A Comprehensive History
Of
The Wastewater Department
For The
City of Coeur d'Alene, Idaho

April 2016

H. Sid Fredrickson
Wastewater Superintendent

Acknowledgements

Since coming to wastewater in 1991, the author has served under the following 5 mayors:

- Ray Stone 1986 – 1994
- Al Hassel 1994 – 1998
- Steve Judy 1998 – 2002
- Sandi Bloem 2002 – 2014
- Steve Widmyer 2014 –

All 5 have been very supportive of all of the city's endeavors, and particularly of the wastewater department. They have all been very good stewards of the environment and of the Spokane River in particular. The city council has shown the same high level of support over the years. Dixie Reid, long standing chair of the city's Public Works Committee, needs special acknowledgement. During her tenure many of the modern changes were affected.

Special thanks go to the staff of the department as well. There have been some recent changes, but all who are, or have, worked for the department in the last 32 years needs a big thank you!

Finally, a Thank You goes to Keith Erickson, the city's past media coordinator, for assisting with the editing.

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CHAPTER I – INTRODUCTION

The beginning of this history began around 1999 when a box of old mosaic photos from 1981 was discovered in the archives. They were taken prior to modern Phase 1 construction of Secondary Clarifier No. 1 in 1982. The photos were taken by Dave Clark then of Brown and Caldwell Engineers. (Appendix "C") They showed the original structures; both from 1939 and from 1973. In 1999, it wasn't realized that there were new structures built in 1973; it was assumed all were from 1939. The author began the plant history at that time. Some 17 years later, it is believed that it is finally complete and accurate.

This history was developed from a variety of sources. Especially helpful are the city council minutes. It is uncertain who actually went through all of the minutes dating back to incorporation in 1887, but they (more than one involved) listed each subject discussed or acted upon alphabetically by year into a number of index books. These indexes list the book and page number of the original minutes for each subject. All of the original handwritten ordinances were transcribed and typewritten sometime in the 1920s. The ordinances were indexed also. These efforts were invaluable to developing the timeline of the department's history.

Also most helpful were the old microfilm copies of the Coeur d'Alene Press (*Press*) at the city's public library. Unfortunately, the film copies only go to about 1950. From then until 2003, only the hardcopies are available. There is no searchable index for either record. The Press only maintains a searchable index from 2003 to the present online. As all of the articles relating to the city's early history of the wastewater treatment plant were front page, it was not an insurmountable effort to search the microfilm. Also used was North Idaho College's Molstead Library for missing copies of the *Press* not at the city's library.

Online searches yielded some articles from the Spokesman-Review. These were helpful in re-establishing the time line of the EPA moratorium in 1981 and the Construct Tech lawsuit in 1994.

Finally, there was the institutional memory. The following long-term employees contributed to what has happened over the years.

Casey Fisher, chief plant operator – July 1984 to present
Dave McKeown, lab supervisor – May 1977 to June 2007
Dave Yadon, planning director – 1976 to 2013
Glenn Shute, field inspector – June 1988 to present
Dave Shults, capital program manager – October 1985 to March 2013
Don Keil, assistant superintendent – October 1991 to present
Sid Fredrickson, superintendent – May 1991 to present

The purposes of this history are multiple folds; to document how we got here, to provide a modicum of entertainment, to preserve some anecdotal stories, and to detail the journey of a very complex utility.

CHAPTER II – COLLECTION SYSTEM

The Early Years 1906 to 1920

The first step of a wastewater utility is to collect it. The health of the residents is always the driver to collect the sewage and remove it. The environment and the health of those downstream have been secondary. "The solution to pollution is dilution" was the norm of the early years of a community. Coeur d'Alene was no different.

On March 9, 1906, the "Special Committee" reported to the Board of Trustees for the Village of Coeur d'Alene their recommendations for sewering the village. (Copy in "Articles" appendix.) The following is verbatim.

> "1st. That they went over a great part of the ground with Mr. Otto Weile, a competent municipal engineer of Spokane.
>
> 2nd. They beg to submit the following recommendations which have met his approval.
>
> (a) That a main sewer be built from the foot of Sherman street on a westerly or northwesterly direction to the river, entering near or above the bridge, as may be most practicable.
>
> (b) That lateral sewers running west along Front or the alley between Front and Sherman, and the same between Coeur d'Alene and Lakeside Avenue be built to run into main.
>
> 3rd. Your committee would state that the approximate cost of main outlet, using 15 inch glazed tile, would be about $12,000 laid. That the 8 inch sewer, laid near Sherman St. would cost approximately $1.75 per foot, and of a 6 inch sewer near Coeur d'Alene Street, about $1.50 per foot.
>
> Your committee would recommend that as soon as practicable Mr. Weile be employed to draft a general sewerage system for the entire village, and its probable additions, and detailed working drawings for each street, with complete specifications, so that work in any portion may be taken up any time. The probable cost of such a general survey and working details will approximate $1000.
>
> In the event of objections being sustained in the courts against the village emptying its sewerage into the river, your committee understand (sic) that erection of a septic tank at or near the outlet would remove such injunction.
>
> Your committee would recommend the division of the village into Sewer districts, and the issue of bonds hereon running for a period of 10 years, to the end that money may be provided for the work, and the payments therefor be extended over a period of 10 years.
>
> The system herein recommended is known as the ***separate system*** (emphasis added); the drainage from the streets in the main being provided for in gutters or separate outlets.

The approximate total cost will be:

For main sewer	$12,500.00
For 4000 ft. 8" sewer	7,000.00
For 4000 ft. 6" sewer	6,000.00
For cost of survey	1,000.00
	$26,500.00
If a septic tank is provided	
It will require	2,500.00
Total	$29,000.00"

(Book 4, Page 295)

By August 9, 1906, the city adopted Ordinance No. 160, creating Local Improvement District No. 1. This created a "local improvement sewerage district". The area to be sewered was increased dramatically from the committee's recommendation. The total cost of the LID was not to exceed $80,000. Ten annual payments were to be made at an interest rate of 8 percent per annum.

This would appear the have been a bold and somewhat risky move by the board (council). The Census lists the population in 1900 as 930, and the 1910 population as 7,300. The May 1907 census estimate was for about 6,000; making CdA a Class 2 city. Assuming lineal growth (which is unlikely) this would put the 1906 population at about 5,275. Not many people for such a sewer system. Coupled with an eight percent interest rate, the board seems to have been way out front. (Today's interest rate for municipal bonds is around 2.5 percent)

Getting the system built was anything but simple and easy. From August 1906 until August 1907, no fewer than 19 articles appeared in the Coeur d'Alene Press. Included were one editorial and one multi-stanza poem by Mayor Scallon. These articles appear as scanned copies in the Articles appendix.

The following is a synopsis of their content along with some speculations based on inference.

August 8, 1906 – It was reported on the passage of Ordinance No. 160 creating LID No. 1.

November 14, 1906 – An anonymous city resident writes the Spokesman-Review informing all that CdA is going to build a sewer system and empty raw sewage into the Spokane River. This riled Spokane city health officer Dr. C V. Genoway to the point that if septic tanks are not built then Spokane should enjoin CdA from doing this project. Spokane's city attorney is uncertain how to proceed.

November 23, 1906 – The mayors of Spokane and CdA meet to discuss the issue. This was reported as a friendly meeting to become informed on the intention of sewering CdA and to discuss meeting with the sewer commission. (Apparently this commission was appointed by the board and power was delegated to make decisions concerning the sewer district under then state law).

November 28, 1906 – Spokane's city attorney informs officials that Spokane cannot have the discharge from CdA into the river prohibited. He cites a US Supreme Court case in which St. Louis, Missouri tried to have Chicago's discharge prohibited. The court found that if Chicago could not discharge raw sewage into a tributary to the Mississippi River then neither could St. Louis.

April 27, 1907 – A law suit is argued in the Idaho Supreme Court. Two of the city's sewer district commissioners sued the city over district assessments. Their claim was the sale of the sewer bonds were an encumbered debt to the city and therefore the debt was unconstitutional as it required a two thirds voter approval. Lewiston, Coeur d'Alene and Boise argued that it was not a municipal debt but an assessment by the district for improvements.

May 6, 1907 – The Idaho court agrees with Boise and Lewiston that the bonds were the obligation of the district; not the city.

May 8, 1907 – The court specifically rules in favor of Coeur d'Alene.

May 14, 1907 – The mayor of CdA wants the "scalps" of the 2 commissioners. He calls for their immediate resignations. His claim is that they are appointees and are subject to removal. (He doesn't get them; apparently the law granted them some autonomy.)

May 14, 1907 – The paper also publishes a 9 stanza parody of a historical romance poem written by Mayor Scallon. It is published on the front page above the fold. It is entitled "The Mayor's First Message."

June 16, 1907 – There was an announcement that the bids would be opened on the following Monday. It was noted that there were many bidders.

June 25, 1907 – It is noted that bids ranged from $59,740 to $84,500. The low bidder, John F. Costello of Spokane, intended to begin by the end of the month.

June 25, 1907 – The new public health officer for Spokane tells the health board that the best option is to explore alternative sources of drinking water such as gravel filters or wells. He doesn't care much for the idea of Spokane paying for septic tanks to be installed on CdA's system and be maintained by Spokane.

June 29, 1907 – The sewer commission announces an inspector for the construction of the new system. (The same commissioners that filed the suit were still there.)

July 1 1907 – A large article announces the city has grown 57 percent in the last year. This rate of growth was based on the increased revenues taken in by the post office. It was announced that at this rate the population would hit 12,500 people in 1908. (The population of the city did not reach 12,000 until 1950.)

> July 13, 1907 – There was much discussion and speculation as to when the assessments would be dated and how payments would be made.
>
> July 23, 1907 – A councilman inquired about the council's control over the sewer project. He was informed that the council had "no more to do with the sewer than the man in the moon."
>
> July 23, 1907 – A newspaper editorial urged not to install septic tanks and not to spend more money than was necessary.
>
> August 20, 1907 – The Sewer Commission discusses extending assessments beyond the district's boundary. They are informed they cannot do that legally.
>
> August 22, 1907 – There was great discussion between city officials and attorneys as to when the interest on the bonds were to begin accruing. This was a result of nearly a one year delay from the passage of the ordinance creating the district.

Further research into the Coeur d'Alene Press archives yielded additional controversy to the point that it is somewhat a wonder that the project was completed. The following articles appeared on the front page.

> November 4, 1907 – Headline: "Sewer System Is Defective." It seems like the main in the alley serving Mr. Chamberlain was 3 feet higher than his basement drain. The article notes that he was … "fortunate to discover the condition before the contractor had left town after completing the work."

From this we can conclude that the project took from late June through early November to complete. Considering at least 42,000 feet of pipe (nearly 8 miles) was installed in little more than 4 months by hand digging is a significant accomplishment.

However, the battle was not over.

> December 9, 1907 – In what amounts to a front page muckraking editorial, the Press publishes a comparison of cost to install the sewer with other communities. Idaho Falls, Boise, Caldwell and even Colfax, Washington were examined. The base cost used for Coeur d'Alene's system used was $80,000; not actual close out costs. The article's conclusion was CdA paid nearly twice as much as the other comparisons; even though digging in CdA was much easier. The other cities paid about $1.00 per foot compared to the $1.90 for CdA. It was noted that Boise residents paid $33 to $44 per lot with 50 feet of frontage; or $0.66 to $0.88 per foot. (More later when the actual costs come in).
>
> December 10, 1907 – Front page letter-to-the-editor from "Citizen" decrying the poor design that did not provide all basements to drain to the new system. The letter appeared "above the fold" in the paper.

December 20, 1907 – It is reported that several residents are considering suing over the amount of the assessments. Sewer Commissioner Williams (Same one that sued the city in 1906.) told the citizens that he expected about $16,000 of the $80,000 to be rebated to the property owners.

December 21, 1907 – In another front page article the reporter notes that Colville, Washington, built a 1,700 foot, 18-inch outfall for $1.00 per foot. It notes that "the Colville contract shows that the (previous) complaints are founded on good grounds."

December 31, 1907 – There was significant disagreement over the power of the sewer commission to continue on after the system was turned over to the city (mayor and council). The commission felt they had the authority to hire and pay for an inspector and maintenance worker for one year. Outside counsel disagreed; citing sections of the law that allowed the creation of a sewer commission.

February 4, 1908 – The final project costs are presented by the sewer commission. They are tabulated as follows:

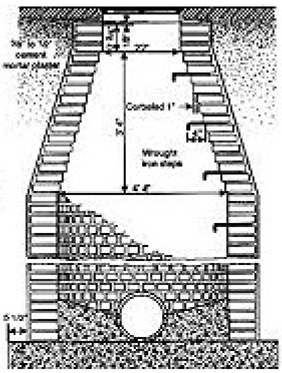
Legal expenses to defend the Blackwell, et al suit	$ 1,753.80
Engineering for Otto Weile	3,880.01
Construction to John F. Costello (Bid was $59,740)	58,630.00
Administration (Publishing, bonds, etc.)	449.75
Attorney	350.00
Commissioners per diem	1,457.75
Total	**$66,521.31**

This left some $13,478.69 from the budget to be rebated to the property owners. Accurate GIS maps of today give the mainline total at just under 36,500 feet of pipe. This leaves some 5,500 feet unaccounted for. The logical assumption is that all of the service laterals are included in the reported total pipe of 42,000 feet. This represents a little over $1.58 per foot. The original estimate presented by the committee to the trustees on March 9, 1906 estimated the costs to be:

8-inch sewer (4,000 feet)	$1.75 per foot
6-inch sewer (4,000 feet)	$1.50 per foot
15 inch sewer main (Assume 4,000 feet) (18 inch actually built)	$3.00 per foot

The original estimate for the 12,000 feet of pipe was $26,500 or $2.21 per foot. Regardless of costs to other communities, the actual expense was considerably under the original estimate on a per foot basis. What is not known when comparing costs with other communities is the depth at which the sewers were laid and proximate distances to adjoining structures. It is noted that depths of the city's project probably average 9 to 10 feet. There are many in the 12 to 14 feet deep range and several in the 20 to 24 feet deep range. Alleys average 16 feet in width. Any existing structures would have to be protected by shoring the trench with wood cribbing. (It was later noted that constructing the 36-inch diameter interceptor in early 1937 required 27,000 board feet of lumber for cribbing; enough to frame 2 houses today).

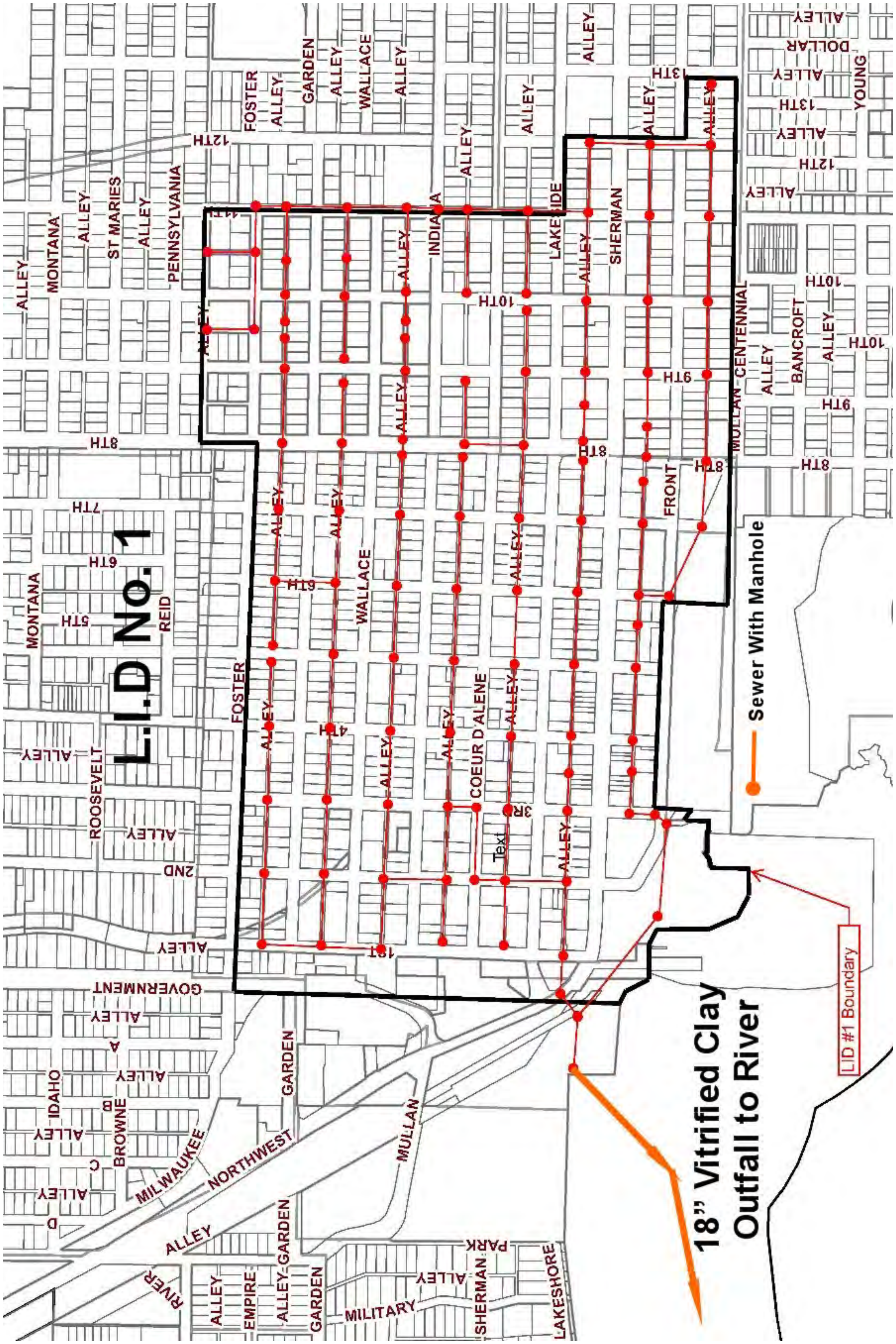
Manholes were constructed at least at each block and where the pipe changed direction. As is still the standard of today, the inside diameter of the barrel at the bottom was four feet in diameter. Manholes were constructed of standard building bricks hand laid and mortared. Bricks were "corbelled" (offset courses) near the top to bring the diameter down to two feet to accommodate the cast-iron ring and cover. The following represents what these manholes looked like. Not counting those on the 18-inch outfall, there were some 114 manholes in the district boundary.



The 18-inch outfall pipe to the river was used for many years. The 36-inch interceptor that is in use today along with its outfall was built in early 1937 and replaced the older 1907, 18-inch outfall.

The following map denotes the boundary of LID No. 1. The sewers and manholes are shown as best as can be ascertained over 100 years later. It is at least 95 percent accurate. Only some of the sewer line in Eleventh Street has some uncertainty.

