, dry season flow capacity, water quality information, total elevation change, length of piping required, number of aerial crossings, right of way negotiation, and ownership documentation.

2.3 Detailed Technical Data Collection

2.3.1 General Data Collection

Technical data collection for the project will focus on two key elements of the project - water supply and water storage systems. This focus includes both existing and proposed systems, as well as the flow rate of water at the existing spring box. The key pieces of information that must be obtained while on the assessment trip are survey data for the pipe routing, water quality testing, and volumetric flow of water available to the community.

2.3.2 Survey and Geospatial Data Collection (Piping)

During the assessment trip, the EWB-KC team will collect geospatial data (coordinates and elevation) of relevant features using a calibrated GPS. Relevant features include the spring boxes, valves, existing water tanks, the parcel for proposed water tank, existing and proposed pipeline alignments, locations where the existing pipeline is exposed, road crossings, stream crossings and drastic changes in elevation. Data of the houses and buildings already connected to the pipe network and the ones that will be connected in the future (56 houses out of 75 already have service) will be collected in coordination and with the permission of the residents. The EWB-KC team will also check if local sources of detailed topography and hydrography exist.

The data collected will be used to confirm and supplement the information provided by the EWB Guatemala office. The data will also be used to evaluate the preliminary design of the proposed water distribution system that was provided to EWB-KC when the project was assigned to the chapter.

2.3.3 Data Collection for Need #1: Water Sampling

EWB-KC will perform water quality testing on site. Initial water sampling will be conducted at the community and the community's water source. After the assessment, the Los Churuneles II project team will determine if a regular water quality testing program is necessary. If a water quality testing program is needed, we will work with EWB-Guatemala to establish a regular program.

A preliminary list of water quality tests include pH, alkalinity, hardness, free and total chlorine, nitrite and nitrate, dissolved oxygen, fecal coliform, E. coli, aerobic bacteria, and total dissolved solids. Descriptions of these

water quality parameters and testing equipment are included below. Water quality standards and tolerances are shown below in Table 1.

1. pH is the measure of the acidity of the water and will be measured using test strips #2755250 and #2745650 from Hach.
2. Alkalinity is the ability to resist changes in pH and will be measured using Hach test strips #2755250 and #2744850.
3. Hardness is the concentration of metal ions, including calcium and magnesium. The hardness will be measured using test strips #2755250 and #2745250 from Hach.
4. Free and total chlorine measures the disinfection of treated waters. Free and total chlorine will be measured using the Hach test strip #2755250.
5. Nitrite and Nitrate are organic forms of Nitrogen and are byproducts of human and animal waste. These concentrations will be measured using the Hach test strip #2745425.
6. Dissolved Oxygen is the oxygen concentration in water. Dissolved Oxygen will be measured using the test strip #146900 from Hach.
7. Fecal coliform is a bacteria found in the intestines of humans and warm-blooded animals. Fecal coliform will be measured using the test kit #4-3616-UV from LaMotte.
8. E. coli is a bacteria found in the intestines of animals. E. Coli will be measured using the test kit #4-3616-UV from LaMotte.
9. Turbidity measures the clarity of water and will be measured using the LaMotte test kit #7519-01.
10. Aerobic bacteria is the measure of aerobic bacteria in the water. This bacteria will be measured using the test kit #2610910 from Hach.
11. Total Dissolved Solids (TDS) is a measure of the total organic and inorganic substances in a liquid. TDS will be measured using a low range tester from Hach #9531300.

Table 1: Water Quality Standards and Tolerances

Parameter	EWB Guidance	EPA Regulations	WHO Guidelines
pH	6.5-8.5	6.5-8.5	-
Alkalinity	-	-	40-180 mg/L

Hardness	-	-	40-180 mg/L
Free and Total Chlorine	4 mg/L	4 mg/L	5 mg/L
Nitrite	1 mg/L	1 mg/L	3 mg/L
Nitrate	10 mg/L	10 mg/L	50 mg/L
Fecal Coliform	0	0	0
Escherichia Coli	0	0	0
Turbidity	5 NTU	-	4 NTU
Bacteria	0	-	
Total Dissolved Solids	-	500 mg/L	-
Arsenic	0.01 mg/L	0 mg/L	0.01 mg/L
Lead	-	0 mg/L	0.01 mg/L

On May 16, 2019, EWB-Guatemala conducted a water quality test of the current water system in Los Churuneles II. This water quality test included all of the EWB required parameters. However, some of the contaminants that were found in the water didn't pass standard regulations. The current water source tested positive for E. coli and total coliforms. Thus, the water might be contaminated with animal and human wastes. The amounts of Nitrite and Manganese found in the current water system didn't pass EPA and WHO regulations, respectively. EWB-KC will perform another water quality test in the community during the rainy season to compare the two results.

