# Waterworks at Mecklenburg Tobacco Warehouse

# Documentation of the waterworks at the Mecklenburg Tobacco Warehouse

2013

Prepared by
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# *Introduction*

## *Executive Summary*

The following report is a supplement to the Historic Structures Report (HSR) for the Mecklenburg Tobacco Warehouse prepared by Charles Belfoure dated March 20, 2010. The purpose of this report is to present a current understanding of the waterworks that were installed in the building in the 1920s and supplied water to the town of Shepherdstown until the 1970s. This report will provide a description of the historic waterworks structures that are extant in the building at time of documentation. Documentation of these structures will allow for their removal and better facilitate an adaptive reuse of the Mecklenburg Tobacco Warehouse. The report is prepared for the Friends of the Shepherdstown Riverfront, a nonprofit organization with a lead project to protect and restore the Tobacco Warehouse.

## *Methodology*

### *Building and Historical Analysis*

The building analysis was generated from investigation of existing documentary evidence and historic fabric. Sources of documentary evidence include the Historic Structure Report and photographs both of which are located in hardcopy through the files of the Friends of the Shepherdstown Riverfront in Shepherdstown, West Virginia as well as on their website (http://www.shepherdstownriverfront.org). The existing condition of the warehouse was documented and photographed. Unless otherwise noted, all photographs in this report were taken by Tyra Guyton between November 2012 and February 2013. In addition, a transcribed oral history dated November 29, 2011 of Bill Myers, a former Shepherdstown waterworks plant operator, was instrumental in determining the function of the extant equipment in the warehouse.

# *Historic Waterworks Analysis*

## *Waterworks*

Since the completion of Charles Belfoure's HSR, much of the interior of the Mecklenburg Tobacco Warehouse has been gutted except for the equipment related to the waterworks and a small portion of the first floor near the door facing Princess Street. This allowed for a more complete investigation of the waterworks.

Water entered the facility by means of an electric pump at the northeast corner of the building (Figure 1). Located on the ground floor, this early pump pulled water out of the Potomac River according to Belfoure's HSR but in Bill Myer's oral report, he recalls water being pumped out of Town Run. The pump is bolted to a concrete base measuring 6 feet 3 inches by 2 feet 5 inches. Below the pump is a reservoir that may have acted as a holding tank before pumping the water to the aerator tank located on the second floor level. According to Bill Myers, plant operator in 1969, use of this earlier pump was discontinued around 1959 and was replaced by two smaller electric pumps located to the left of this earlier pump (Figure 2).

**Figure 1**

*Early water intake pump used to pull water from the Potomac River circa 1920s*

**Figure 2**

*Smaller pump used to pull water out of the Potomac River*

Once water entered the building, it was pumped to a concrete aerator tank located in the northwest corner of the building. This tank was open at the top and accessible from the first floor (Figure 3). This area is referred to as the cascade area by Bill Myers. Mr. Myers stated water flowed by gravity through trays filled with coal. This coal filtration would aerate the water. A cast iron pipe on the east side of the tank may have been where water entered the tank (Figure 4). The tank is elevated 6 feet 11 inches from the ground floor by five concrete piers that are 2 feet 7.5 inches square at the bottom and taper upwards to 2 feet square. The tank is approximately 4 feet 8.5 inches by 13 feet 4 inches and is 2 feet 7 inches deep. The tank is divided into two separate concrete areas that are approximately 3 feet by 10 feet (Figure 5). In Figure 6, a smaller diameter pipe can be seen in one side of the aerator tank. This pipe appears imbedded in the concrete at the bottom of the tank. It is unclear the function of this pipe but it is assumed it was part of the aeration process. According to Bill Myers, water flowed by gravity from the aerator tank to the settling basin through a pipe running underneath the first floor. Figure 7 shows a pipe coming through the bottom of the aerator tank, but it is unknown is this is the pipe referenced by Mr. Myers.