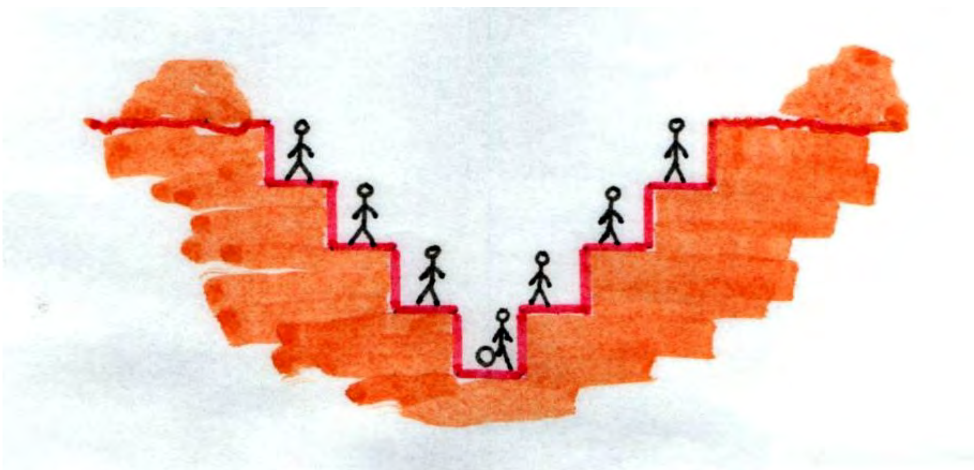
Appendix "A" contains three plan sheets from the US Army Corps of Engineers documents for the flood control dike. The dike was constructed after World War II and was operational in 1946. These 1940 plan sheets show the alignment of the 1907, 18-inch sewer outfall. As noted, the sewer discharged along the river shore on what is now North Idaho College's beach. This pipe was built after the construction of the Post Falls dam, so there was slack water during the summer. There was no outfall pipe taking the sewage out into the main current. One can only imagine the smell on a hot, 90°+ day.



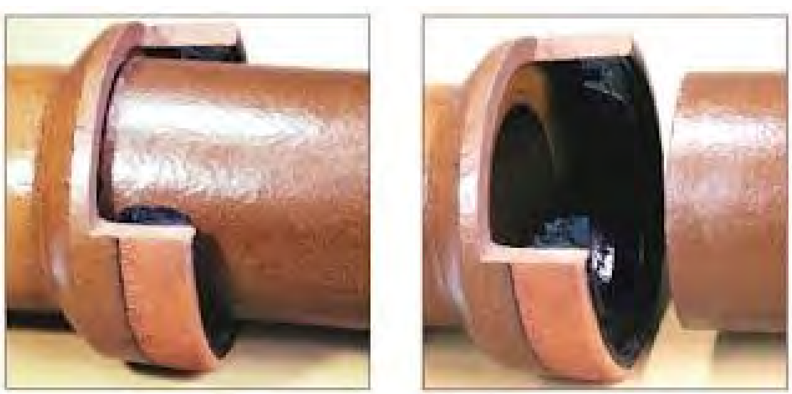
(Prepared By Mike Becker)

Some of these sewers were extremely deep. The designer, Otto Weile, apparently was trying to plan for worse case scenarios and extensions farther to the east. Very few homes, if any, existed where these deep sewers were constructed. For example, in the alley south of Front Avenue and beginning at Eighth Street and proceeding east, the sewer line was in excess of 23 feet deep. When the utility replaced it in circa 2002 it was built 10 feet shallower. There was no need for that depth. The contractor would have had to drive sheet piles on both sides of the alley to prevent homes and garages from collapsing into the trench had it been tried to be laid to the original depth.

Consider how these trenches were dug in 1907. There were no excavators or backhoes. All of these pipes were hand dug. A process of benching was used where there was space. It took a great deal of manpower. The guy at the bottom would take a shovel full of dirt and put it up on a bench 5 feet up. A worker standing on the bench would then hoist it up 5 feet to the next bench, and so on. The following illustration shows what was involved in a 20-foot deep trench.



Each piece of pipe for the 6-inch and 8-inch sections was 2.5 feet long. This meant that each joint had to be hand-mortared to make it water tight. The following shows a typical vitrified clay tile pipe with a modern joint with a rubber gasket. This joint didn't exist in 1907 – it was hand mortared.



Transition Years 1920 to 1990

The city continued to grow. The following is the census data for these years.

Year	Population
1910	7,300
1920	6,500
1930	8,300
1940	10,000
1950	12,180
1960	14,300
1970	16,200
1980	19,900
1990	24,600
2000	35,500
2010	44,100
2014	47,900 Est.

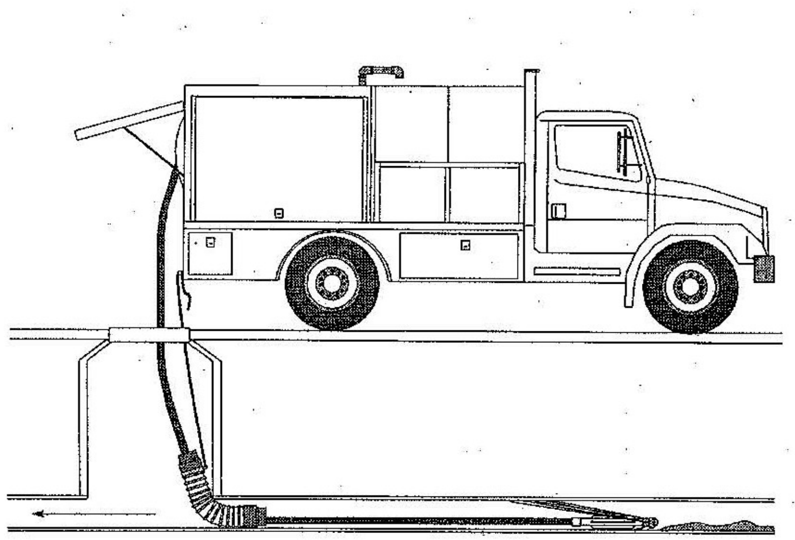
Right after World War I there was a significant population loss.

Vitrified clay tile pipe continued to be used well into the 1920s. After that time, unreinforced concrete pipe began to appear. Cast iron or ductile iron pipe never caught on for use as gravity pipe in the city. By 1970, plastic PVC pipe became the standard.

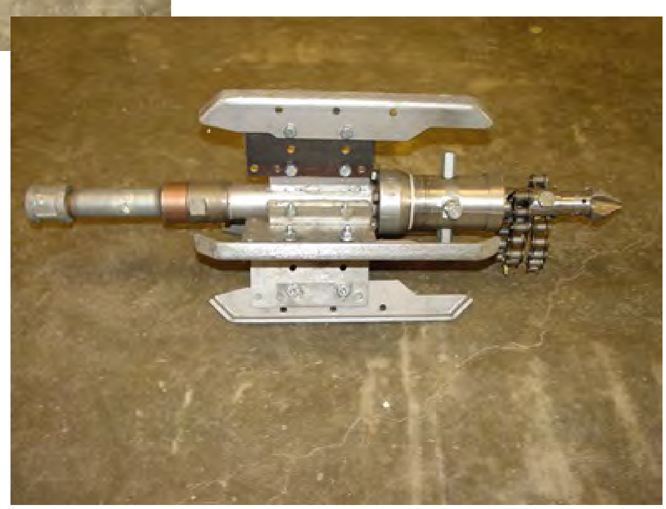
As the street trees in the right-of-ways and on private lots began to mature, root intrusion through the mortared joints became an increasing problem. These roots could become so massive that flow through the pipe would become impaired or completely blocked. This necessitated the purchase of a rod machine for pipe line cleaning and root removal. It is speculated that the city had such a machine either in the 1950s or 1960s. All records from those days are lost.

Typically, the rod is 3/8-inch steel and up to 600 feet long. The rod is inserted into the sewer pipe and rotated by the machine. The unit is fairly effective at cleaning lines. The following shows a rod machine and the tools that fit on the end.

By the late 1970s or early 1980s the city added a jet truck to its cleaning inventory. This machine carried 600 feet of high pressure hose. Various nozzles or even a hydraulic motor could be attached to the hose end. Up to 2000 pounds per square inch (psi) water pressure could be applied to blast debris from inside the pipes. A special hydraulic motor could be used to rotate various root cutters. The following shows the jetting process and root cutting tools.



O'Brien Root Cutter



Motorcycle Chain Root Cutter

By the late 1970s, the city had four lift stations. Neighborhoods that could not drain by gravity had their sewage collected in “wet wells” and then “lifted” by pumps to the nearest gravity line.

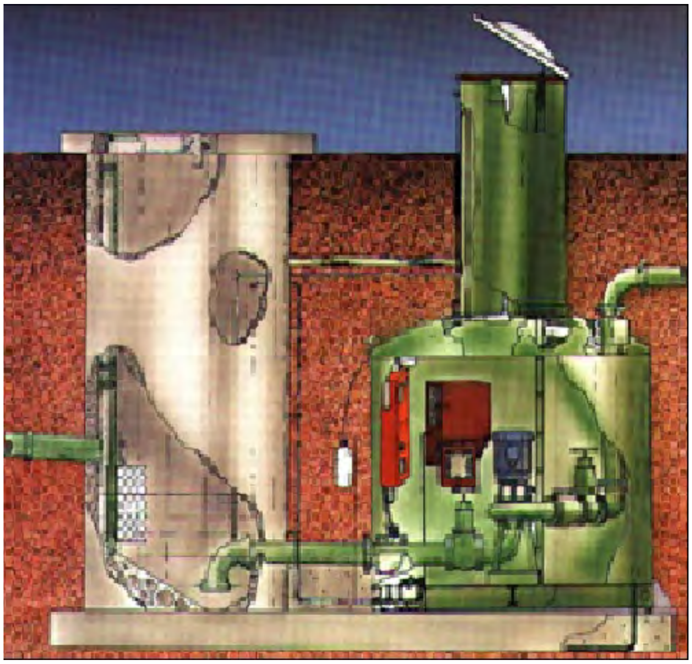
The first lift station believed to have been built was near the exit driveway of the Jewett House at Fifteenth and Ash. This was a wet pit/dry pit design and was actually located in a homeowners front yard due to the vacation of an alley way. The dry pit where the pumps were located was a dank, dark concrete vault with no humidity control. It was accessed through a manhole at ground level. It was numbered as Station No. 2. The force main ran to the west on Ash Avenue to a manhole on Fourteenth Street.

Lift Station No.1 was located at the old Central Premix concrete plant. It, too, was a wet pit/dry pit design. Today this location would be located near the Centennial Trail at the northwest corner of the Riverstone development near the Seltice Road Bridge over the trail. It was a steel prefabricated cylinder accessed by a metal tube with a ladder. Total depth to the bottom of the pump pit was about 25 feet. It contained three pumps. All the flow from the Northwest Quadrant passed through this station. The quadrant was bounded by Kathleen Avenue on the north; I-90 on the south; US-95 on the east and a half mile west of Atlas Road.. It is believed to have been built in the mid-1970s. It was located at the end of the Golf Course Road Interceptor. This station pumped up to a gravity line to the east that eventually flowed southeast down Northwest Boulevard.

Lift Station No. 3 was located at Garden Avenue and 21st. Street. This station was a submersible station that pumped south on 21st Street to about Coeur d’Alene Avenue. Later it was discovered this lift station could be eliminated by replacement with a gravity sewer.

Lift Station No. 4 was located near the intersection of Fernan Lake Road and Fernan Court on the north side of Fernan Lake Road. It also was a prefabricated wet pit/dry pit made of steel and accessed via a ladder in a steel tube. It was made by Smith-Loveless Inc. The discharge force main ran along Fernan Lake Road; west on Sherman Avenue to a manhole in Sherman Avenue is just west of the I-90 overpass.

The following depicts a wet pit/dry pit and submersible lift stations.



Wet Pit/Dry Pit **Submersible**

More Recent Years 1990 – Present

Beginning in 1990, the city received a series of grants from the Idaho Department of Environmental Quality (DEQ) to extend sewer collectors and remove as many septic tanks as possible from over the aquifer. There was considerable concern about nitrate contamination and its effects on child development. These grants covered up to 70 percent of the cost of the main lines, and the laterals to the property line. Eligible costs also included design, construction and engineering construction management. State loans were made available for the non-grant eligible costs. Loan repayment and in some cases capitalization fees were financed by LIDs. Neighborhoods primarily affected were those forcibly annexed during Mayor Jim Fromm's administration in about 1985. Those included Fairway Hills, Indian Meadows, Northshire and Pinegrove Park neighborhoods. The goal was to have 95 percent of the city residents on the sanitary sewer system. Today, it is estimated nearly 99 percent are on. H. Sid Fredrickson wrote the Environmental Information Document for the last septic tank abatement project in late 1995. The project included the Hoffman, Forest Park, Gardendale, Whispering Pines, Sleepy Hollow, Coeur, Pinegrove Park, Sunrise Terrace, and Showboat Additions. The program was completed in 1996. During this program, the Indian Meadows Lift Station was added.

In February or March of 1992, (snow was still on the ground) the collection crew was doing routine maintenance on the Central Premix Lift Station. They tried to close the quarter-turn plug valve on the suction side of one of the pumps. It would not close; something was hung up in it. They pumped the wet well down so one of the crew could enter the wet well and put a pneumatic plug in the inlet line and then inflate the plug. This went smoothly.

Larry Parsons and Glenn Shute then climbed down the access tube into the dry pit. They removed the blocked valve and found a rock in it. They got the rock dislodged and removed and were just re-installing the valve when all hell broke loose. The pneumatic plug ruptured allowing raw wastewater to rush in to the pump room. The two guys made a mad scramble to climb the ladder and get out of the flooding dry pit. In just a matter of minutes the station was flooded; submerging the pumps, motors, and electrical controls.

Even though this was being done in the middle of night when the flows were low, this station had a very small wet well with little reserve capacity. It soon filled and the flow then exited the top of the lowest adjacent manhole. Wastewater flowed down the railroad tracks toward the river. Thankfully, it never made it there.

The only thing that could be done was to mobilize every septic tank pumping truck that could be located and start a "pump and dump" operation. Wastewater would be pumped from the manhole upstream of the wet well into the tankers. They in turn would haul and dump it into a manhole connected to the Northwest Boulevard interceptor where it would flow to the plant. This process continued for 36 hours.

While the pumping operation was going on, the wet well was pumped down and the failed pneumatic plug was removed and replaced with a new one. This allowed the dry pit to be pumped out.

Once the pumps could be accessed, the motors were unbolted and hoisted to the surface. The electrical controls were also brought up. The motors and controls had to be steam cleaned and then taken to Motor Electric where they were baked for 24 hours before they could be re-installed.

Somehow, we got through it all thanks to great cooperation of all of the wastewater crews; both plant and collections. Food and soft drinks were brought to the crews on site during the crisis. Lime was spread on the spill area and the DEQ was notified.

In 1992, the Fernan Lift Station was old and tired. As the Area of City Impact (ACI) extended past the far eastern end of Fernan Lake, the lift station also needed to be upsized. At the time, city policy called for a wet pit/dry pit style if it would serve 50 or more homes.

The city let bids for a self-contained, wet pit/dry pit pump station with a large 10 foot diameter wet well. It would replace the existing one.

The city council received a petition of protest signed by all employees of R. C. Worst Company. Worst was, and is, a vendor for Hydromatic; a brand of submersible pump. It was their contention that the city should not spend the money for an expensive wet pit/dry pit system that was made by the Gorman-Rupp Company. The Gorman-Rupp pump unit was installed in the fall of 1992. The policy has changed and submersible pump stations are accepted. Very little corrective maintenance has been performed on this station in over 20 years.

In 1993, the department replaced the Garden Avenue & 21st Street Lift Station with a gravity collector that runs south on 21st Street to Front Avenue.

In 1997, the 15th Street & Ash Avenue Lift Station was replaced with a submersible pump unit in the public right-of-way. The amount of flow into the wet well was never anticipated to increase significantly as the neighborhood was built out. This allowed the use of a submersible over a wet pit/dry pit.

The sewer maps had not been updated in over 20 years. The old, hand drawn maps not only didn't reflect the new line extensions from new subdivisions, but they contained many errors. What was needed was a new mapping system based on geographical coordinates including accurate depths and elevations. It was necessary to be able to model the system for capacity analysis.

Around 1997, student interns were hired to measure the depths of each pipe entering each of the then over 3600 manholes. They would accurately measure down from the rim to the invert (inside bottom) of each pipe, measure and record the diameters and type of material the pipes were made of as well as manhole material and condition.

As time and money allowed, outside survey firms were hired to accurately map the system using Global Positioning System (GPS) coordinates. Horizontal measurements were to ¼ inch and vertical was to within 1.25 inches of accuracy. This allowed the department to develop a computer model to analyze capacity of the system. This was used to play "what if" questions about the potential impacts of future developments.

By 1999, the basic system was integrated with the city's Geographical Information System (GIS) of map overlays. As time has allowed, the locations of the private lateral taps into the city's mains were added to the maps.

During these same years, the department was negotiating with the railroads to secure licenses or easements to construct a gravity interceptor that would replace the Central Premix Lift Station. The northwest quadrant was growing with new subdivisions and the station was becoming dangerously overloaded.

The Central Premix Lift Station was demolished just after the 24-inch Riverside Interceptor became operational in 1999. It runs from the old lift station to outside of the plant; some 10,000-plus feet.

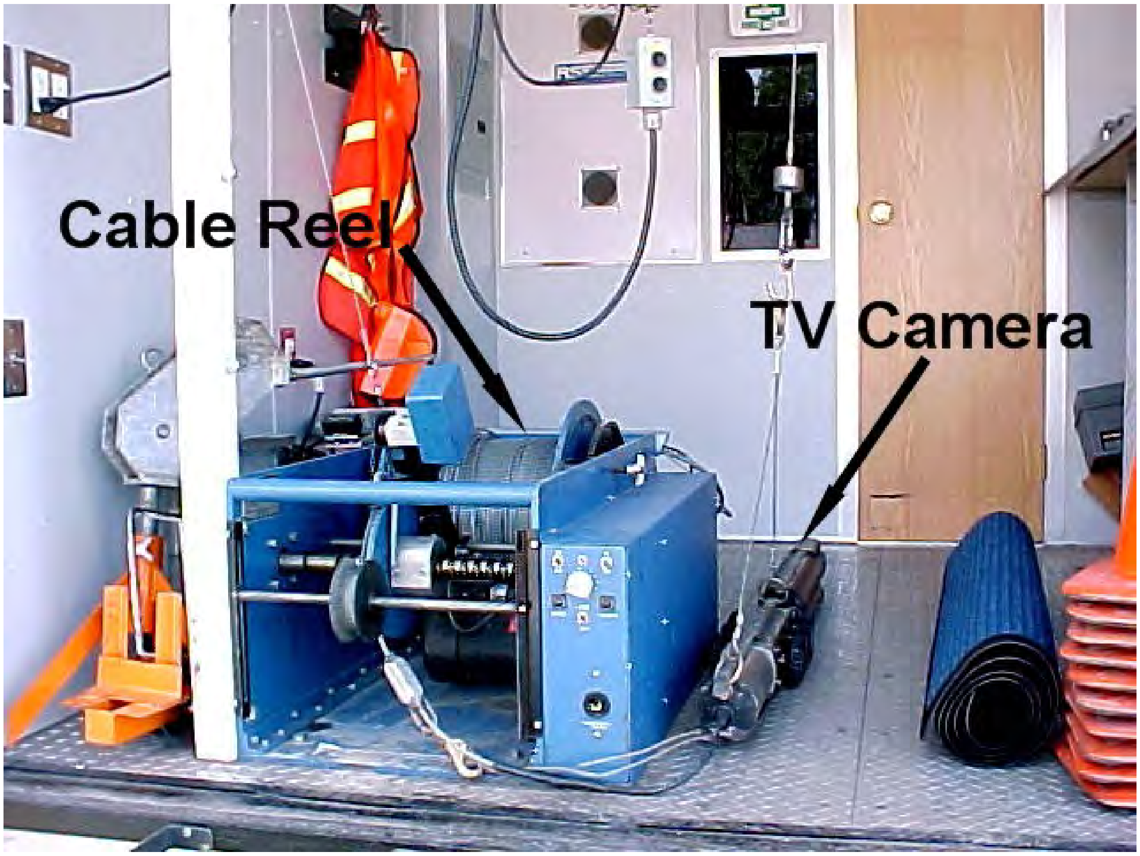
As development continued, so did the need to add developer-donated lift stations. A provision in the Armstrong Park annexation agreement provided that the developer and/or the homeowners association could petition the city to take over the sewer system that included an electrically operated dosing tank just above the Interstate-90 roadway. (Very near the water department's booster station.) While technically not a "lift station" it is on the station inventory. It remained private from 1988 until it was acquired by the city in 1998. The discharge has two pipes – one for redundancy. They run downhill, under I-90 and discharge to a manhole in 23rd. Street.