2.3.4 Data Collection Need #2: Health Survey

During the assessment trip, the project team will ask community members the following questions in order to gain further information on the health of the community:

- What do people use for bathrooms and what is the approximate percentage of each? (flush toilets, pit latrines, neighboring fields, others).
- How do people dispose of their garbage?

- Are there community bathroom facilities? How many and where are they?
- What are the five most frequent injuries/illnesses that affect the community?
- Estimate the quantity/percentage of people affected each year?
- What do people think is the cause of this illness?
- Has your family experienced illness due to unclean water?
- Is there a difference between the overall health of men/women?
- What regular personal hygiene activities do community members do, and with what frequency? (Wash hands, brush teeth, bathe, etc.)
- What is daily water consumption?

2.3.5 Data Collection for Need #3: Source Survey

The current source of water for the community comes from two spring boxes. These spring boxes provide water for two other distribution systems other than the one delivering water to Los Churuneles II. During an assessment trip to the community on May 15, 2019, a date within the dry season, the EWB Guatemala office collected flow data at the existing storage tanks, one near the current water source and the second near the community houses. The inflow rates were measured at 0.710 liters/second (0.0251 cfs) at the tank closest to the source and 0.695 liters/second (0.0246 cfs) at the second tank. It is presumed that the loss in flow is due to small cracks in the first tank. Water levels in the tanks were measured to be at approximately 4 inches. It should also be noted that most of the water for all three systems was coming from only one spring box, possibly due to low seasonal flows.

During the assessment trip the EWB-KC team will take another set of flow measurements at the tanks to get an idea for a range of flows at a different time of the year. The team will also check water levels in the tanks and the spring boxes. It is planned to ask people from the community if the tanks ever fill and to what level, if they see plenty of water flowing into the tanks but little makes it to the community, and a general idea of how the source behaves throughout the year. The data will be used to determine if the current source is sufficient to provide for all three communities.

Other sources of water will be explored and the team will evaluate the feasibility of their use and implementation. The EWB-KC team will ask the community if there are other streams they would consider using and take flow measurements as necessary. Ideally, a new source would be located near the community at a higher elevation to flow through gravity only,

have sufficient and constant flow throughout the year and it would require minimal treatment. At the present time no other streams have been identified, so community input is necessary.

2.4 Climate Change Data Collection

2.4.1 Climate Change Questions:

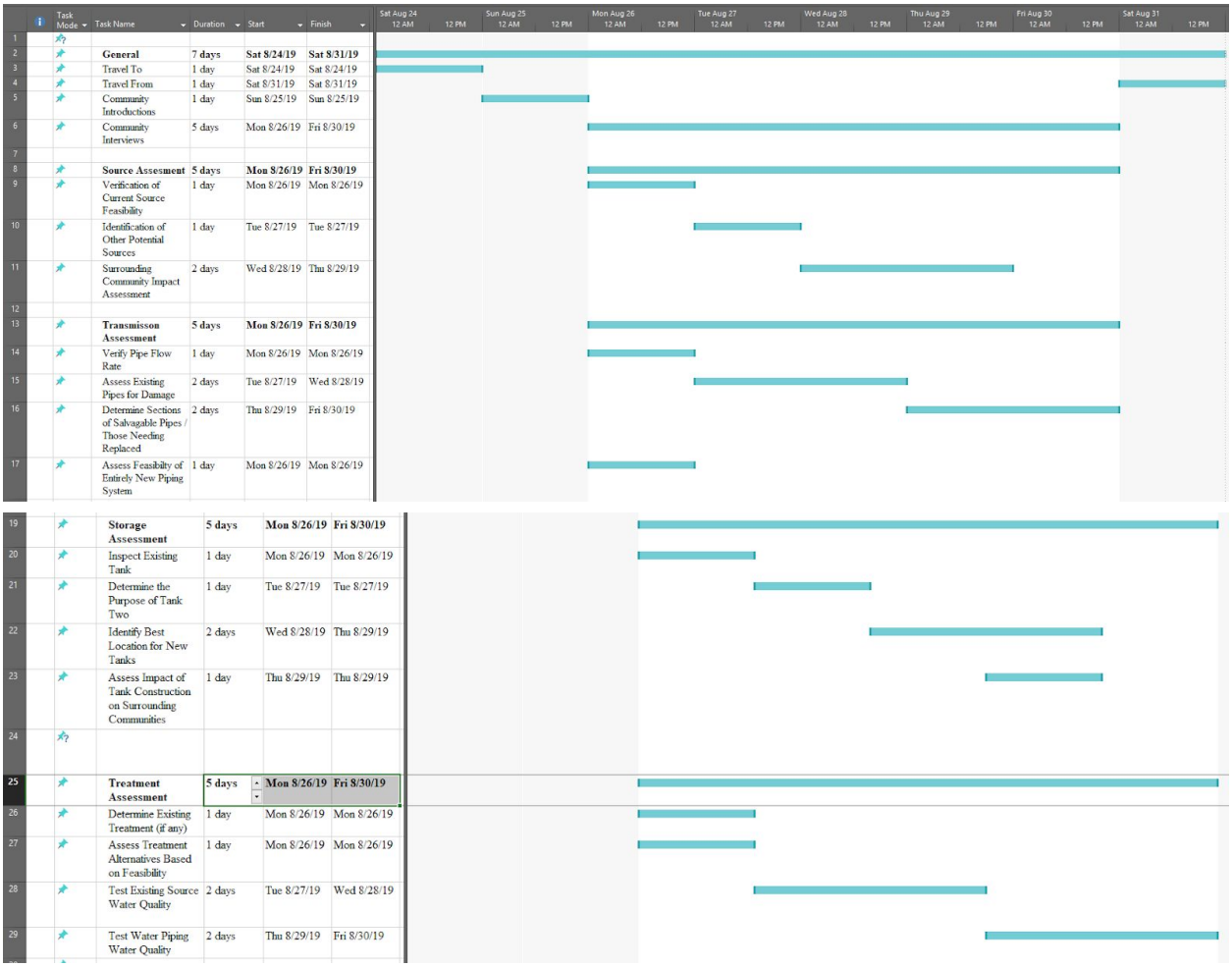
During the assessment trip, the team will ask the following basic climate change questions in order to develop an understanding of whether climate change has affected the community:

- Has it gotten hotter or cooler in the last ten years?
- Has there been a change in your drinking water supply in the last ten years?
  - If so, how?
- Have rainfall patterns changed in the last ten years?
  - If so, how?
- Has the change in rain affected how you grow crops?
  - If so, how?
- Has drought impacted your community in the last ten years?
  - If so, how?
- Has a major storm(s) impacted your community in the last ten years?
  - If so, how?

3.0 Schedule

3.1 Schedule overview

The purpose of this trip will be to assess the current water situation in the village, evaluate the location for the proposed water tank, and familiarize ourselves with any aspects of the site that may cause design issues (i.e. difficulty transporting supplies, geographic concerns, etc.) so that we can implement solutions into our plan. We will also be connecting with the local community, and begin building the relationships necessary to make the project a success.



	Task Mode	Task Name	Duration	Start	Finish
1					
2		**General**	**7 days**	**Sat 8/24/19**	**Sat 8/31/19**
3		Travel To	1 day	Sat 8/24/19	Sat 8/24/19
4		Travel From	1 day	Sat 8/31/19	Sat 8/31/19
5		Community Introductions	1 day	Sun 8/25/19	Sun 8/25/19
6		Community Interviews	5 days	Mon 8/26/19	Fri 8/30/19
7					
8		**Source Assesment**	**5 days**	**Mon 8/26/19**	**Fri 8/30/19**
9		Verification of Current Source Feasibility	1 day	Mon 8/26/19	Mon 8/26/19
10		Identification of Other Potential Sources	1 day	Tue 8/27/19	Tue 8/27/19
11		Surrounding Community Impact Assessment	2 days	Wed 8/28/19	Thu 8/29/19
12					
13		**Transmisson Assessment**	**5 days**	**Mon 8/26/19**	**Fri 8/30/19**
14		Verify Pipe Flow Rate	1 day	Mon 8/26/19	Mon 8/26/19
15		Assess Existing Pipes for Damage	2 days	Tue 8/27/19	Wed 8/28/19
16		Determine Sections of Salvagable Pipes / Those Needing Replaced	2 days	Thu 8/29/19	Fri 8/30/19
17		Assess Feasibilty of Entirely New Piping System	1 day	Mon 8/26/19	Mon 8/26/19
19		**Storage Assessment**	**5 days**	**Mon 8/26/19**	**Fri 8/30/19**
20		Inspect Existing Tank	1 day	Mon 8/26/19	Mon 8/26/19
21		Determine the Purpose of Tank Two	1 day	Tue 8/27/19	Tue 8/27/19
22		Identify Best Location for New Tanks	2 days	Wed 8/28/19	Thu 8/29/19
23		Assess Impact of Tank Construction on Surrounding Communities	1 day	Thu 8/29/19	Thu 8/29/19
24					
25		**Treatment Assessment**	**5 days**	**Mon 8/26/19**	**Fri 8/30/19**
26		Determine Existing Treatment (if any)	1 day	Mon 8/26/19	Mon 8/26/19
27		Assess Treatment Alternatives Based on Feasibility	1 day	Mon 8/26/19	Mon 8/26/19
28		Test Existing Source Water Quality	2 days	Tue 8/27/19	Wed 8/28/19
29		Test Water Piping Water Quality	2 days	Thu 8/29/19	Fri 8/30/19

4.0 Go/No Go Decision

The sections below outline the relevant considerations for the team's Go/No-Go decision process for the project.