**Figure 3**

*Aerator or Cascade Tank*

**Figure 4**

*Cast Iron valve and pipe on east side of aerator tank*

**Figure 5**

*Inside Aerator tank*

**Figure 6**

*Pipe inside one section of aerator tank*

**Figure 7**

*Pipe under aerator tank*

The settling basin is located along the south wall and takes up much of the space in the building (Figure 8). The basin, made of concrete, is approximately 31 feet by 33 feet. While the exterior wall of the basin measures 9 feet 7 inches high, the interior depth of the basin has been reduced to 5 feet 8 inches due to accumulation of settlement. The concrete walls of the tank are 1 feet 3 inches thick with the corners being thicker. A third story loft located above the settling basin has since been removed and is described in Charles Belfoure's HSR. According to Bill Myers, this loft served as a storage area for chemicals. A beam above the settling basin held lights that allowed for plant workers to see into the water. Mr. Myers states that an alum machine was located in the third floor loft and this machine allowed for alum, a chemical that helped settle particles out of the water, to be poured into the basin.

**Figure 8**

*Settling basin*

From the settling basin, water flowed by gravity through a cast iron pipe in the northwest corner of the basin to a metal filtration tank located just outside the north east corner of the basin (Figure 9, Figure 10 and Figure 11). The metal filtration tank measures 15 feet 1.5 inches by 9 feet 2 inches and is divided into three chambers. The top of the filtration tank is open and accessible from the first floor. Metal railing runs around the parameter and extends up an additional 3 feet 3.5 inches above the sides of the tank. Water enters the bottom of each chamber from three cast iron pipes on the south side of the tank (Figure 12). These pipes are equipped with cutoff valves that extend up making them accessible from the first floor. According to Bill Myers the tanks contained coal which filtered the water as it moved up the tank. The water exited from the north side of the tank through cast iron pipes attached at each chamber at approximately 2 feet 6.5 inches from ground level (Figure 10). These pipes are also equipped with cutoff valves that were accessible from the first floor. In the oral history with Bill Myers, he explains that the valves were turned to either shut off or open up water flow to back flush the coal filters. The three pipes on the north side of the filtration tank ran underground to the clear well.

Figure 9

*Pipe caring water from settling basin to filtration tank*

**Figure 10**

*North side of filtration tank where water exits tank for clear well*

**Figure 11**

*Top of filtration tank*

**Figure 12**

*South side of filtration tank where water enters tank from settling basin*

The clear well is a 9 feet 2 inches tall metal cylinder located between the filtration and the aeration tanks (Figure 13). The diameter of the clear tank is approximately 5 feet and the top is open and accessible from the first floor. A metal railing extends up an additional 3 feet 3.5 inches from the sides of the tank. Bill Myers explains that the clear well was the last place water was treated before being pumped to a larger storage tank. As Mr. Myers recalls, chlorine tanks were located in the first floor office along the north wall. Chorine ran through a small metal line from these tanks to the clear well and delivered chlorine to water in the clear well. This line can be seen in Figure 14 along with a wire that held a float to indicate the water level in the tank. Mr. Myers said the water level in the tank, was usually never allowed to get very high. Water was pumped from the clear well to a large exterior storage tank located uphill from the warehouse.

**Figure 13**

*Clear well*

**Figure 14**

*Interior of clear well*

**Figure 15**

*Pipe running through clear well to storage tank*

The pumps used to move water from the clear well to the storage tank were called the high service pumps. The high service pumps were located on the first floor along the west wall between the Princess Street door and the settling basin (Figure 16, Figure 17 and Figure 18). The pumps sit on a platform that is approximately 12 feet 9 inches by 7 feet 10 inches. Water was pumped from the clear well to a storage tank located uphill from the warehouse through a cast iron pipe that exited the warehouse through the west wall near the area of high storage pumps. According to Bill Myers the storage tank was located off of West German Street behind the current Sheetz store. The electrical service for the warehouse is located on the west wall above the high service pumps. The high service pumps were equipped with check valves, but Mr. Myers recalls that the pressure on the check valves were set so low that if the plant lost power, the main valves would have to be closed to keep the water from the storage tank from flowing back into the waterworks plant.