The following are all of the city's lift stations:

Lift Station	Date Built	Type
Indian Meadows	**1991**	**Submersible**
Fernan	**1992**	**Wet Pit/Dry Pit**
Foothills	**1994**	**Submersible**
Canfield	**1996**	**Submersible**
Woodside	**1996**	**Submersible**
15th & Ash	**1997**	**Submersible**
Armstrong Park	**1998**	**Dosing Siphon**
Cumberland Meadows	**2001**	**Submersible**
Mill River	**2005**	**Submersible**
Riverside	**2006**	**Submersible**
Hawk's Nest	**2008**	**Submersible**

The 2013 Collection System Master Plan by J-U-B Engineers shows the location of all the lift stations and their discharge force main locations.

The Hawk's Nest station has the longest force main. It follows the Prairie Trail from the station half way between Huetter and Atlas Roads to its discharge point where the trail crosses Golf Course Road – about 10,000 feet. Hawk's Nest is also the deepest at about 50 feet. This was due to the Landings subdivision developer's direction to provide each lot with basement drainage. The following photo shows Hawk's Nest Lift Station during construction.



Sometime in the mid-to-late 1980s, the city purchased its first closed circuit TV (CCTV) system that was housed in a delivery-style van. The camera was tethered with a steel cable surrounding the electrical cable. This allowed the collection crew to remotely inspect the condition of the pipes down to 6-inch in diameter. These inspections resulted in prioritizing which pipes needed replacement. The following shows a typical CCTV installation in a van.

With pipe nearing 100-years in age, very short lengths, and many open joints with some root penetration, it was becoming apparent that the department had to get very aggressive with a replacement program and/or rehabilitation projects. Each year since the late 1980s, we had been bidding out open trench replacement projects. These projects were mainly focused on the area encompassed by the boundary of LID No.1 – the heart of the original sewer system.

These projects often were in alleys. Most of these alleys averaged 16 feet in width and contained buried telephone and gas lines as well as overhead power lines. Digging to replace these sewers was, and is, very expensive. In the late 1990s, costs averaged about $130 per foot. Much of the cost was for asphalt replacement if the project was in a street. Dodging other utilities in the alleys resulted in similar cost.

Circa 1992 or ’93, it was discovered there was a major restriction in the 36-inch diameter main interceptor pipe in front of the Hagadone corporate headquarters near the Coeur d’Alene Resort. At the point of restriction a 24-inch storm pipe crossed the 36-inch sanitary interceptor. A conflict of grade was suspected. A contractor was hired to excavate down to the two pipes' crossing point.

A grade conflict proved to have happened. When the 24-inch storm line was installed, its grade ran into the 36-inch sanitary pipe. The solution at this unknown date was to cut the upper third of the 36-inch out; lay the 24-inch through the cut-out; cover the area with an old automobile hood and pour concrete over all of it.

Knowing what the problem was allowed for a proper design to be prepared. That design involved the construction of a storm manhole on both sides of the 36-inch pipe and deep enough to pass under the 36-inch line. A section of 24-inch storm pipe was then laid under the 36-inch connecting the two manholes. This effectively resulted in an inverted siphon on the storm piping.

For many years, there had been a proprietary product for lining old pipes. It involved a fiber glass "sock" that was impregnated with resin. This sock would be inside out – the smooth inside surface on the outside. It would then be blown into the pipe with high pressure air that would turn it right side out. The smooth surface would then face the liquid while the coarse surface would grasp the existing pipe. The high cost of mobilization from California plus the cost for a one-only product made its use prohibitive. This process is commonly referred to as "cured in place pipe" (CIPP) as the fiberglass sock is inflated with high temperature steam and allowed to cure for at least one hour. (Holes for the connecting services lines or laterals would then be cut out with a router and bit connected to a CCTV).

The following photos show the installation of the liner and what a piece of the liner looks like after curing.

The wastewater department was completely reorganized in 1991. The details of that reorganization are covered under the following section on the treatment plant.

John Daley was hired in 1991 as the utility's project manager for collection system projects. He had worked for the city's engineering division for many years prior. (John retired in 2004, but stayed on for a few months as a contractor.)

In 2004, the first Cured-In-Place-Pipe project was bid. The project was developed in conjunction with J-U-B Engineering and our collection operators. Extensive jet cleaning and TV-ing had to be done to identify candidate sections for lining. Planned Engineered Construction (PEC) of Helena, Montana, was the successful bidder. Around 10,000 lineal feet of pipe were lined for an average unit cost of $29 per foot. (This is compared to $130 per foot for open trench replacement). This has become an integral part of our $700,000 annual capital improvement program of rehabilitation and replacement.

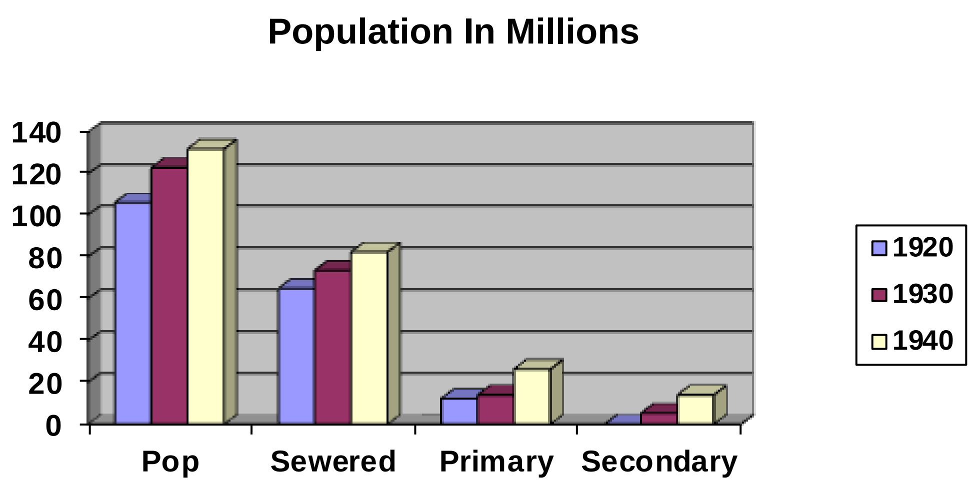
A detailed comprehensive master plan for the collection system was completed in 2013. This effort includes extensive capacity analysis to reveal potential future bottlenecks that will require mitigation. It is interesting to note that the system has just less than 210 miles of pipe and some 4,400 manholes.

CHAPTER III – TREATMENT PLANT

The Early Years 1937 to 1940

Although there were secondary treatment plants; both trickling filters and activated sludge, as early as 1901, centralized treatment didn't really take off until the 1920s. Primary treatment was the norm well into the 1940s and 50s. Primary treatment typically involves sedimentation by gravity in tanks called clarifiers. This form of treatment does nothing to remove the finely suspended (colloidal) solids or the dissolved solids. Secondary treatment utilizes biological growth – mainly bacteria – to convert these remaining organics into their own biomass, which is more easily removed from the liquid stream by settling. Secondary treatment typically uses a fixed media, like plastic; or suspended growth media. In the fixed film the biomass grows on a media such as rocks or plastic. Suspended growth media is also called activated sludge where the biomass is suspended in aerated liquid media called "mixed liquor".

The following chart indicates the population of the US and the approximate numbers served by sewers for the period of 1920 to 1940. (Source: US Census & Water Environment Federation MOP 8).



The Coeur d'Alene wastewater treatment plant was first commissioned in 1939. It was initially a secondary plant. The primary portion consisted of headworks with screening and disinfection with chlorine; and a flocculator followed by a single primary clarifier. The secondary portion consisted of a rock-media trickling filter followed by a secondary clarifier. The final effluent was not initially chlorinated for disinfection before being discharged to the Spokane River through an open pipe that ended about 200 feet from shore. There was separate grit removal in the flocculator. There was a natural or digester gas fired incinerator to dispose of the screenings. Primary and secondary sludge was sent to two digesters; first to a primary and then into the secondary. Digested sludge then went to sludge-drying beds. Final biosolids (sludge) disposal was achieved by making the product available to the citizens and land application on city property.

Research into news articles in the Coeur d'Alene Press revealed the following chronology of events:

January 9, 1937 – It is announced that the 36-inch “trunk” sewer (interceptor) would begin construction on Monday, January 11, 1937. The pipe is to run from First Street and Sherman Avenue to where the old outfall is today. (It is now a stormwater outfall.) Length is 4,280 feet at a cost of about $4.10 per foot. Total Cost is to be $68,742 with $60,344 coming from the Works Projects Administration. Also included were 27,000 board-feet of lumber for cribbing to protect the workers.

June 21, 1938 – The federal Public Works Administration tells the city that it will not approve funding for the “East End Sewer” unless the city commits to a “sewage disposal plant.”

August 4, 1938 – Council votes unanimously to award a contract to L. R. Stockman of Baker, Oregon, for the following services: “Field inspection of the site, consultation with the Idaho State Sanitary Engineer, office studies, estimate (breakdown) of cost, preliminary plans, furnishing six counterparts of the report, estimate of cost and preliminary plans and assisting the City in preparation of the application to the Public Works Administration for funds to aid in the financing of the cost of the project.”

August 9, 1938 – Highland Park Grange urges the city to build a plant; providing relief for 40 to 50 families along the river – where they got their drinking water. (It is speculated that the grange was on the south side of the river.)

September 6, 1938 – Letter published from mayor explaining the need for a treatment plant. (Or a “waste disposal plant” as it was referred to in those days.)

September 9, 1938 – Post Falls petitions city to build a plant.

September 10, 1938 – The state chemist urges the city to build a plant.

September 28, 1938 – Bond to build the plant passes 688 to 180 to raise $77,000 for the city’s 55 percent share. Total estimated cost is $140,000.

October 17, 1938 – Council unanimously passes a resolution accepting a grant for 45 percent and not to exceed $63,225.00 to aid in the construction of the plant. This translates to a total plant cost in the range of $140,500. The plant is to be built for a population of 15,000.

December 5, 1938 – Bid awarded to B. H. Sheldon of Spokane for a total of $115,552.

April 8, 1939 – Plant reported nearly done.

June 9, 1939 – Engineer and council inspect and test plant.

July 19, 1939 – The city waits for final certification of plant.

August 1, 1939 – City receives final plant certification.

October 15, 1939 – Final performance testing of the plant completed.

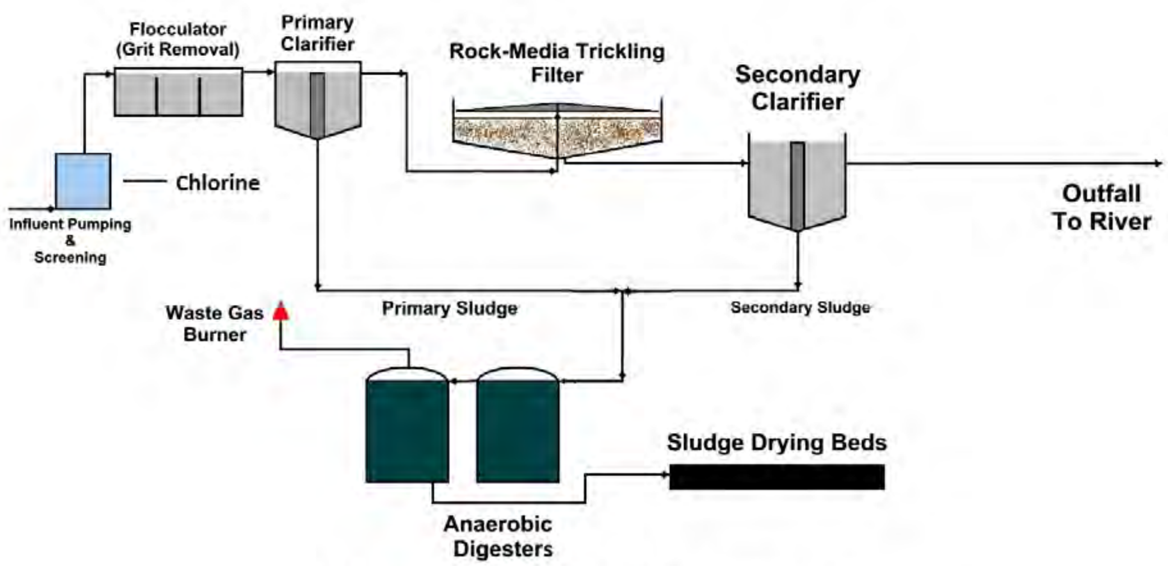
October 17, 1939 – James Ingalls was selected as plant operator. (This was the grandfather of Jon Ingalls, former deputy city administrator.)

April 6, 1940 – City council approves the East End Sewer.

The history indicates that the city's facility may have been the very first secondary plant in the Northwest. It is believed the decision to build a secondary plant was as much to gather data and test performance of this relatively new technology as it was to clean up the river. From roughly the first of May 1939 through October 1939 is a fairly long time to test and optimize any secondary plant – then or now.

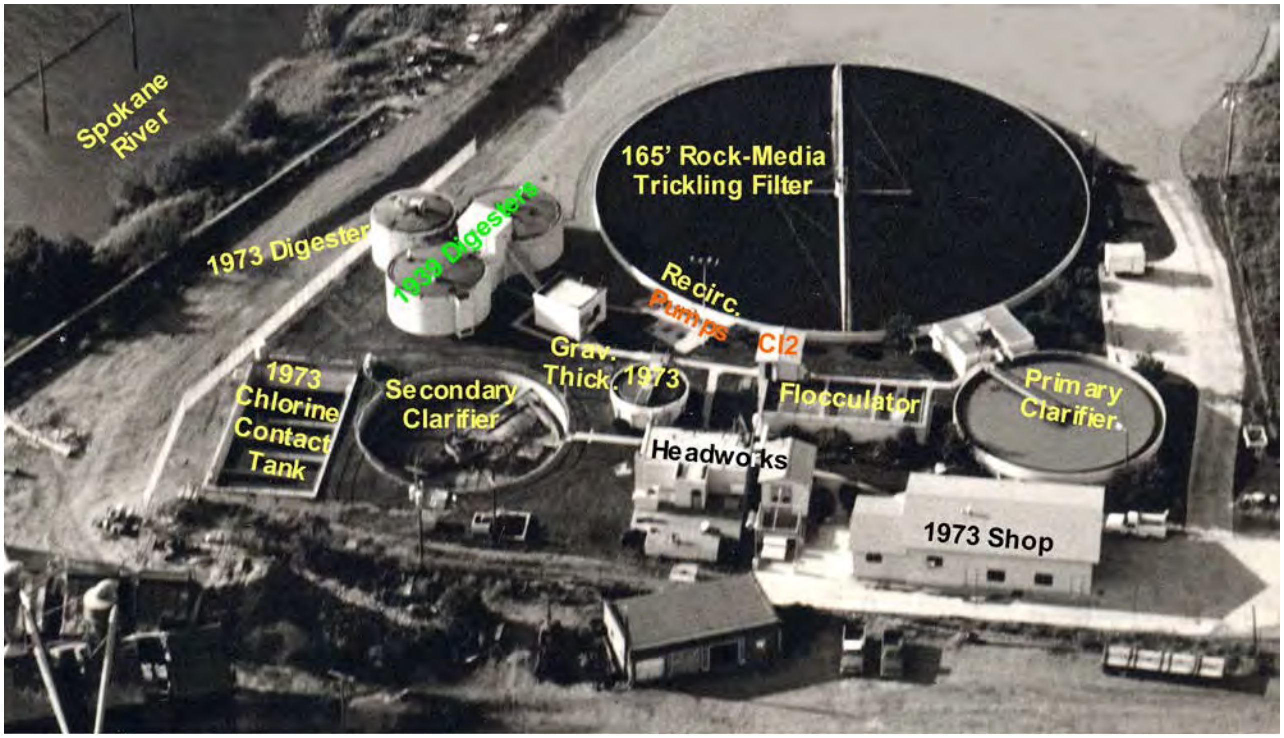
The population of Coeur d'Alene in the 1940 census was right at 10,000. Certainly economic conditions in the city and county likely prompted the federal Public Works Administration to offer the grant to the city. As can be noted in the above graph, of the 82.3 million people that were on sewer in 1940, only 17 percent were served by secondary treatment. Most of the communities with secondary treatment were greater than 50,000 in size. This certainly makes Coeur d'Alene very unique in the country.

The plant profile is shown below.



Coeur d'Alene's Secondary Wastewater Treatment Plant - 1939

The following photo shows the original plant structures and those added in 1973.



Transition Years 1940 – 1967

A search of the index to the city council minutes from 1940 to 1967 showed no activity regards to the treatment plant. A payroll ledger entry was found for a "sewer worker" covering February 1943. He was paid $39 for the month. The only withholding noted was for $0.75 for "victory tax". The first mention was the bond election as noted below. Apparently everything was running fairly smoothly.

More Recent Years 1967 – Present

In 1967, certain processes were aging and being overloaded. In November, voters were asked to pass a bond for $550,000. It was rejected, having only received 44 percent approval of the needed 67 percent.

In 1971, voters were again asked for approval. This time the project would cost nearly $2 million, with only $400,000 needed in bonds from the city, grants funded the remaining amount. This decision passed with 86.6 percent approval. Construction started in 1972 and was completed in 1973.

This project had the following major components:

- New anaerobic digester
- New chlorine contact tank
- Rehab and restoration of the hydraulic capacity to the rock media trickling filter

- Addition of recirculation pumps
- Improvements to the clarifiers
- Converting flocculation tank to pre-aeration/grit removal
- New gravity thickener
- Shop and lab improvements
- Miscellaneous equipment replacements

During the spring of 1973, the entire plant was being bypassed, i.e., there was no treatment at all. Please note in the photo the plume of the discharge along the east bank of the river. (Photo is courtesy of North Idaho Museum.)

As noted in the Oct. 17, 1938, news article, the original design population was for 15,000. The table below shows the more recent census data for the city.

Year	Population
1970	16,200
1980	19,900
1990	24,600
2000	35,500
2010	44,100
2014	47,900 Est.