- Guatemala-EWB Office & COCODE Relations
    - Go: EWB-KC is able to develop and maintain a strong relationship with both the EWB Guatemala office and COCODE. This includes regular communication throughout the program as well as receiving support leading up to and during travel to Guatemala. COCODE's relationship with Los Churuneles II is strong and includes frequent visits to the community to assist with program planning and organization.
    - No Go: The EWB Guatemala office and COCODE are unable to provide support in the planning and execution of the projects. COCODE is unable to answer questions relevant to the success of the program.
- Safety of Area of Travel

    - Go: The US State Department recognizes that the area of travel is safe for travel, and no area visited is on any sort of Do Not Travel list. Additionally, EWB-KC and the EWB Guatemala office review the area and deem it to be safe for travel.
    - No Go: Guatemala and/or the Los Churuneles II community are deemed unsafe for travel by the US State Department, the EWB Guatemala office, or EWB-KC.
- Commitment of the Community
    - Go: Los Churuneles II shows in meaningful ways that it is committed to the program and is willing to contribute 5% of the funding required for projects. The community is willing and able to assist in the construction of the projects as well as provide the necessary care to maintain them.
    - No Go: Los Churuneles II is not supportive of the projects' success and its not interested or willing to maintain the projects after implementation. The community is unable to financially support the project or assist with labor in building the projects.
- Feasibility of the project
    - Go: There is a sufficient water supply in the area such that building a storage tank is a reasonable design. The construction of such a storage tank and associated distribution pipeline doesn't prevent access to water for other neighboring communities.
    - No Go: There is not sufficient water supply in the area. The construction of a storage tank and distribution line will result in neighboring communities not having sufficient water access.

4.1 Other Factors Contributing to or Hindering Development

Local support will come largely from the EWB-Guatemala office, who will assist in making preliminary study visits to the community before EWB-KC travels to the site and will serve as the primary point of contact with the community. A natural factor that could hinder progress towards the project goal is the weather. During the rainy season, roads to access the community can become flooded. This will be monitored closely with the help of the EWB-Guatemala office in the days and weeks leading up to travel. Other natural disasters, such as fires or earthquakes, would also hinder the project goals. Earthquakes are a relatively common occurrence in Guatemala, as it lies on the Motagua and Chixoy-Polochic fault complex. An analysis of this impact will be conducted through interviews with the community and research regarding recent seismic activity within the region.

5.0 Baseline Monitoring Data Collection

5.1 Baseline Data

Baseline data for the water supply and distribution system project in Los Churuneles II will be gathered in compliance with the International Community Program's Planning, Monitoring, Evaluation and Learning (PMEL) program during the assessment trip. Answers to PMEL questions (Attachment D) will be sought during the assessment trip through conversations with stakeholders, collection of engineering data, and community surveys. This information will be updated throughout the life of the project to EWB standards for project impact reporting. Preliminary dry season data was gathered by the EWB Guatemala office during their trip to the community in May 2019.

During the assessment trip, the team will gather engineering data and information from the community. The local EWB Guatemala office will also be relied upon to provide any baseline data they possess. The chapter may need to train the community to complete some PMEL activities when the chapter is not in the community (i.e. water quantity information in the rainy or dry season).

5.2 Beneficiary Analysis

While on the trip the chapter will evaluate if the beneficiaries reported are in line with the reporting standards for ICP project beneficiary procedures. The beneficiaries for the project are the residents of Los Churuneles II. The project team will attempt to quantify the number of beneficiaries via community surveys and communication with the local development organization COCODE. The preliminary information provided by the EWB Guatemala office indicates that there will be 300 direct beneficiaries of the project. The EWB-KC team will evaluate the validity of this number during the Assessment trip.

6.0 List of Attachments

Attachment A: Drawing Package
Attachment B: Data from Previous Assessment trip (if Applicable)
Attachment C: Partnership Agreement
Attachment D: Monitoring Questions

Section 6.0 List of Attachments:

- Drawing Package; include at a minimum a plan view drawing of the site with an aerial of the whole community and zoomed in plan view figures of all potential project locations. This article shows one method on how to prepare a preliminary CADD layout. https://ewb-usa.force.com/VolunteerVillage/s/article/Preparing-a-Preliminary-CAD-Layout

- List all attachments included as separate files.