**Figure 16**

*High Service Pumps*

**Figure 17**

*High Service Pumps*

**Figure 18**

*High Service Pumps*

## *Summary*

From the 1920s Shepherdstown's water supply was processed through the waterworks facility located in the Mecklenburg Tobacco Warehouse. Water entered the facility in the early years via a large electric pump at the north east corner of the building. This pump was later retired in favor of two smaller pumps. Water was pumped to an aerator tank located on the first floor in the north west corner of the warehouse. Here water was oxygenated by allowing the water to fall over trays filled with coal. Water flowed by gravity through the trays to the bottom of the aerator where it flowed to the large settling basin located on the ground floor of the south facing portion of the building. This basin took up nearly half of the warehouse space. In the settling basin, particles were allowed to settle out of the water. This was facilitated with the use of alum that was distributed into the tank from an alum machine located on the third floor loft. The water flowed again by gravity from the settling basin to the filtration tank. The metal filtration tank was located on the ground floor and extended up to the first floor. Here water entered the three chambers of the tank through gravity and flowed up through coal filters. These filters could be back flushed by utilizing cut off valves located on the entrance and exit pipes to the tank. Water flowed from the filtration tank to a metal clear well located on the ground floor and extending up to the first floor. In the clear well, water was chlorinated before being pumped to an external storage tank by the high services pumps. The large external storage tank was located uphill from the warehouse on West German Street near the current Sheetz location and is no longer extant. According to Bill Myers, plant operator hired in 1969, the whole process took more than six hours to complete. Four workers operated the waterworks plant, while an additional three people worked outside the plant doing maintenance on the water line. The waterworks moved to a new facility in 1974 and the tobacco warehouse has continued to remain vacant since that time.

# *References*

**Transcript of Interview with Bill Myers about Waterworks at Mecklenburg Tobacco Warehouse**

Interviewee: Bill Myers

Interviewer: Dr. Keith Alexander

Date: November 29, 2011

Place: Mecklenburg Tobacco Warehouse, Shepherdstown, West Virginia

Transcriber: Tyra Guyton (January 8, 2013)

**Abstract:**

Bill Myers began work as a plant operator at the Shepherdstown water treatment plant in 1969. At that time the water treatment plant was located in the Mecklenburg Tobacco Warehouse. Bill is the last surviving employee who remembers how the water treatment plant ran while located in the warehouse. During this 12.5 minute interview, he walks us through how water was processed in the warehouse and how each of the different pieces of equipment functioned. Bills interview sheds light on the history of the Mecklenburg Tobacco Warehouse and how it operated as a water treatment plant up until 1974.

**KA:** I'm here with Mr. Bill Myers and today is the 29th of November 2011 and we are at the Mecklenburg Tobacco Warehouse and Bill Myers has graciously agreed to sort of walk us through the way the old water plant use to work. And first of all, when did you work here?

**BM:** I started here in 1969.

**KA:** 1969. And when did they kind of move the plant?

**BM:** 1972.

**KA:** So they decommissioned it after…

**BM:** 1974, I'm sorry.

**KA:** So you were here for about 5 years or so before they moved the plant. Alright, very good. Well we are here in the building. If you could kind of take us through the process, where the water came in, what the different parts of the structure did.

**BM:** There really wasn't much to it. This was our main pump station, use to be. When I started here they had discontinued using that pump probably 20 years before and we had two small water pumps here that pulled water in out of Town, Town Run. And we came up and we had a set of cascades there.

**KA:** Cascades where? I'm sorry. Ok in front of you here?

**BM:** Cascade area, whatever you want to call it.

**KA:** Ok.

**BM:** Here, raw water would come in and fall down amongst a bunch of (anthracite???) coal type substance.

**KA:** I'm sorry, what substance you said?

**BM:** (Anthracite???) coal. It broke the water up and aerated it. Then it came through here, came under the plant and went over here to the settling area, that's this basin here.

**KA:** Uh-huh. So this is the settling basin. I'm going to turn the light on here so we will see if it makes much a difference here but I don't have much battery yet so it's not going to do much of anything looks like. Alright. So the water came underneath this area here and did it come out that pipe perhaps there?