In both 1970 and 1980, about 2,400 of the population were still on septic tanks. The septic tank abatement projects of from about 1990 to 1996 corrected many of these. The goal was to have 95 percent of the city on the sewer system.

Around 1975, the design capacity was exceeded. The 1972-73 project added some capacity, but it was minimal as no additional trickling filter media was added. Therefore, no additional secondary treatment capacity was significantly added to the plant. The photo below (D. Clark – 1981) shows the chlorine contact basin and new digester (left, back) completed in 1973. Please note the fireplace and chimney in right background. Screenings (rags) from the bar screen were burned on-site. (It must have been pleasant to be down wind.)

Southwest Plant Corner
1981

Dave McKeown began work as the department's laboratory supervisor in late May 1977 (he retired in 2007.). Joe Scales was the superintendent at that time.

Part of the city's discharge permit is the requirement that test results of what's coming in and what is going out be reported to the EPA each month. These reports are known as "Discharge Monitoring Reports" (DMRs). Part of the 1972 federal Clean Water Act is the provision that any willful violation or falsification of the records will be treated as a federal felony with up to 25 years in a federal prison.

Before April 1979, the Idaho Division of Environment Quality (DEQ) conducted an analysis of the plant and concluded that the plant had reached its loading capacity (The DEQ is now a department.). This led to a sewer hook-up moratorium pending further "significant expansion of the Coeur d'Alene sewage collection system." (Spokesman-Review, April 22, 1979). On May 1, 1979, the city council lifted the moratorium based on a similar case in Ketchum in which the courts found that the city "was legally obligated to provide the continuation of such service to its citizens." (Michael Christie – DEQ, April 19, 1979. See also council minutes and letter – Appendix "B".)

This now is where the memory of both Dave Yadon (former planning director) and Dave McKeown gets a little fuzzy. While the exact timeline is uncertain, both agree on the central facts. It appears that sometime in 1978 Dave McKeown found that the superintendent, Joe Scales, was falsifying the records; particularly the monthly DMRs. McKeown tells that he reported this to the then mayor, Don Johnston. McKeown then notes that the next thing he knew there was an FBI agent in his lab. Mr. Scales was allowed to continue with the city for about 6 months according to McKeown. McKeown reports that he pled guilty in federal court and received probation. There is no mention of any of this in the council minutes.

On May 3, 1979, a new wastewater superintendent began work. Tom Liston was a retired Navy chief and combat aircraft controller who attended a wastewater operator school in Missouri. He stayed with the city until his retirement in March 1991.

June 1, 1979, the council adopted the first capitalization (Cap) fees to help fund expansion needs of the utility.

On November 7, 1979, the city council approved the mayor's appointees to the *"Wastewater Treatment Technical Committee."* Members included Larry Belmont (Panhandle Health District director), ***Joe Scales*** (ex-wastewater superintendent), Dave Yadon (city planner)' Paul Prety and Dave Finkel. Dave Yadon retired as the planning director in the fall of 2013 and a conversation with him in March 2014 revealed that he is uncertain about the timeline regarding what happened all those years ago.

The "Committee" met on January 17, 1980

By this time the city was gearing up to expand the plant's capacity. The city hired Brown and Caldwell Engineering out of Seattle in May 1979 to begin the necessary planning process which included:

- Stormwater separation project in the Fort Grounds
- Infiltration and inflow study to determine how much stormwater (inflow) was entering the sanitary sewer system and how much groundwater (infiltration) was entering the collection system
- Prepare a Facility Plan – a guideline and plan for 20 years of future projects at the plant
- Prepare an Environmental Impact Statement (EIS)

Some of the council milestones include:

February 5, 1980 – Council accepts Inflow/Infiltration study.

March 18, 1980 – Council adopts new sewer rates.

May 6, 1980 – State DEQ commends wastewater laboratory.

November 4, 1980 – Council accepts Committee report concerning the progress of the Facility Plan.

December 2, 1980 – Council is told the plans for the plant may have to be scaled back due to lack of federal funds.

May 5, 1981 – Council imposed a moratorium on new sewer hookups after the EPA threatens $10,000 per day fines.

June 2, 1981 – Council hears interim report from Brown and Caldwell.

July 21, 1981 – Council accepts Facility Plan.

December 1, 1981 – City awaits final approval to go to bid.

January 1982 – The EPA issues Final Environmental Impact Statement.

June 2, 1982 – Council lifts moratorium and awards bid for Phase 1 (Secondary Clarifier No. 1) to Contractors Northwest Inc.

Thus begins the modern era of "phased" construction projects. Over the past 34 years, there have been many drivers; population growth and regulatory change are the main ones. The following table is the current list.

Project	*Year*	*Cost ($ Millions)*
Phase 1 – Secondary Clarifier	1982-83	$ 1.0
Phase 2 – Solids Contact, Digester & De-watering	1984-86	$ 4.4
Phase 2A – Admin. Bldg. & Laboratory	1986-87	$ 0.3
Phase 3A – Primary Clarifier & Chlorine Contact	1987-88	$ 3.4
Compost Facility	1988-89	$ 4.0
Phase 3B – Raw Sewage Pumping, Pre-aeration/Grit, Sludge Thickening & De-chlorination	1988-90	$ 3.4
Compost Improvements	1992-94	$ 1.6
Phase 3C – Phosphorus Control, Trickling Filters, Digester & De-watering	1991-95	$ 12.0
Odor Control	1999-00	$ 1.2
Phase 4A – Improve Disinfection Control, Aeration & Stormwater Control	2001-03	$ 0.8
Phase 4B – New Headworks, Solids Centrifuge, Electrical Entrance & Clarifier Covers	2005-07	$ 15.0
New Digester #2 Cover & Sec. Clarifier #1 Coating	2008-2009	$ 1.0
Phase 5A – IFAS Ammonia Control & Solids	2008-09	$ 0.6
Pilot Project For Low Phosphorus	2009-11	$ 3.8
Phase 5B – Admin./Lab, Digester w/Control Bldg.	2010-11	$ 16.0
Phase 5C.1 – Partial Tertiary Treatment to 1 mgd	2013-14	$ 12.4
Phase 5C-2 – Tertiary Membranes to 5 mgd	2016-17	$ 20
TOTAL		**$100.9**

By 1981, a junior engineer out of Brown and Caldwell's Seattle office was on the scene. Dave Clark took a number of photo mosaics prior to the 1982 construction season. One of them is on Page 25. The rest are part of Appendix "C". He also scrambled up on a pile of chips at the De Armand stud mill next door to capture what our outfall looked like. (This was the original 1937 outfall). Dave is now a senior vice president with HDR Engineering and is still leading the planning efforts for the city's utility.

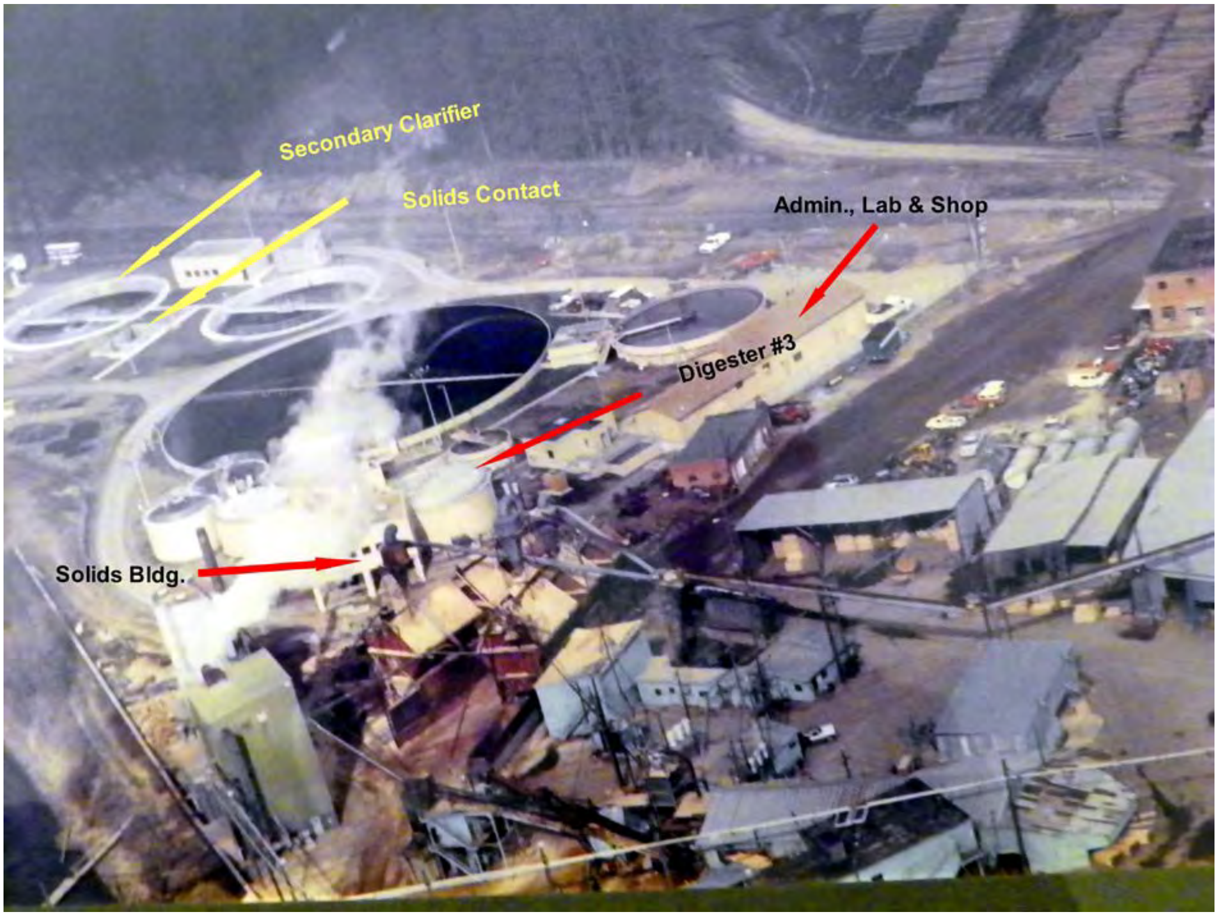
It is obvious why the EPA was threatening fines. There were, and still are, residents that draw their drinking water from the Spokane River downstream of the plant's outfall. Average daily dry-weather flow for 1981 was 1.92 million gallons per day (mgd). In 1982, discharge had increased to 2.1 mgd. The primary driver for Phase 1 was to lift the moratorium on new connections.

The following photo was taken in July 1983 following the completion of Phase 1. This project resulted in a new secondary clarifier of about 3 mgd capacity. This produced an effluent that met the permit conditions. Note that the old original secondary clarifier was out of service.

Phase 2 came shortly after with construction beginning in 1984. Elements included a new gas-mixed digester, solids control building with belt filter press for de-watering the digested sludge, conversion of one of the original digesters into a sludge storage tank, secondary clarifier No. 2, and a small solids contact basin with fine-bubble air diffusers.

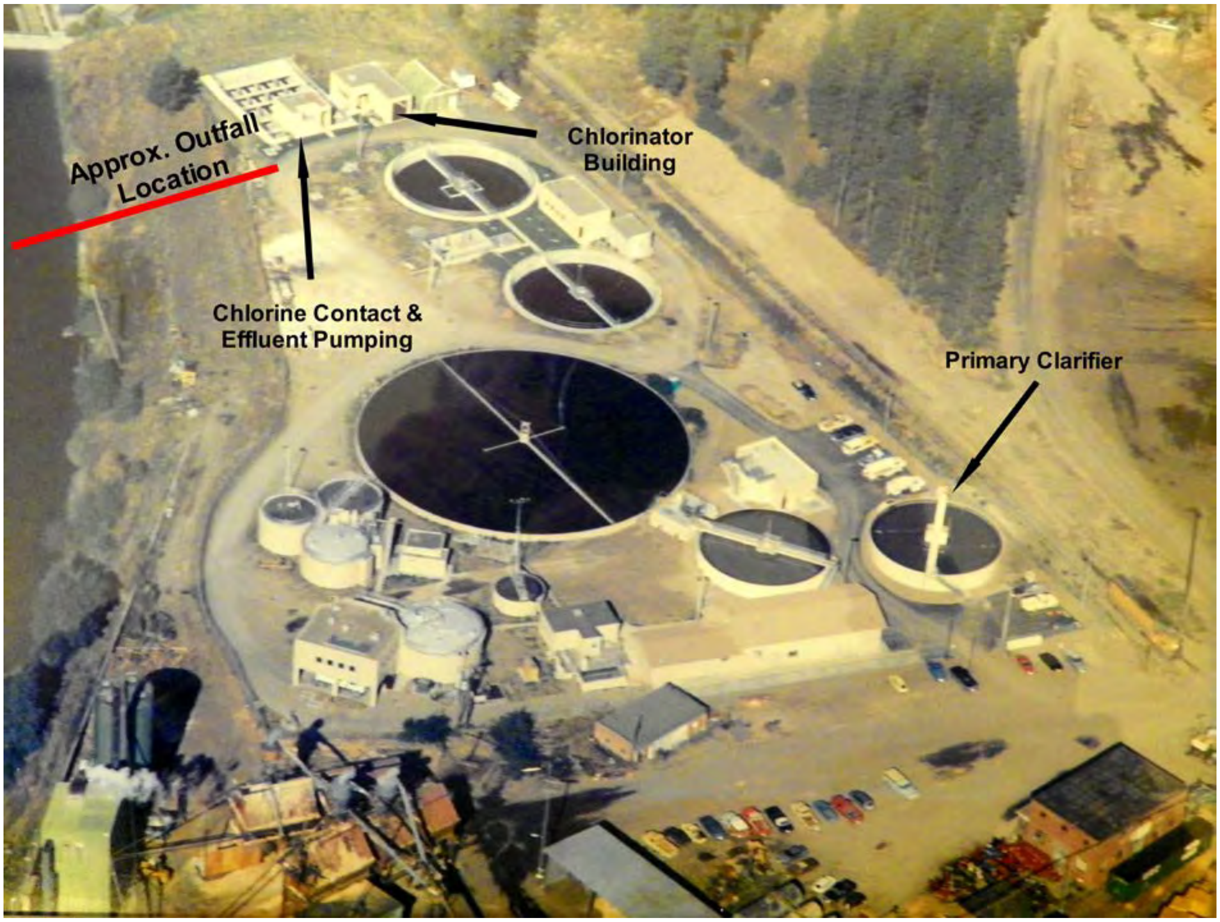
Dave Shults came to work for the utility in August 1986 as the project coordinator. He answered directly to the public works director. His primary duties were to manage the consultant contracts and all of the requirements on the state's grant and loan program. His position eventually was re-classified to capital program manager. He served in this capacity until he retired in March 2013.

The following picture identifies the major elements of Phase 2. Phase 2A was for a complete remodel of the administration building, lab and garage/shop. As this was a wood frame building, costs were kept to a minimum. The photo below also identifies Phase 2A.



Phase 3A added a second primary clarifier, chlorine contact tank, a new 36” outfall with 10 diffusers and an effluent pump station that afforded enough head to push the effluent through the outfall pipe during high water or full summer pool. Each diffuser resembles an oversized traffic cone with a top opening of about 5- inches. The outfall was actually trenched into the river bottom with the diffusers flush with the bottom or protruding slightly above. During calm winds, the riffles produced by each diffuser are visible both from shore or a boat. The project lasted during the construction seasons of 1987 and ’88.

Phase 3A photo showing the major components to the plant is below.



Phase 3B came next in 1988. It was completed in 1990. Main components included grit removal/pre-aeration; gravity thickeners and influent pumping improvements. The following photo denotes the major parts of the project.

In March 1991, wastewater superintendent Tom Liston and chief operator Roland Hall retired on the same day. Liston refused to take control of the new compost facility unless he was paid extra. Project coordinator Dave Shults and Liston both reported directly to public works director Rodger Lewerenz. After the retirements, it was decided to recruit a new superintendent and to reorganize the division (not yet a department). Shortly before the division was reorganized, office space on Coeur d'Alene Avenue and Fifth Street was leased. This housed an office for Shults and the pretreatment coordinator, Russ Helgeson, along with the division's administrative assistant. There was also a small conference room.

In May 1991, current superintendent Sid Fredrickson accepted the position, leaving the street division as its superintendent, a position he held since November 1986. All functions of wastewater were placed under his supervision including compost, capital projects and pretreatment. (The pretreatment program is mandated by the EPA in which commercial customers discharging other than domestic sewage are permitted and tested for compliance to city ordinances.) Casey Fisher was promoted to chief operator and Don Keil was hired as the assistant superintendent in October 1991. Casey had begun working at the plant in July 1984, so he knew about all the construction of Phases 2 and 3. Don had a degree in microbiology and 10 years' experience as the chief operator in Bozeman, Montana. This is the exact organizational structure that exists today. (See organizational chart in Appendix "D".)

In late 1991, the city purchased the Harbor Center property along the river. The main building housed the recently closed Osprey Restaurant and mixed offices. The property went into receivership following the bankruptcy of the original developer. The city paid about $3.1 million for the building and adjoining six acres of land.

The Phase 3C contractor began in the fall of 1991. Major components included two new plastic media trickling filters; pump station for trickling filter feed pumps and recirculation pumps; solids re-aeration/solids contact tankage; digester No. 4 and a new 1.5 meter belt filter press for solids de-watering. The latter was housed in the solids building and the original one meter press was saved in reserve. Brown and Caldwell Engineers (B & C) continued as the utility's engineer. Dave Clark was still the engineering team leader for B & C. The contractor was Construct Tech out of Utah and was owned by Dennis Goggin.

The following photo shows the main components of Phase 3C.

By late fall of 1991, it became evident that this contractor was causing major problems. The work, especially the concrete, was unbelievably shoddy to the point of being unacceptably defective. In December of 1991, the contractor picked up a full 350 gallon propane tank with a fork lift. As it wasn't tied down, it fell off hitting the ground and rupturing the main valve. Thankfully it did not ignite. Fredrickson notified the Occupational Safety and Health Administration (OSHA) and Construct Tech was fined. Defective work notices continued to be issued. A total of 44 were issued by B & C.

In early June 1992, it was discovered that the contractor did not have a valid Idaho Public Works license. Idaho law stated that if a firm allowed their license to lapse, they had to wait one year to re-apply. Somehow Goggin got the licensing board to meet telephonically and reinstated his license. In late June the council voted to terminate his contract. He had already missed four of the eight milestones. Because the project was partially funded by a federal grant, Construct Tech filed suit against the city in federal district court in late July 1992.

In the meantime the city paid B & C to re-package the project for rebidding. The city also had to assume vendor contracts Construct Tech had because of federal procurement regulations. The city also hired B & C to provide additional engineering support to assist Goggin with the submittal process in hopes it would help the contractor to get back on schedule. This latter effort cost about $16,000 a month over the budget. The city hired a private security firm to patrol the perimeter of the plant for over a year. When combined with the ongoing legal fees, the city was out nearly $2 million.

By the second quarter of 1993, the project was rebid and awarded to Ellsworth-Peck Inc. also of Utah. Construction soon resumed. The contractor turned out to be very good.