**BM:** Right, that pipe right there.

**KA:** Ok. Hopefully that will be visible. So that was raw untreated water just broken up and aerated…

**BM:** Right.

**KA:** …flowing into the settling tank here. And was this just one big settlement tank?

**BM:** One big settlement tank.

**KA:** Now, I see this beam up here with some lights attached to it, was that part of the plants functioning?

**BM:** Yeah it lit up the settlement area so you could see what was going on.

**KA:** So you could see what was going on, see if the water was adequately clear?

**BM:** And up top we had an alum machine.

**KA:** And what is that?

**BM:** Alum.

**KA:** Uh-huh, oh alum machine, Ok, got you.

**BM:** ( _____???) We only had one of them. We dumped alum up there and it came down, drop down in the settling area

**KA:** Ok.

**BM:** It helped settle particles out of the water.

**KA:** I see, alright.

**BM:** Then when it came out of the settling area and came into the three filters.

**KA:** You said these are three filters?

**BM:** Yes, these are three filters.

**KA:** Ok. And where did it come out then? You said it came out of the settling tank. Woops. [Hear sound of debris in the building clanging together.]

**BM:** Yes.

**KA:** Is there a pipe underneath here we can see?

**BM:** It's at the bottom of the settling area.

**KA:** So it's down at the lower, that would make since, alright, so it would have been this corner here. Alright, so the corner that I am attempting to show here. That's the eastern side of the building. Alright, and then you said these are three filters and did they come in through any progression here?

**BM:** No just gravity flow into the bottom.

**KA:** So all three played an equal role…

**BM:** Right.

**KA:** …in the filtration system and it was all gravity flow. And what were the filters made of, what did they consist of?

**BM:** Same stuff as we got there, (anthracite???) coal.

**KA:** Ok, so it was a coal, a coal filtration system.

**BM:** It was a three stage filter. It had gravel, then it had a finer layer, and then it had a finished layer of gravel. That filtered the water up.

**KA:** Ok, and so would those layers have been at the bottom of these filter tanks I assume?

**BM:** Bottom of the tanks.

**KA:** And this series of valves here?

**BM:** Where you maintain your-when you back wash um…

**KA:** Uh-huh.

**BM:** …you close one valve off… and then uh-the replacing valve. Close these two off and then those two up and let water out here. One would-One would let water up to the filters and the other would let it out of the filter when they were clean

**KA:** Ok, so that was a way of sort of flushing the filters out then?

**BM:** That was back flushing the filters.

**KA:** I see. And how long did the typical process take, can you give an estimate as to as, you know…

**BM:** From the time it hit the building?

**KA:** Yeah.

**BM:** To the time it got to filters? About six hours.

**KA:** Six hours, ok, until the time it exited the filters?

**BM:** How did it exit? It came out and went into the clear well.

**KA:** Oh this is the clear well?

**BM:** Clear well.

**KA:** Ok, this is this round structure here in the middle. Alright and I'm probably not going to be able to show you the bottom of this. We can barely be able to see it thanks to the light there that helps a little bit there. Ok, so this is this is called the clear well?

**BM:** Right.

**KA:** And is that a sort of old level measuring gauge or something on the side?

**BM:** Right here?

**KA:** Yeah.

**BM:** Yes that told you- it had a float on the bottom…

**KA:** Ok

**BM:** …and it told you when your clear well was low or high.

**KA:** Ok, excellent.

**BM:** Which it rarely seldom got high, we had pumps. It come through here and went in…, into the of-fice.

**KA:** Into the office, ok.

**BM:** Now wait a minute, I'm wrong, sorry. We had chlorine tanks sitting there up against the wall.

**KA:** Ok.

**BM:** And the chlorine- There was a line come out here somewhere? This is it I think. And that chlorinated the water.

**KA:** Ok.

**BM:** And from there…

**KA:** So the chlorination happened in the clear well?

**BM:** Right, and from there- it's a pipe down in there somewhere I can't see it- that sent it over to the high service pumps.

**KA:** So these are the high service pumps here?

**BM:** The high service pumps. And they in turn filled the tank.

**KA:** And the water tank this is currently up there, was that in use then or is that a relatively new one?

**BM:** No that was done, that was done in the '70s

**KA:** Ok. Was that at the same site as the old tank?

**BM:** No.

**KA:** Where was the old tank that was used?

**BM:** Right behind the Sheetz store.

**KA:** Behind the Sheetz store? Ok, so it was pushed all the way up there, alright.

**BM:** It was a- sandpipe- ( _____???) a raised tank. I think it held 250 thousand but I'm not quite sure.

**KA:** Ok. So these pumps alone were enough to pump it up the hill like that or were there a series of other pumps along the ground?

**BM:** This was all.

**KA:** Is that right? And what was the capacity of the plant, if you could put numbers on it?

**BM:** I don't even know.

**KA:** Ok. But you said the tank that's up by, behind the Sheetz was how many gallons?

**BM:** I think it was 250 thousand gallons, I believe.

**KA:** Ok. And so this is, you said it was called, what was the name of this pump again?

**BM:** The high service pump.

**KA:** The high service pump. Ok, so it pumped water out, I assume this way here, that, that large…

**BM:** Right, you see that valve right ?

**KA:** …valve there and that pipe there that's in the wall there.

**BM:** Right.

**KA:** Ok. And what was this device here, is it the intake?

**BM:** Pardon?

**KA:** Is this the intake there, I'm trying to figure what this was or is it the electrical service?

**BM:** This right here you mean?

**KA:** This here, you see the Westinghouse and the box?

**BM:** That's the electrical service.

**KA:** Oh, that's the electrical service.

**BM:** For the pumps.

**KA:** To serve the pumps. Ok. Very good. Alright. And how many co workers did you have working here when you were here?

**BM:** Uh, we had four.

**KA:** Four? Ok.

**BM:** Four inside and three outside for total seven.

**KA:** Total of seven. What did the outside folks do?

**BM:** They done maintenance on the line.

**KA:** I see, I see. And what was your job when you worked here?

**BM:** Plant Operator.

**KA:** Plant Operator. So you were in charge of the whole functioning of the plant?

**BM:** Yes.

**KA:** Nice.

**BM:** These old pumps, if you were here and a storm came up and you wasn't paying attention, and if power would go off, they had their check valves set low, all your water would run back over here.

**KA:** Was that right? So you had to keep an eye on things and if power went off you had to close valves off I assume.

**BM:** Close these main valves.

**KA:** It was all manually done.

**BM:** ( _____??? Stop water pump???) from the main river and start pump again.

**KA:** I see and did you experience some floods down here as well?

**BM:** Oh yeah.

**KA:** Yeah, what was the most dramatic of the floods and when, if you remember?

**BM:** '73 I think. It was right even with the- it was startin to cover the floor of the office.

**KA:** Was starting to cover the floor of the office. Ok. And what was the upper story used? Now the floor has now been taken out. You said there was alum was stored up there to dump into the settling ponds?

**BM:** That's where we kept all our maintenance.

**KA:** Kept maintenance supplies and so on.

**BM:** Kept our maintenance, kept our chemicals up there.

**KA:** And the stairs were over here?

**BM:** Over there. You had to go up there to add the alum to the water.

**KA:** OK. Excellent. And how did people react when the new building was open and when you all moved?

**BM:** I don't know. They didn't bother, as long as they get water they could care less.

**KA:** Working for the town. Yeah. Well very good, anything else you want to throw in here? Now I am curious to how this cascade system worked? I'm still not quite sure I understand. Did the water cascade over the tops of this structure or did it kind of cascade out through here and become aerated?

**BM:** There was a tray in there.

**KA:** Ok.

**BM:** Just a tray with shelves in it…

**KA:** Uh-huh

**BM:** …and it come in the top of it and gravity fed through it and it went out the bottom.

**KA:** And…

**BM:** And gravity filled.

**KA:** where did the water come up from then? I am trying to figure out where the intake was?

**BM:** Right there.

**KA:** So this is the intake and so it would've brought it up there and then through these series of trays and cascades. Alright. Very good. Alright. That's fantastic. Alright, anything else you want to add?