The two week trial began in Spokane around the last half of May 1994 at the federal courthouse. It was a jury trial. It cost the city nearly $2 million to get to the courthouse steps. The contractor's attorneys were able to successfully argue the work was not defective, only incomplete. They also successfully argued that evidence existed that the city was out to get him from day one. Goggin was asking for just under $3 million in damages including destruction of business. The jury agreed. So, it cost the city another $3 million to get out of the courthouse. In October 1995, the Ninth Circuit Court of Appeals agreed with the jury. It was game, set, and match; despite the 44 defective work notices on record.

Total cost for Phase 3C was right at $12 million. The final project was online in 1995.

With the completion of Phase 3C all of the anticipated elements of the 1981 Facility Plan were now in place. We thought we were good for 20 years and a maximum flow of 6 million gallons per day (mgd). Wrong-O!

In 1994, the Idaho Division of Environmental Quality (DEQ) released a draft of a "Phased Approach for a Phosphorus Total Maximum Daily Load (TMDL). This TMDL would dramatically restrict the amount of phosphorus in our discharge. The results would cost us tens of millions of dollars. The science behind this document was spurious, at best. Fredrickson sought comments from eminent scientists, professors and engineers. Following the submittal of these refuting comments, the author left the DEQ and the matter faded into the sunset.

The Spokane River Association challenged the city's 1989-issued discharge permit in federal court. The basis of the complaint was the permit did not take into account the potential accumulative effects of the three Idaho discharges on the Spokane River. The judge agreed and ordered the permit to be remanded to the EPA or further consideration. The city appealed the decision to the Ninth Circuit Court of Appeals. Circa 1992 the appellate court agreed and ordered the permit remanded to the EPA for reconsideration. They did not vacate the permit, leaving the conditions and limits intact. The city ended further appeals.

Discussions began with the DEQ to explore what could be done to address the issue of "accumulative effects." The DEQ was able to offer a grant to a consortium of the dischargers. This led to the loosely knit organization known as the "*Kootenai Regional Wastewater Coordinating Committee"* or KCWCC (pronounced "Kerr-wick).

There were two arms created; a technical arm chaired by Fredrickson; and an elected officials arm chaired by CdA mayor Al Hassell. Members included CdA, Post Falls, Rathdrum, Hayden, Hayden Lake, Kootenai County, the DEQ, and the Panhandle Health District. There were both technical and elected representatives.

In May 1994, the DEQ was able to come up with about $250,000 as a grant to fund the preparation of a regional facility plan and an accompanying Environmental Impact Statement (EIS). The facility plan would look and several different alternatives including the creation of a "super utility" and a single regional treatment plant.

A request for proposals was sent to interested engineering firms. HDR Engineering out of Portland was chosen to prepare both documents. Work got started in late 1994. By 1995, the project was going full-blast. Interviews were conducted with the various stakeholders. The mayor of Dalton Gardens was interviewed. He made it clear that Dalton wasn't interested in sewers. Dalton Gardens was intentionally excluded from the regional boundaries.

By late 1996, both documents were nearing completion. The chosen alternative was to maintain the 3 individual utilities and their respective treatment plants. Eliminated completely was getting out of the river. Building winter storage ponds and land applying during the summer was not feasible. For CdA the land requirement would be 5,000 contiguous acres for irrigation – this much land did not exist.

In June of 1997, the final documents were released. The bottom line: Maintaining 3 plants had no more effect on the river than one mega-plant. The river could safely assimilate the combined flows.

Around this same time, a small grant was obtained from the EPA for a cursory screening model of future water quality conditions in the river. These screening level results confirmed the findings of the Environmental Impact Statement – no significant impact.

Sometime around 1995, staff approached the city council with a proposal for "an odor study". The headline before the council meeting read something to the affect, "City staff wants $50,000 to study if the sewer plant stinks". As can be anticipated, it was not approved. In 1997, council was again approached. This time it was proposed as an "odor control plan". It was adopted. Part of the plan involved interviewing the neighbors. We learned that one neighborhood was on the verge of filing a suit.

Foul air treatment for odor control was completed in 2000 at the plant. The system brings foul air from the most odiferous processes to compost-bed biofilters – similar to what is used at the compost facility. These can be seen as Number 14 on the following photo.

2004 Plant Aerial

1. Headworks & Screening
2. Pre-aeration & Grit Removal
3. Primary Clarifiers
4. Trickling Filter Feed Pumps
5. Trickling Filters
6. Solids Contact
7. Secondary Clarifiers
8. Sludge Re-aeration
9. Chlorine Contact
10. Chlorination/Chem System
11. Gravity Thickeners
12. Digesters/De-watering
13. Administration/Shop
14. Compost-Bed Biofilters
15. Diffuser Outfall

Beginning in 1998, Washington's Department of Ecology (DOE) determined that dissolved oxygen (DO) standards were not being met in the Spokane River and in particular Lake Spokane. Lake Spokane (also known as Long Lake) is the reservoir behind Avista's Long Lake dam. This DO impairment would require the preparation of a Total Maximum Daily Load (TMDL) to limit oxygen demanding contaminants such as Biochemical Oxygen Demanding (BOD) organics, ammonia and phosphorus. (A pound of BOD uptakes a pound of oxygen; a pound of ammonia uptakes 4.5 pounds of oxygen; and because of algae production, a pound of phosphorus uptakes 16 pounds of oxygen.) A TMDL consists of three components: a Load Allocation (LA); a Waste Load Allocation (WLA); and a Margin of Safety (MOS). The sum of all three is the TMDL. The LA is that fraction coming from non-point sources such as runoff, stormwater, tributary streams and precipitation. The WLA comes from the point sources, which are discharges coming from a pipe. The MOS is whatever "feels good", generally around 10 percent of the total.

River water quality data collected in 2001 was used as input values into a very complex, dynamic computer model used to calculate various scenarios of the three oxygen demanding substances. The program also inputs a wide variety of other variables that affect dissolved oxygen such as wind, temperature, rapids, sun light, etc. It takes over two days to run this model on a high-speed processor.

Also in 1998, the DEQ and the EPA released a heavy metal TMDL. Primarily focused on the Coeur d'Alene River basin and its tributaries, it would severely limit the discharge of lead, cadmium, and zinc. The original draft had a severe limitation on the three Idaho dischargers to the Spokane River. Only when we demonstrated that due to the hardness of the water we discharged to the river, we actually added ***assimilative*** capacity to the river for metals rather than used capacity, did the regulators back off. (This TMDL was thrown out by a federal judge for procedural error and is only now being re-visited).

Because the original city's Facility Plan had come to the end of its useful life by 2000, the city needed to write an update. The city went through a selection process and chose HDR Engineering out of the Portland – Seattle offices. In late 2000, the draft plan was submitted to the city. It did not anticipate the need to attain ultralow levels of phosphorus. The main elements included Phase 4B with most of what was actually built with the exception of covering the primary clarifiers. Phase 4C anticipated a new digester and extensive aeration basin expansion for ammonia control. Costs were estimated to be $8.5 million for 4B and $11.3 million for 4C. (Phase 4C was not built as a stand-alone project but the new digester was included in Phase 5B). The plan was officially adopted in 2001.

By late January 1999, Mayor Steve Judy had fired long-term city administrator Ken Thompson and even his short-term replacement Dan Dible. Early 2000 saw the arrival of new administrator Bill Panos. It turned out Panos was a micromanager of questionable integrity. In his relative short tenure he wreaked havoc. He also developed a department head "hit list" and woe to those at the top of the list.

In early 2001, Panos made a deal with the U of I over the Harbor Center office building. By this time the water department, the criminal division of legal plus wastewater were all housed in the building. Panos, with council approval, agreed to lease the entire building to the U of I for $10 per year. The motivation was to keep the U of I's presence in the core of the city. There was some talk about the university moving out by their research center in Post Falls. Sandi Bloem was sworn in as mayor in January 2002. She agreed with the basic premise of leasing. However, I don't believe any of the council agreed with Panos' draconian efforts to relocate all city offices.

By early June all of city staff was out of Harbor Center. Panos even agreed to allow U of I to have the revenues from the state forensic lab go to them rather than the city. In the meantime, wastewater and legal leased office space at 816 Sherman for a little over $28,000 per year for each entity. The water department shoe-horned themselves into a couple of offices they had in their side of the street shop.

On June 6, 2002, Panos was fired by unanimous vote of the council. (The anniversary of D-Day). Apparently, he had been very abusive verbally to the mayor. He repeated this short-tenured performance with the Washington State Office of Public Instruction, the city of West Sacramento, CA; and Eureka, CA. (He is now in Wyoming.)

The criminal division of legal is still leasing space at the same office. The water department built a new office near the city shop complex on North Ramsey Road.

By 2003, it was evident that this dissolved oxygen (DO) TMDL was going to significantly impact all of the dischargers on the river. (Dischargers include Coeur d'Alene, Hayden Area Regional Sewer Board [HARSB], Post Falls, Liberty Lake, Kaiser Trentwood rolling mill, Inland Empire Paper, Spokane County, and city of Spokane.) End-of-pipe numbers for phosphorus that were coming out were in the low parts per billion (ppb). Potentially this would cost hundreds of millions of dollars. (Influent phosphorus for CdA is about 7,000 ppb. The 1990 original phosphorus TMDL required our final effluent to be less than 1,000 ppb).

The dischargers banded together to commission and fund a "Use Attainability Analysis" (UAA). Beneficial uses include fishing, swimming, boating, irrigation, industrial process water, etc. An UAA looks at the most sensitive beneficial use. Typically that use would be as a fishery. The most sensitive use in the Spokane River is for salmonid (salmon, trout & whitefish) species' occupation. (But not spawning.) The UAA examines what minimum water quality standards are needed to support that use.

In late December 2004, the discharger consortium submitted the 2 volume, $1 million document to the Washington Department of Ecology (DOE). The UAA found no evidence of trout spawning and recommended a narrative standard for dissolved oxygen rather than hard numerical limits. By statute the DOE had 60 days to respond. On the last day of February 2005, the dischargers were notified that the department would reject our efforts. Our consultant's project manager was a former DOE director and close personal friend of then Washington Governor Christine Gregoire. After his intervention, the DOE agreed to a collaboration process with the dischargers and other interested parties including the environmental activist organizations.

This collaboration process involved all interested parties from both states. Included were EPA, DOE, DEQ, all of the dischargers, the Lands Council, Sierra Club, Center for Justice, Congressional representatives from both states, attorneys representing some of the dischargers, elected representatives of the various dischargers, and property owner groups. (CdA hired two environmental attorneys out of the Seattle area.) With so many at the table, it was soon decided that we needed a paid facilitator. Ross and Associates of the Seattle area was chosen. The dischargers picked up the bill.

The first Waste Load Allocations (WLA) to the dischargers had unbelievable inequities. The city of Spokane and Spokane County were given 50 parts per billion (ppb) for phosphorus while all the other entities were allowed 36 ppb. The regulatory rationale was that because the city of Spokane had more test results per week and that the county's new plant would have to test as frequently as well they would be allowed a higher value. Obviously, this lack of logic did not meet with approval. The bantering continued for over two years.

In the meantime, city staff could see the handwriting on the wall. Extremely low levels of phosphorus were going to be required – it was just a matter of what the final number would be. In the summer of 2006, four advanced third-stage (tertiary) processes were brought in for a 4-week pilot run. Three tertiary processes passed muster and would be considered in more detail in the future. These three, when optimized, were capable of producing an effluent of less than 50 ppb of phosphorus.

In 2007, the EPA issued a preliminary draft permit. The proposed summer growing season limit was 50 ppb. There was also a compliance schedule of less than 5 years. There were scientific flaws in the accompanying fact sheet. This permit was rescinded due to these flaws.

One of the biggest errors encountered was in the computer model being used. When the model was run on a faster dual-processor computer, the results would be different on each run with the inputs remaining unchanged. This was discovered by a modeling firm that the city hired to run different scenarios. Only when the model was run on a single processor computer were the results repeatable each time. The department commissioned the modeling firm to run a final scenario; one that had us beginning the phosphorus removal season one month earlier to the first of February. The results showed this was equivalent to having a seasonal average effluent of 50 ppb. This was accepted by the EPA.

The city completed and adopted another new facility plan in 2009. This plan recommended three sub-phases of projects over the next five to seven years. Total cost for these improvements and expansion was anticipated to be $71 million.

In 2010, the TMDL was finally approved by the EPA and adopted by the DOE. It took a remarkable 12 years and countless hours of effort.

While all of this wrangling over the TMDL was going on, the utility was not gathering moss. The capital improvement planning and construction projects continued as well.

Phase 4A was completed during the 2001 – 03 years. Major components included chlorination control improvements, aeration improvements and re-plumbing all stormwater catch basins to the influent headworks. This separation project prevents any spills in the interior of the plant from entering the storm system and flowing directly into the river.

Construction began on Phase 4B in 2005. Major elements included new headworks with influent pump station; centrifuge for sludge de-watering; electrical entrance with two feeders; and full height covers on the primary clarifiers. The clarifiers were covered for three reasons: odor control, aesthetics, and to get rid of the seagulls and crows eating raw sewage and then flying offsite. The covers cost nearly $1 million each, so the City Council was stretching with this decision. The design color scheme was picked by Councilwoman Dixie Reid (a good choice).

The city was “shovel ready” for Phase 4B and qualified for a 0.5 percent loan under the American Recovery and Reinvestment Act (ARRA). Contractors Northwest Inc. got the bid.

The following shows the 4B project.

During the winter of 2007, Casey Fisher and another operator were walking past Digester No. 2. (It was built in 1973.) They heard a whooshing sound. Later they noticed the domed cover was tilted. Investigating further, they found that the steel support feet on top of the concrete tank had sheared the anchor bolts. Further sleuthing revealed the digester had become over pressurized due to three simultaneous events. Three pipes had become frozen including the overflow pipe, the pressure relief valve and the methane gas draw off pipe.

During the summer of 2008 two projects were initiated. A contract was let to replace the cover of Digester No.2 and to recoat the steel mechanism of secondary clarifier No. 1. The digester cover was becoming dangerously corroded and the 1982 clarifier had not had a re-coating of paint.

Work on Phase 5A began in March 2008. Special fabric webbing modules were installed in the aeration basins. These units were called “IFAS”, standing for Integrated Fixed film Activated Sludge units. These provide a large surface area to grow the necessary bacteria that convert ammonia into harmless nitrates. It is a type of woven synthetic fabric. (We have an ammonia limit in our permit). The following shows an IFAS module:

Council approved the $4 million budget request to build and operate a pilot facility to evaluate three advanced tertiary processes. Construction began in the summer of 2009. Bids were solicited for the two microfiltration membrane units and General Electric's Zenon Division was the low bidder for the Membrane Bio-Reactor (MBR) and the Tertiary Membrane Filter (TMF). Blue Water Technologies of Hayden was sole-sourced as their moving bed sand filtration technology was proprietary. By late April 2010 the facility was commissioned.

The following is a view from the top of the Blue Water sand filters towards the MBR and TMF units.

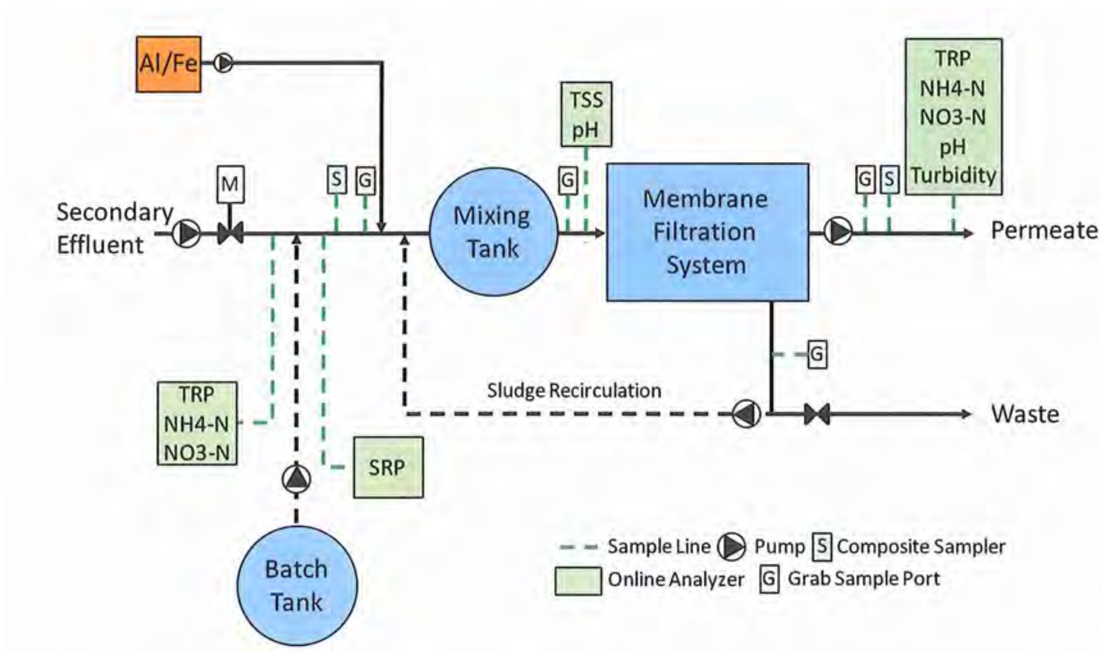
Each pilot was sized for 50,000 gallons per day or 35 gallons per minute (gpm). It was the intent to take the output (effluent) from one of the units and use it in a demonstration re-use project such as irrigation near the Harbor Center office building. To produce Class A effluent for such use would require a high level of disinfection. An ultraviolet (UV) disinfection process unit was installed in the pilot building as well. (The smallest one available was bought. It is a 4-lamp pressure cylinder and is capable of disinfecting up to 300 gpm.) Below is a photo.

A re-use permit application was submitted to the DEQ in early 2010. Unfortunately the bureaucratic red tape overwhelmed the city and by the end of the 2011 irrigation season the city still had not received the permit. The UV unit will be salvaged and relocated to the tertiary building during the second phase of membrane installation. It can be used to produce 400,000 gallons of Class A effluent per day.

All three processes met the target of less than 50 ppb phosphorus – most of the time. Blue Water had the greatest variations; occasionally spiking to 1,000 ppb. The TMF seemed to be the most consistent. Considerably high maintenance efforts were required with the sand filters as they were always plugging up.

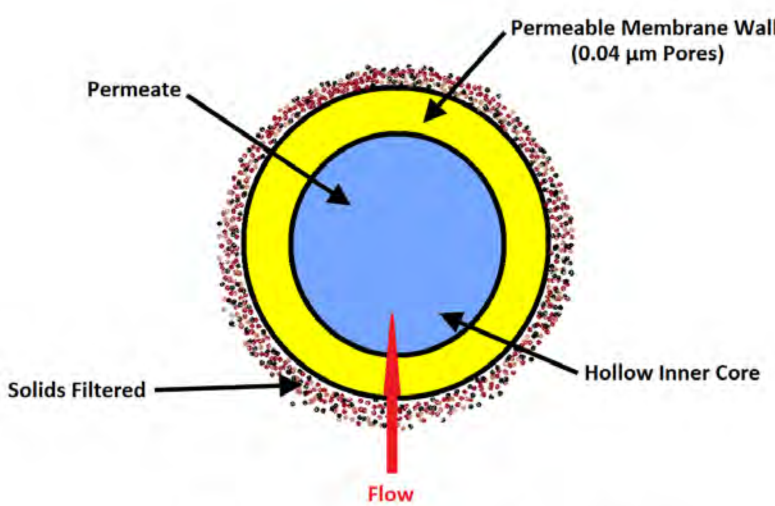
The tertiary membrane filter (TMF) not only worked well for phosphorus removal, but a second benefit was discovered. Because there was a return activated sludge (RAS) recirculation line from the membrane tank to the chemical mix tank, mixed liquor was created. In simple terms, because the membranes were receiving constant scour air and coupled with the RAS flow, nitrification occurred; driving down the ammonia as well. For these reasons the TMF was chosen to be built at full-scale.

The following is the schematic for the TMF pilot. (Full-scale will be similar.)



The following pictures show the actual membranes at the attachment point on a module while the next shows a cross-section of how the membranes work.

The membranes resemble hollow strands of spaghetti and are between 7 feet and 8 feet long.



Cross-Section Through a Single Membrane Filtering Fiber

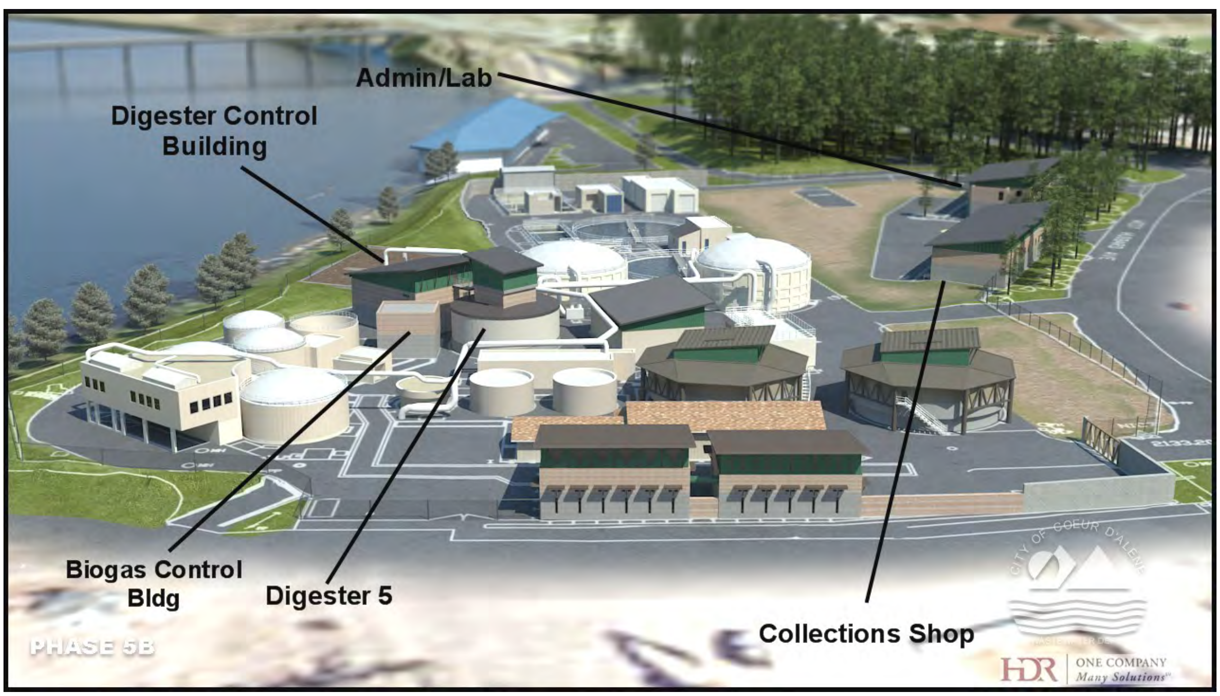
The pores through the synthetic outer layer are extremely fine. The nominal size of the pore is 0.04 microns. Bacteria range in size from 0.2 to 2 microns. Giardia cysts average 4 microns. Viruses can range from 0.005 to 0.3 microns. It can safely be stated that these membranes will filter out 100 percent of the bacteria and ***some*** viruses. The purpose of such fine pores in wastewater is not to remove the bacteria, but to capture the very fine precipitate (particles) of aluminum phosphate.

Aluminum sulfate is soluble in water. It is added pre-mixed with water to the chemical mix tanks upstream of the membranes. The aluminum reacts with the phosphate ion to form the insoluble aluminum phosphate, which is filtered out by the membranes.

Pilot testing ended in November 2011. A huge amount of data was collected over this time. As many as 60 samples per day were being run through the lab's new auto analyzer. It took the next nine months to analyze all of the data and to issue a final report. The final report was sent out in August 2012.

The pre-design document for the facility plan noted several improvements and additions to move to a 20-year design horizon of 6 million gallons per day (mgd). This project was designated as Phase 5B. One of the additions needed was additional solids treatment in the form of an additional, and a much larger, anaerobic digester to be known as No. 5. Also needed was a new laboratory/administration office building along with a new shop building for the collection system equipment. An innovative feature was increasing the harvest of the methane or the "biogas" generated during the digestion process. The recently purchased boilers would be re-located to the new digester control building. Hot water piping would be extended to provide heat to a total of 9 structures including the lab/admin and new shop as well as the 4B Influent Pump Station (IPS).

The city applied for a low interest loan through the DEQ. Again, we were close to being ready for bid and the DEQ moved the project up the loan funding priority list. Phase 5B was built during the 2010 to 2011 construction seasons. It included to following elements:



Contactors Northwest Inc. was awarded the bid.

During 2012, the city received several revisions of the DEQ's "401 certification". Under Section 401 of the Clean Water Act, states must certify to the EPA that the proposed permit limits will meet that state's water quality standards. Most of these revisions were minor and did not cause alarm.

In September 2012, the DEQ issued another revision that caused great concern. There is a part of Idaho administrative code that states, in effect, that for any water body that is impaired (doesn't meet the water quality standard) and there is no TMDL in place for that impairment, then the state cannot increase the load for that contaminant beyond the previous permit.

A staff attorney for the DEQ interpreted this use of the word "load" to mean no increase in pounds. TMDLs can be written for such parameters as pH (acidity), temperature and bacteria; all parameters that are not measured in pounds. The attorney deemed that the dischargers could not increase the number of pounds of cadmium and lead. The fact that the amounts of these metals released are measured in concentrations based on the hardness of the water being discharged did not sway him. (The harder the discharge water, the higher the concentration can be.) Most of the concentrations are measured in parts per million (ppm).

The EPA agreed with us in their draft permit fact sheet. The EPA found that no limit was needed at all because there was no "reasonable potential to exceed" the water quality standards. The potential of appealing this interpretation by the DEQ was discussed in light of the EPA's finding.

One of the draft permit conditions that the dischargers had successfully negotiated was for a 10-year compliance schedule. It is essentially a series of milestones we had to complete in the years following the issuance of the final permit.

- 0.5 Years Submit toxics management plan
- 1.0 Years Submit phosphorus management plan
- 3 Years Full-scale pilot built and furnish results
- 5 Years Design complete for full process
- 8 Years Full process built and begin optimization
- 10 Years Full compliance achieved

In Idaho there are two methods of obtaining approval for a utility to incur more debt. The first is a public vote of 67 percent approval to issue revenue bonds. The second method is used more than elections for federally mandated requirements. The city petitions a state district judge to find that the project and its expenses are "ordinary and necessary". (There is much case law as to what constitutes ordinary and necessary.)

After more than a year of effort, the utility's new rate analysis and recommendations were ready for adoption just after the first of 2013. Monthly rates were proposed to increase 8.5 percent each of the first three years and 8 percent each of the next two years. Significant increases in the capitalization fees charged to new customers were also proposed.

Back around 2000, the city petitioned for a judicial confirmation with a district court to allow the utility to borrow up to $28 million to finance Phases 4B and 5B. The loans for these two projects exhausted our allowable debt service expenses. By January 2013, the city was ready to return to court for a judicial validation. We did not expect opposition from a member of the city council.

On February 27, 2013, a hearing took place in front of Judge John Luster. Near the end of the hearing, Councilman Steve Adams was granted time to speak in opposition of the judge granting the city the ability to issue $33.5 million in revenue bonds. Judge Luster took the matter under advisement. The city's attorneys' expected a decision within a month.

While waiting for the judge, it was decided to begin the process of holding a bond election. At stake was a $7.6 million loan from the DEQ. If the city delayed signing the acceptance agreement much longer, losing the loan completely was possible. By April the city was ready for an election, if required. On April 2, Judge Luster affirmed for the city. At a special council meeting following the ruling, Councilman Adams rescinded his objection saying the judge's ruling had language that affirmed his original objection. State statute allows 42 days for the ruling to be appealed. At the end of the appeal period, the city signed the loan acceptance on May 28, 2013.

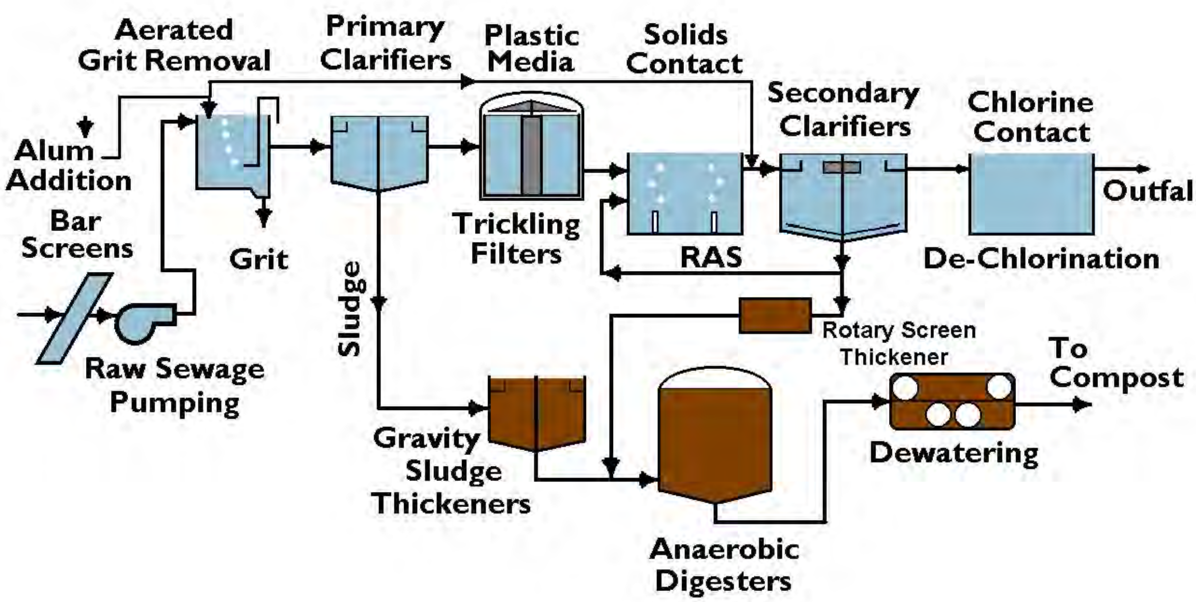
Bids were opened in early July and Williams Brother (not plural) was awarded the bid at a little more than $8.6 million. The city requested an extra $1 million from the DEQ to cover the extra cost. The DEQ granted the additional loan amount. The contractor got started in mid-August with excavation for the facility. The following is a rendering of the entire Phase 5C project.

Phase 5C-1 is to produce 1 million gallons per day (mgd) of Class A effluent, suitable for irrigating lawns at private homes. The tertiary building will house the full 6 mgd of necessary equipment including all pumps and blowers. About a half of the needed chemical mix tanks will be built in this first contract. During the second phase of tertiary construction the UV disinfection system will be located in the tertiary filtration building (TMF).

Unfortunately, the contractor became way behind schedule very early on. About 5,000 cubic yards of dirt had to be removed to construct the building and tankage. An excavator with only a ¾ cubic yard bucket was used. This resulted in no concrete work beginning until well into October. However, many processes should be commissioned by September 2014.

The public comment draft of the permit was released on August 3, 2013 with final comments due by October 3, 2013. The EPA has still not issued response to comments as of late April 2014. On April 10, 2014, the DEQ backed off on the metals "loadings" and are removing any requirements for cadmium and lead. An agency draft of the permit was issued by the EPA on April 2. Revisions to the phosphorus management plan followed many of the utility's requests.

The following is the plant profile as of pre-Phase 5C-1:

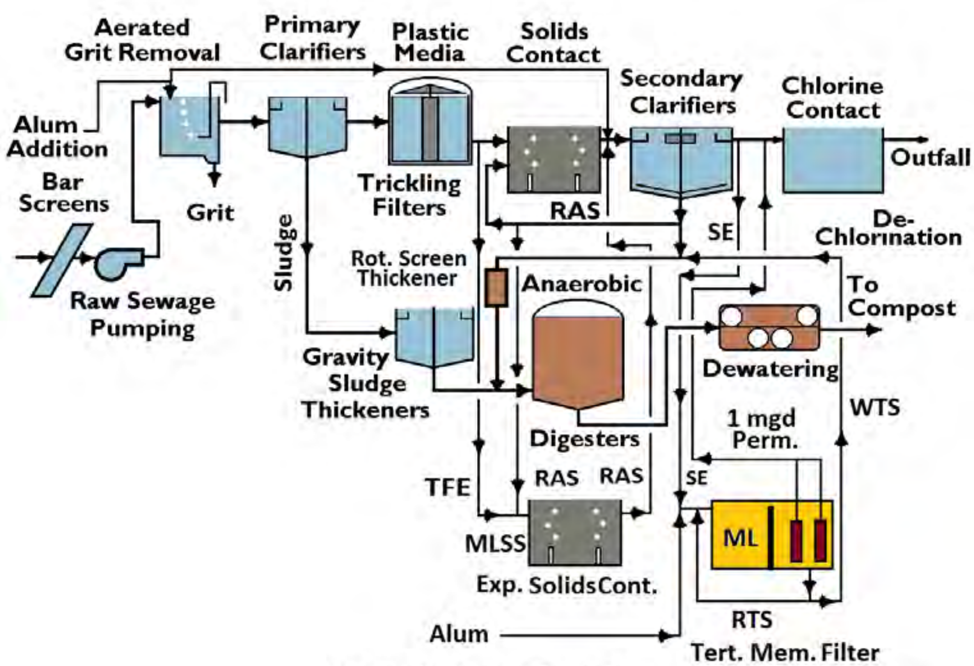


Early 2014, saw the estimated population of the city at 45,500, of which it is estimated 99 percent are on sewer. Average daily flow is 3.8 million gallons per day (mgd).

The following is an aerial oblique photo taken in December 2014.

In July 2014, the city was notified that the EPA was proceeding with eliminating the limits on cadmium and lead from the permit. This will result in the heavy metals no longer being an issue. The city would like to think they played a small part in the decision. It appears there is no reason to persue an appeal of the permit.

The following is the plant's current hydraulic profile following completion of Phase 5C-1.

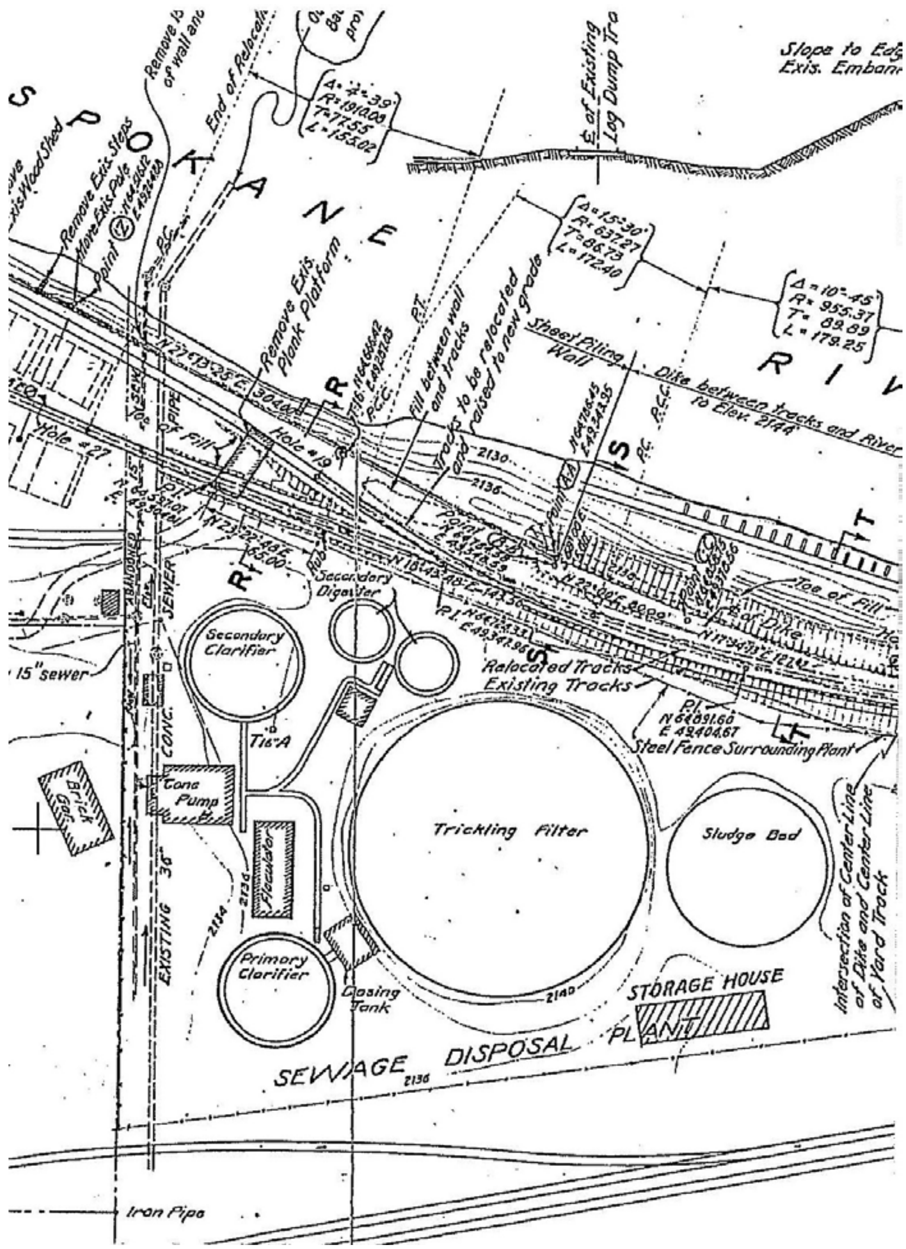


Coeur d'Alene's Tertiary Wastewater Plant

CHAPTER IV – LABORATORY

More Recent Years 1972 to Present

The original 1939 construction did not include a separate lab building. Presumably, testing was perfomed in the pump room of the influent pump station at ground level. By 1972, a lab building and a separate garage existed. The 1973 contractor was to demolish the lab and build a new one along with a new attached garage. (The city moved the old garage.) City Council minutes are silent on when these pre-1973 structures were built. The following are the structures recorded by the Army Corps of Engineers in 1940 for the flood protection dike.



It is very possible that the original lab was built with city forces. An office add-on to the 1973 lab was built by city labor sometime circa 1978. (Personal recollections from Casey Fisher). It existed by the arrival of new superintendent Tom Liston in May 1979.