**BM:** No.

**KA:** Well I sure appreciate your time and for…

**BM:** Wish I could tell you more but there's not much to tell about the old…

**KA:** Are there other folks around who might still be able to share some stories or are they all passed on?

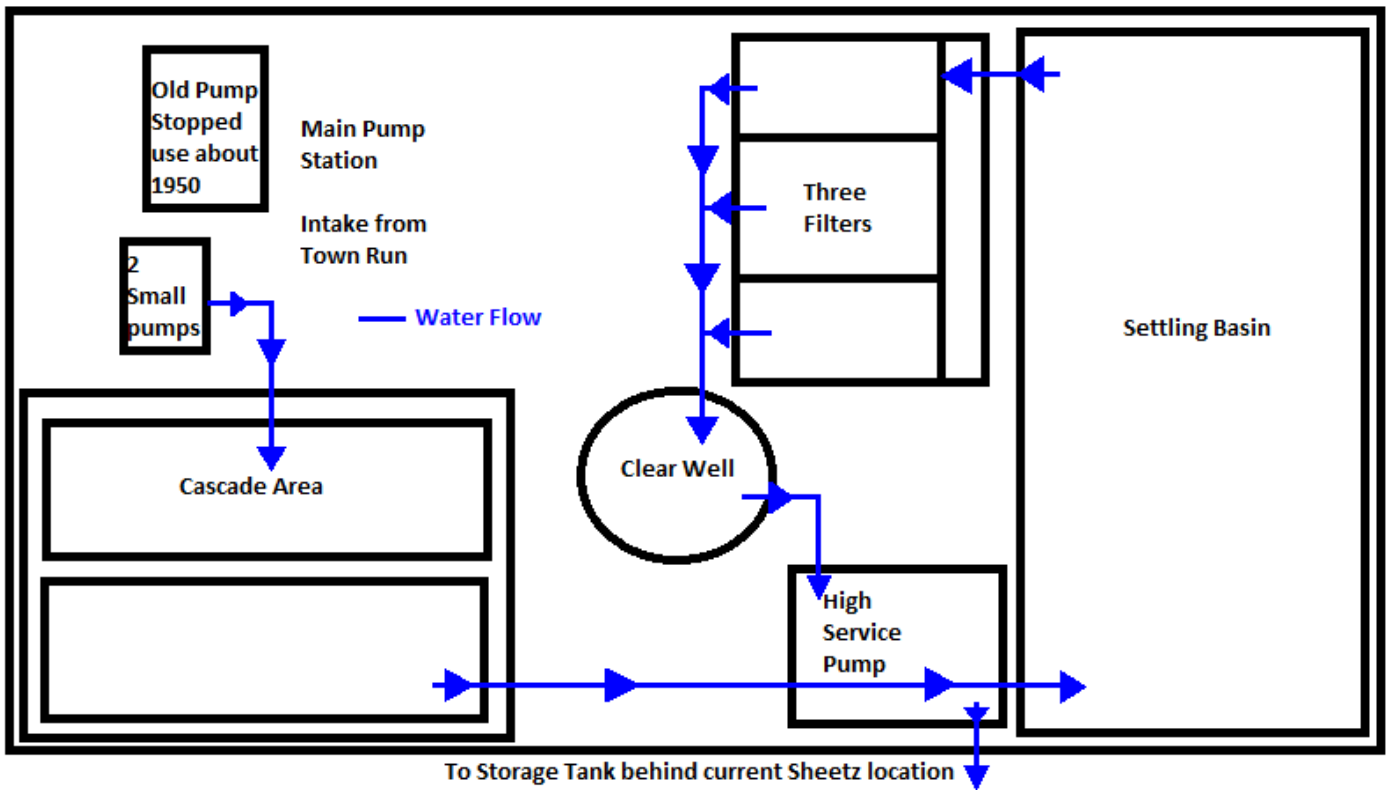
**BM:** Most of them passed on, I'm about the only one left.