This 1973 lab and garage are still in use and were the core for the remodel and extension during Phase 2A in 1986. However, no additional lab space was provided in Phase 2A. This was the facility that Dave McKeown started in in May 1977. At that time there were only five employees in the entire department. (superintendent, lab analyst and three operators – for both plant and collections system. (Personal recollection of Dave McKeown.)

Phase 2A included construction of a hallway along the wall separating a custodian closet, restroom and storage closet from the lab on the north side of the building. It did nothing to increase square footage. The lab remodel included a center island, new cabinets and stainless steel countertops along three walls. The north wall on each side of the entry door had a small desk and book-shelves. With the center island, there was very little passing room.

In the first part of January 1988, Julie Wood was hired as a lab analyst. With a plant operator trying to run belt press solids tests, along with McKeown, the lab was beginning to get crowded. It became even worse in April of 1991 when a second analyst, Dean Parrish, was hired.

By this time, there were more reporting requirements on the Discharge Monitoring Reports (DMR) that were sent monthly to the EPA. The lab was also doing the bacteriological testing for the water department. McKeown was spending more of his time working the Industrial Pretreatment Program (IPT). (Any customer discharging other than domestic sewage has to have a permit and meet their own dischage standards. This is a federal requirement of the Clean Water Act).

Summer of 1992, resulted in extremely low river flows due to very low snowpack in the preceding winter. The utility took on the task of performing significant water quality monitoring to characterize what was happening in the river during these conditions. A number of parameters were tested. Included were Biochemical Oxygen Demand (BOD), Total Suspended Solids (TSS), pH, phosphorus, ammonia, chlorophyl, temperature, dissolved oxygen, and fecal coliform bacteria.

A secondary reason for this study was to verify or dispute what was believed to be erroneous results in the Falter study a year earlier. Dr. Falter was a professor of agriculture at the University of Idaho. Why he was commissioned by the DEQ to conduct a water quality study remains a mystery. Our results did refute many of his findings and conclusions. The report was forwarded to the DEQ and the EPA and remains unacknowledged.

In the summer of 1993, after a couple of years of requests, a budget was adopted for a remodel of an annex building at Harbor Center. This annex had housed men’s and women’s locker rooms, showers and restrooms as well as a common hot tub room. As part of this remodel, the lab was moved to Harbor Center. The new lab offered room for each analyst to have a desk and a computer. There was sufficient space for three to work; although marginal.

About this time the workload forced us to stop doing testing for the water department.

The following photos are of the 1993 lab.

At the same time the Total Maximum Daily Load (TMDL) for heavy metals in the basin was being developed, the new discharge permit was issued in late 1999. At that time it was realized that the metals limits in the permit used the assumption that all recoverable metals in a sample was in the dissolved form and biologically available. With no data showing otherwise, we could not dispute this default assumption.

In the late fall the department purchased an 18-foot, open-bow boat with inboard-outboard drive. Weekly samples of the river water above and below the plant's outfall would be taken concurrently with the final effluent. In consultation with, and approval by the EPA, a strategy was devised to mix the effluent with river water samples that would reflect higher effluent portions during low river flow. Lower effluent mixtures would approximate high river flow conditions. To remove the likelihood of contamination, ultra-clean sampling techniques were employed. This would require a second person in the boat. One would act as the "dirty hands" while the second would be the "clean hands". (Look it up for details).

The samples were sent to an outside lab that could measure to extremly low concentrations; sometimes in the parts per trillion range. Samples would be tested for total recoverable and dissolved metals. (Typically these would be for copper, zinc, silver, cadmium, and lead). A ratio of dissolved to total recoverable could then be calculated. (This is referred to as the "translator").

This project lasted an entire year including winter. Below, Dave McKeown is shown out on the river in the boat.

The EPA was then petitioned to reopen the permit and make adjustments upward on our limits in accordance with the translator values. The project was estimated to have saved ratepayers about $5 million.

The year 2000 saw Dean Parrish leave and Susan Whittier begin. The year 2007 saw McKeown retire and John Dearth hired as his replacement. In 2010 Julie Wood retired and David Hauser came on to replace her.

In early 2010, it was obvious that when the new pliot was completed, it would be generating up to 60 samples per day for the analysis of phosphorus. To handle such a volume, an autoanalylizer by the Lachat company was purchased for around $90,000. This allowed the lab staff to keep up with routine testing and process the samples for the pilot operations as well. The machine, something right out of CSI, is shown below.

In about this same period, the Water Environment Research Foundation (WERF) began conducting a phase of their nutrient research. They selected 10 labs nationwide to help conduct the project. The city's lab was one of the 10 nationwide. Samples were sent to the labs for phosphorus testing. Only WERF knew how much phosphorus was in each sample. Results were reported back to WERF. The city's lab was the only one that consistently reported results very close to the actual amounts in the samples.

By late April 2011, the new admin/lab building was substantially complete and staff moved in. It was a joyeous day to have all staff with the exception of the compost operators back at the plant site. The move also accomodated plant and collections well. Collections now had their own shop and breakroom. The plant now had an adequate shop area to effect repairs on pumps, etc. and to do fabrication projects. The plant breakroom had plenty of space and the operations room was dedicated to just that.

The following shows the new lab.

CHAPTER V – COMPOSTING FACILITY

From the Beginning in 1988 to Present

Almost concurrently with Phase 3B in 1988, the city went forward with a composting facility. Construction was completed in 1989 and was fully operational in late fall. It was not optimized until 1990. Bill Porter was assigned as the head operator at the time.

The plant uses a process known as aerated static piles. Biosolids and wood chips are combined to obtain a mixture that is placed in piles where air is either drawn or blown through the material. Biology kicks in and the piles begin to heat up. The minimum required temperature is 131 degrees F. (We have seen pile temperatures of up to 180 degrees F.) This portion of the process takes 21 days. These temperatures and times insure a complete pathogen kill.

The mixture is screened with the larger fraction returned to the recycled chip pile. The fine material, quarter-inch or less, is placed in aerated curing piles for an additional 30 days. Following that it is ready for wholesale marketing to local landscapers and nurseries under the city's trademarked name "Coeur d'Green"™.

This was a very innovative and risky decision on the part of the city council. The primary advocate for this state-of-the-art process was Dixie Reid of the council.

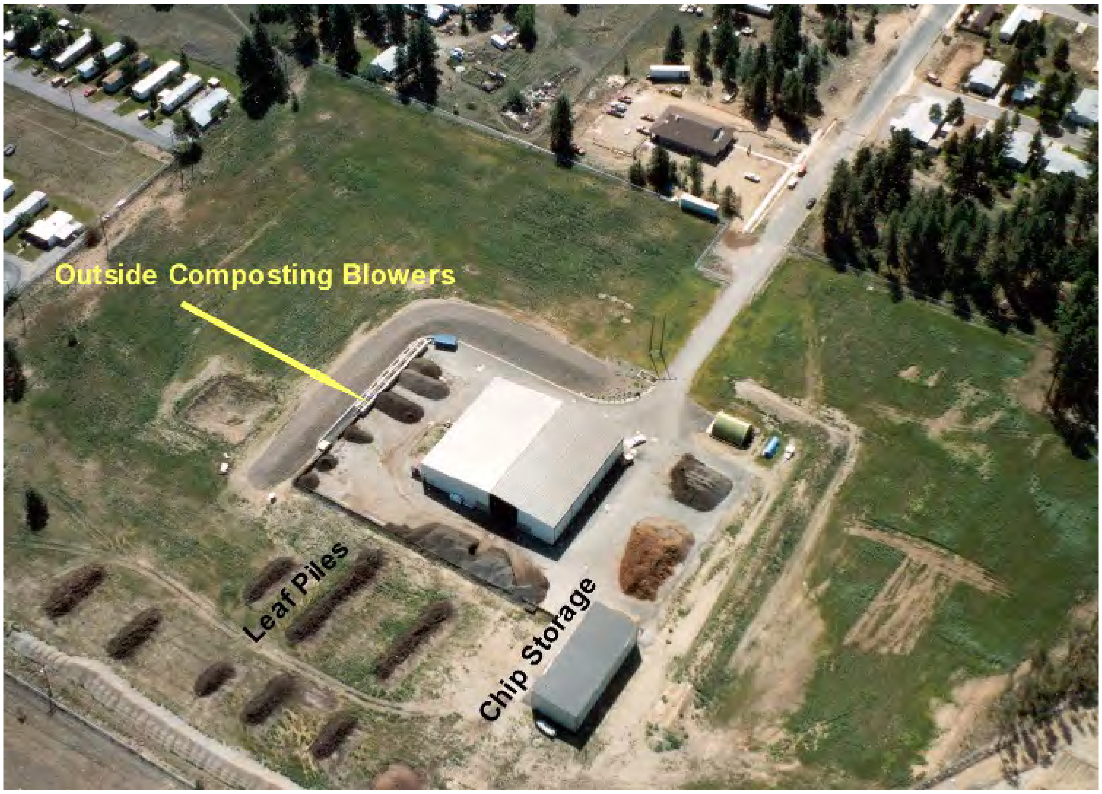
Montgomery Engineers' Boise office was the engineering design firm. While there were major design problems, it has to be recognized that composting biosolids in the Northwest had never been tried before. Even the expert sub-consultant hired by Montgomery had no experience in these climes. The original building was open to the elements down the center to the extent that 25 percent of the interior was subject to rain and snow. It's never been discovered why this was done. There was no place within the structure to store dry chips. Originally there was a portable rubber-tired mounted mixer and also on a rubber-tired mounted trommel screen. Both portable units were of marginal capacity at best.

The optimal moisture content of the wood chip/biosolids mixture prior to placement in the aerated piles is 50 percent. During the wet season (winter), the chips would swell with moisture and become as high as 40 to 60 percent moisture. When mixed with biosolids of 85 percent moisture, getting a final blend of 50 percent was not possible. By 1991, lead operator Billy Ray Porter was buying alfalfa seed husks that only had 1 percent moisture. As this was a waste product, only the shipping had to be paid for. The husks were added to the mixing unit and acted as a drying agent.

June 1991 saw the beginning of phosphorus removal by the addition of liquid aluminum sulfate – alum. This causes the phosphate to settle out of solution as very fine particles (precipitate) of aluminum phosphate. The volume of the biosolids cake going to compost increased almost three-fold. Not only was more sludge being produced in the clarifiers, but this chemical sludge couldn't be digested. It also affected the de-watering process. On a good day the cake coming off the belt filter press would be around 17 to 18 percent solids. With the chemical sludge now a part of the process, the cake was running 14 to 15 percent solids.

Compost operators don't care so much about the weight or density of the biosolids received as it is the volume that has to be handled.

In 1992, a contract was let to cover the central section of the main building and to build a chip storage shed. The storage shed has massive concrete walls that a front end loader can push against to fill the bucket. A concrete push wall of eco-blocks was added on the eastside of the main plant site. Behind this wall were additional blowers where outside composting could take place during the dry summer months. This added capacity coincided with the increased biosolids generated during the phosphorus removal season. (Phosphorus removal only was required during the growing season of May to October). Asphalt was added to the paved pad to have more room for materials handling and storage. The photo below shows the facility shortly after construction.



Very early spring of 1993, Porter informed administration that something very strange was occurring with one of the piles. An inspection revealed a very curious phenomenon. It looked like the pile was breathing. On closer scrutiny, the entire exterior of the 8-foot-tall pile was covered with very small spider mites. Apparently the pile had no air flowing through it for a couple of weeks. The mites found a great food source and the population exploded. When the air was finally turned on, the high ammonia content drove them to the surface. There's always something new in the foreign land of compost.

Paul Mitchell was now a full-time senior compost operator and Clark Thomas was a trainee. In October 1993, Bill Porter left the city on a medical disability. Before leaving the department, Porter helped work through the design of a completely new materials handing approach. After Porter's departure, Mitchell became lead and Thomas became a compost operator.

Staffing at the compost facility was an early issue. The original design called for one operator and one front-end loader. There was no way that management was going to accept the liability of one individual working at a remote industrial site while running heavy equipment. There were more than enough tasks to warrant a second operator.

It was also found early on that one front-end loader was not sufficient. After the composting time in the piles, all pathogens had been deactivated. The pile would be broken down by the front-end loader and the mixture fed into the screen. It certainly did not make sense to do this with the same machine that had handled the raw biosolids. Contamination is an important consideration.

Bids were let in 1994 for the automated materials handling equipment. Samples of unscreened compost had been sent to a manufacturer of screens. A "gyratory" screen was chosen. The idea was to create three fractions of screenings. The first would be the three-quarter-inch plus material that wouldn't pass through the top screen. This product would be conveyed to the recycled chip pile and reused. The next fraction would the product that was three-quarter-inch minus and a quarter-inch plus in size. This stream would pass to a hammer mill where it would be ground to quarter-inch minus in size. This stream would join the stream of product that had passed through the bottom quarter-inch screen to become the final product. This process was expected to generate an additional 1,000 cubic yards of compost per year.

About two years into the new system it was discovered there were some very erroneous assumptions with this part of the process. Firstly, the 100 horsepower motor on the hammer mill used about $12,000 of power per year. The revenue from the extra 1,000 cubic yards of compost brought in about $11,000. Second, the grindings from the mill acted as a new carbon source in the finished product. This meant that the pile would go anaerobic and re-putrefy. Thirdly, the department was purchasing premium chips at this time to just grind them up.

The gyratory screen also proved to be a boondoggle. While it worked with the material sent to the manufacturer, at full-scale there was a major problem. The screen deck was originally covered. The screen would "blind" (plug) with human hair. Hair does not breakdown in the digestion process. The operators cut holes in the cover so they could clean the screen every couple of hours. This obviously decreased productivity substantially.

Compost operators fought with these machine problems until early 1998. A local company emerged with a solution. They would use the 100 horsepower motor from the hammer mill to power a hydraulic pump that would turn a new trommel screen and accompanying conveyor belts. The existing conveyor system was reconfigured. The firm gave us credit for the hammer mill and gyratory screen. Staff used the city's welder from the Street Department to do the bulk of the fabrication. By the summer of 1998, compost operators now had a system they were confident would work.

The following shows the trommel screen unit.

At this point in the normal operations, it was estimated that the facility could handle all of the biosolids generated from the treatment plant at a flow of 6 million gallons per day (mgd). The price of chips had been steadily rising. The facility was able to switch to a much coarser material called “hog fuel”. Costs were still higher than originally forecast, but still less expensive than trucking the solids to the landfill at Fighting Creek or transporting to Eco Compost in Missoula, where a “tipping” fee is charged.

Beyond a doubt the operators performed exemplarily enacting odor control. A compost bed biofilter had been used to control odors from the onset. There was one neighboring resident that was very sensitive to odors. She became part of the team. She would log the date and time of any incidents, the character of the odor, its intensity, and duration. She would submit the log periodically. Although there were little changes in operation, she was a participant rather than an adversary. At one point the plant tried an experiment using sludge from Post Falls. (They used aerobic digesters which produced sludge with much higher volatile organics). Our resident characterized the odor as “steaming vats of elephant s _ _ t”. That was the end of the experiment. It was no surprise that compost bed biofilters were insisted for the treatment plant’s odor control system in 1999. The operators also kept the adjacent retiree community calmed. With a few buckets of compost, they had made good friends.

As spring would come and the demand for compost increased, the operators faced a problem every year. The cured piles would sit on the tarmac all winter, so they were already soaked with moisture. When the spring rains came, the finished product would have the consistency of oatmeal mush, especially at the bottom of the piles. In 2004, a large open-bay pole structure was erected to provide covered storage during the winter. It also allowed the facility to do the aerated curing process under its cover.

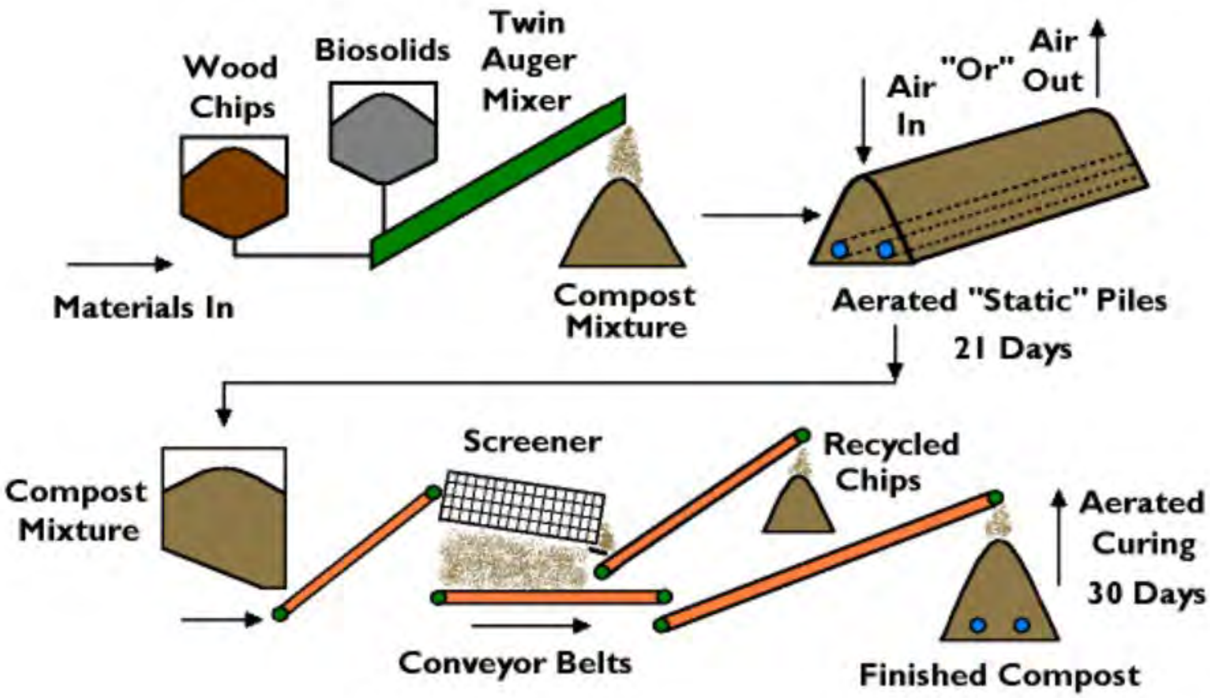
The installation of a high-speed centrifuge at the treatment plant to de-water sludge proved to be a boon for the compost facility. While the belt press could barely produce a cake at 15 percent solids during phosphorus removal season, the centrifuge produced a cake at nearly 26 percent solids year-around. The centrifuge was added as part of the Phase 4B project in 2006 and it took about a year for the operators to get it dialed in and optimized. The dryer cake required considerably less chips to produce a mixture of the correct moisture content of about 50 percent. Biosolids from the belt press would normally require three parts chips to one part of biosolids. The biosolids cake from the centrifuge allowed for two parts chips to one part biosolids. This resulted in less finished product but at a considerable savings in purchased raw materials. The only negative came as a result of the necessary addition of polymer to aid in the de-watering process. More polymer was required for the centrifuge and because of the lower volume produced due to the dryness of the cake; the concentration of polymer in the cake transported to compost was higher. This meant that biosolids stored over the weekend would produce noxious odors when it was loaded out on Monday morning.