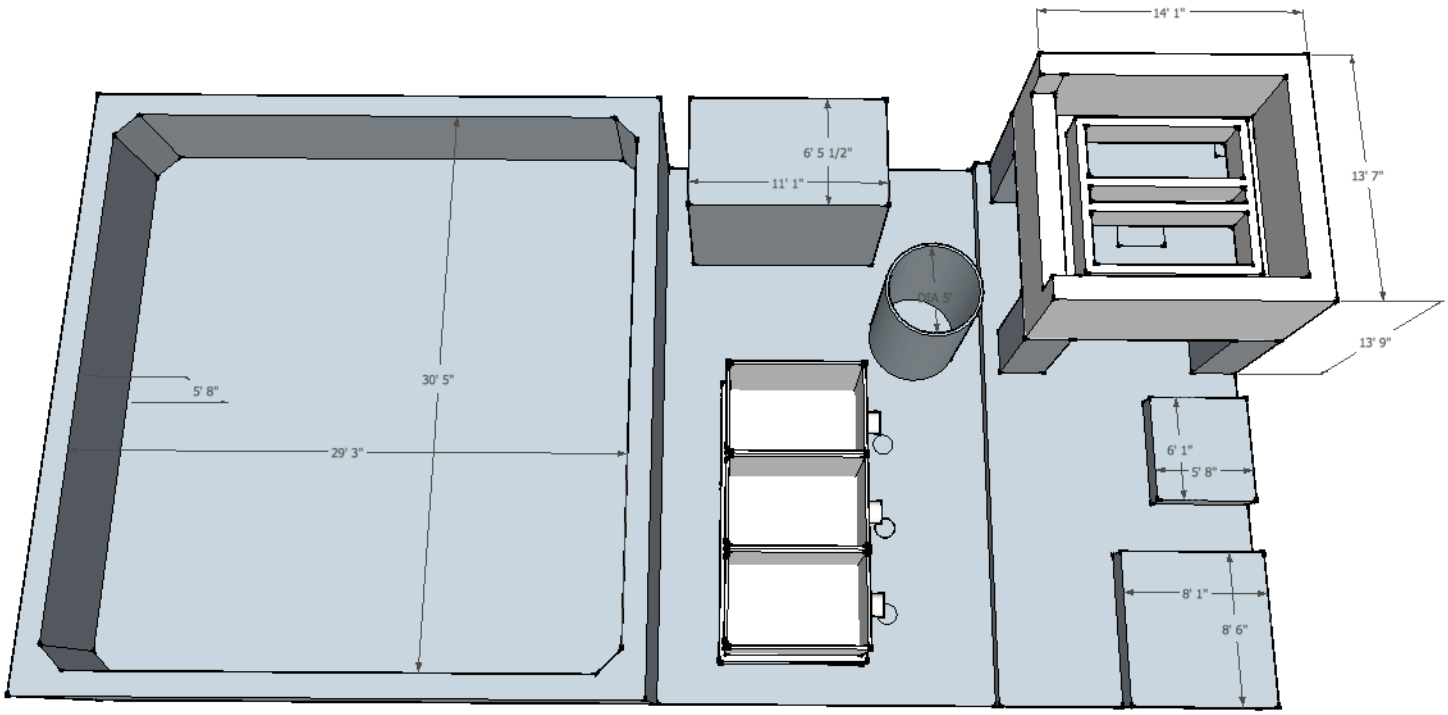
**KA:** Alright.

**BM:** Nobody that worked for the plant anyway.

**KA:** Ok. Well hay, I appreciate your time and thank you.

**BM:** Hope it helps ya.


Old Pump Stopped use about 1950
Main Pump Station
Intake from Town Run
2 Small pumps
Water Flow
Three Filters
Settling Basin
Cascade Area
Clear Well
High Service Pump
To Storage Tank behind current Sheetz location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13' 7"
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13' 9"
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29' 3"
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