Odors had never been an issue along the north boundary of the compost plant. The adjoining property was within the city limits and was zoned industrial. In 2007, a developer requested the property be re-zoned residential. Wastewater staff was instructed to stay neutral on the issue. The developer hired an environmental engineering firm to assess odors and prevailing wind directions at the property line. This went on for a number of weeks. The planning and zoning commission voted unanimously to deny the re-zone request. The developer appealed the decision to the council. On a three to two vote the council overruled the planning commission and granted the re-zone. Council did caution the developer that there would be occasional odors and not to complain.

Compost operators had been using a small part of the chip storage building as a receiving area for biosolids delivery. This put the biosolids storage over a weekend near the north boundary. By 2008, odor complaints were being fielded from the developer. These complaints were never directed to wastewater; they always went to the finance director. There was one staff meeting with the developer to discuss what could be done to mitigate offsite odors. The offer was made for the department to help purchase shrubs to be planted along the developer’s perimeter to help disperse odors. No follow-up contact was ever made. The north perimeter landscape berm was extended to the west, obscuring the subdivision and dispersing odors somewhat. As the development built-out and homes were built, residents began complaining on occasion.

In 2009, the department constructed a large pole building closer to the southern property line to be used as a receiving place for biosolids. It was constructed such that exhaust ventilation could be added and foul air blown into a compost bed biofilter. To date no air handling units have had to be added. The number of odor complaints is much less.

The following is the current compost plant profile.



Piles are about 8 feet tall, 15 feet wide at the base, and 60 feet long.

The following is the current aerial of the plant.


Landscape Berm
New Chip
Storage
Curing Shed
Trommel Screen
Landscape Berm
Recycled Chips
Inside Composting Piles
3500
Exterior
Blowers
Exterior Composting
Piles
Biosolids
Receiving
Shop
Landscape Berm

CHAPTER VI – EPILOGUE

August 2014, marks two major milestones of the city's wastewater department. The first pipes in the collection system turn 107 years old. The treatment plant celebrates its 75th anniversary. While there are many communities with older collection systems, there are a relative few that can boast having an older secondary treatment plant; especially in the Northwest. That fact alone makes this history quite rich and unique compared to similar communities in all of the mountain west.

For many of the early years it was common engineering practice to oversize a pipe from what was really needed. This was done to make grade, i.e., if it needed to be at a flatter grade to connect the elevations available at each end, use a bigger pipe. This was done on the 36-inch interceptor that started at First and Sherman and ended in the Spokane River near the plant site. The starting elevation was fixed and so was the other end at the Spokane River. A 36-inch pipe can be laid at a flatter grade than a 24-inch pipe and still generate the needed scour velocity of 2 feet per second (fps). (At less than this velocity solids drop out and build up in the bottom). The falacy of this approach is that the pipe must be a least half full to generate the needed 2 fps. It takes a lot more flow to half fill a 36-inch than to half-fill a 24-inch. There is no doubt that when this 36-inch main intercepter was built, there had to have been serious solid deposition that resulted in more maintenance and plenty of odor generation.

It was the existance of this interceptor that was the primary impetous for locating the treatment plant where it sits according to an article published on August 18, 1938 in the Coeur d'Alene Press. The article also noted the the purchase price for the five acres of land to buld the plant was $666. The land was purchased from the Winton Lumber Co.

Thankfully, whomever the decision maker was to have oversized this interceptor, it is a blessing today. Initially, all of the development that occurred east of 15th Street and north of Sherman Avenue flowed through this main interceptor. Today everything east of US Hihway 95 and north of Appleway to the city limit flows through it. All the area east of Northwest Boulevard and south of Appleway/Best Avenue also drains into it. Today it flows about 75 percent full at the treatment plant. A detailed capacity model of the entire collection system shows very few areas that will have flow problems at ultimate build out.

The age of this interceptor was not known until an article dated January 9, 1937 was found in the Coeur d'Alene Press. It was noted that construction would begin on the 4,280-foot trunk sewer on January 11, 1937. The project was funded by the Works Projects Administration (WPA) for 87 percent of the $68,742 total cost.

During construction of the new Higher Education Corridor street system in 2010, a new manhole had to be placed over this interceptor just east of the plant gate and near the extension of Hubbard Avenue. The top of the pipe had to be cut out after the manhole base had cured. Inspection revealed that this pipe had lost none of its internal concrete surface due to hydrogen sulfide gas build up; it was like new. Typical design life of pipes are figured to be 75 years. When it is required, lining this pipe may well extend the life another 75 to 100 years.

If the collection system earned a grade of a B- in 2013; then the plant should receive an A-; compost an A; and the lab an A+. (Many communities' collection systems are at a D-.) Overall, the city's wastewater department is in good shape. Some $100 million in plant improvements and $18 million expended to the collection system over 34 years should result in decent grades.

The department's personnel deserve a high grade as well. Many have 15-plus years with the city. A more dedicated group of professionals cannot be found. The following tables detail each employee's tenure with the city and years in the wastewater field or trade as of July 2016.

Administration

Employee	*Title*	*Years With City*	*Years In WW or Trade*
Fredrickson	**Supt.**	**29**	**43**
Keil	**Asst. Supt.**	**24**	**42**
Remitz	**Capital Program Mgr.**	**6**	**38**
Becker	**Project Mgr.**	**3**	**25**
Shute	**Field Inspector**	**28**	**32**
Green	**Admin. Assistant**	**7**	**17**

Treatment Plant

Employee	*Title*	*Years With City*	*Years In WW or Trade*
Fisher	**Chief Operator**	**32**	**32**
Moore	**Senior Operator**	**16**	**21**
Williams	**Senior Operator**	**16**	**21**
Taylor	**Operator**	**6**	**6**
Branscome	**Operator**	**4**	**9**
Ruiz	**Operator**	**<1**	**7**
Zwiebel	**Plant Mechanic**	**13**	**29**
Camp	**Plant Mechanic**	**3**	**7**

Collection System

Employee	*Title*	*Years With City*	*Years In WW or Trade*
Parsons	**Collection Supervisor**	**26**	**32**
Steeley	**Senior Operator**	**28**	**28**
Castleberry	**Senior Operator**	**18**	**19**
Schrempp	**Senior Operator**	**25**	**27**
Callihan	**Operator**	**3**	**5**
Grytness	**Operator**	**3**	**6**

Labratory

Employee	*Title*	*Years With City*	*Years In WW or Trade*
Dearth	**Lab Supervisor**	**9**	**24**
Whittier	**Lab Analyst**	**16**	**25**
Hauser	**Lab Analyst**	**6**	**16**

Compost

Employee	*Title*	*Years With City*	*Years In WW or Trade*
Mitchell	**Lead Operator**	**28**	**28**
Thomas	**Operator**	**25**	**25**

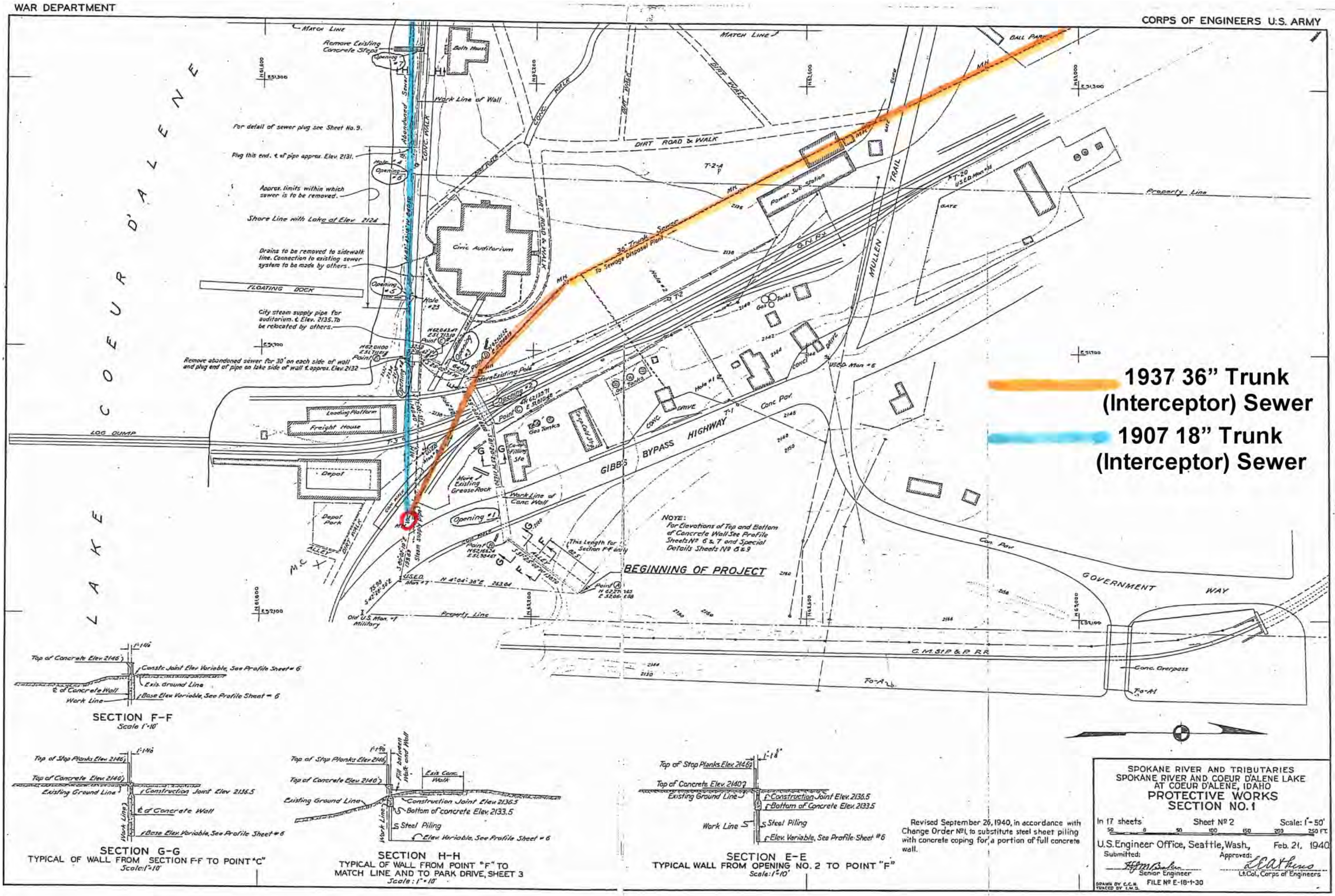
The Wastewater Department staff represents a total of 375 years with the city and 564 years in the trade. (Nearly 23 years average per employee.) The 25 staff of wastewater represents 7 percent of the total full-time equivalents (FTE) of 356 for the entire city. For the current fiscal year of 2014, wastewater expenditures of $20.9 million are 27 percent of the total city budget of $77.9 million.

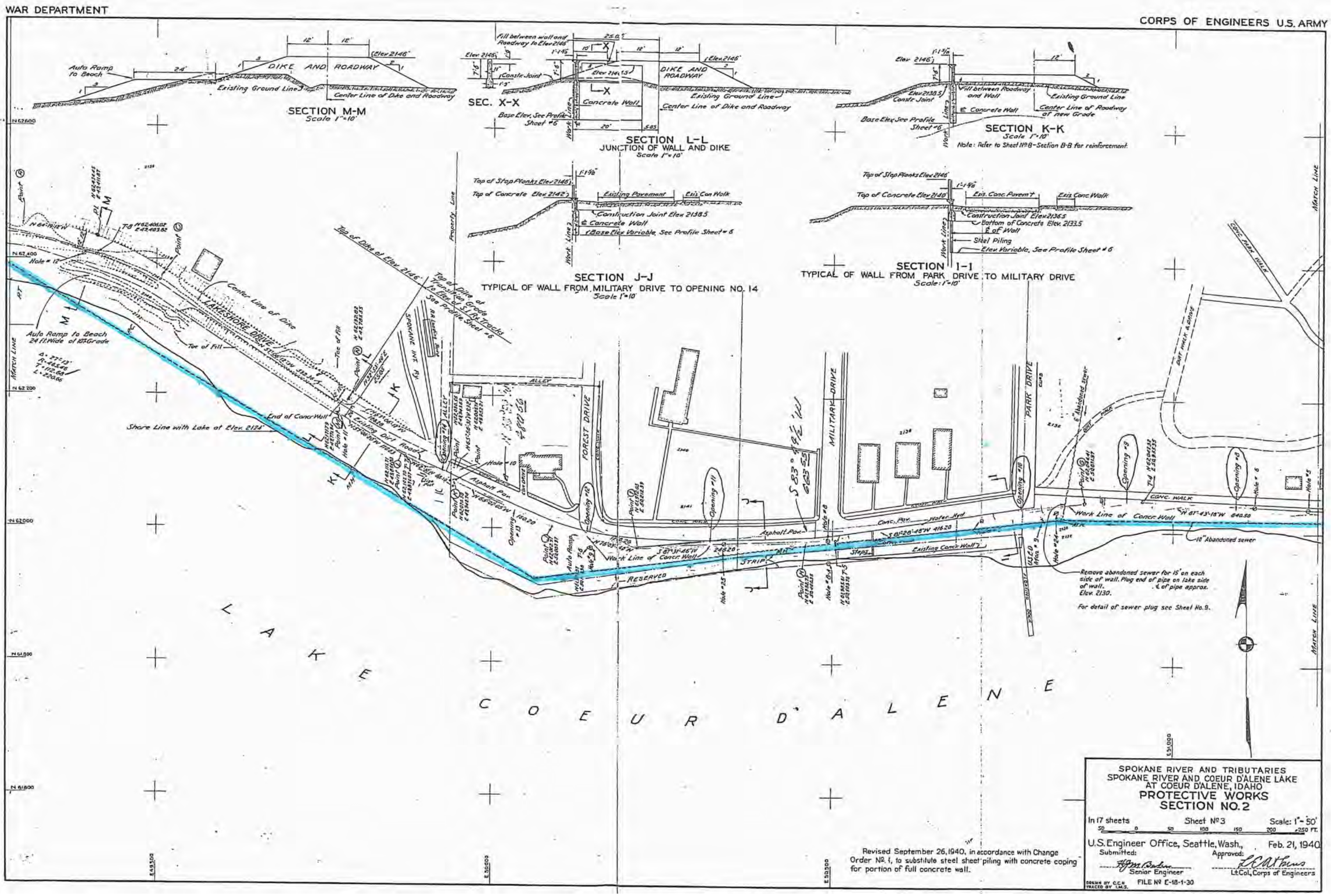
It is hoped that this document will continue to be the basis for future compilers to continue to write the department's history.

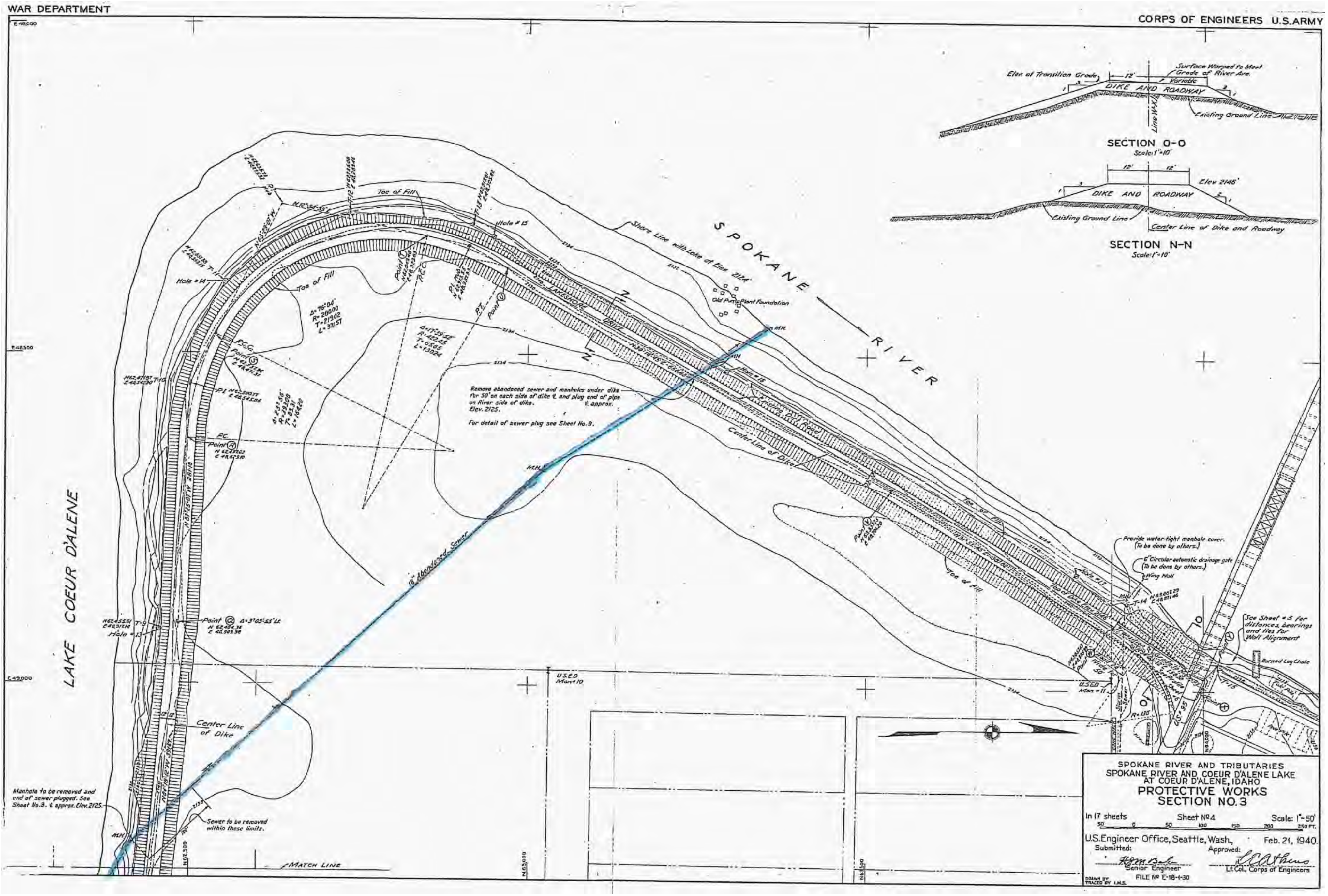
About the author

Sid Fredrickson attended high school and college in Dillon, Montana. He graduated from Western Montana College (now University of Montana – Western) in 1970 with a degree in secondary education. He holds majors in physical science and chemistry and a minor in mathematics. Sid taught public school for 3 years. Sid began his wastewater experience in July 1973 as the resident inspector on a complete rebuild of the Kalispell, Montana wastewater treatment plant. Sid spent 7 years of his 10 year tenure with a consulting engineering firm doing plant startups and operator training in western Montana. Sid has worked for the City of Coeur d'Alene since November 1986; at first as street superintendent and beginning in May 1991 as wastewater superintendent. He is married and has 2 grown children living in the city.

Appendix “A”


WAR DEPARTMENT
CORPS OF ENGINEERS U.S. ARMY
1937 36" Trunk (Interceptor) Sewer
1907 18" Trunk (Interceptor) Sewer
LAKE COEUR D'ALENE
Civic Auditorium
Freight House
Depot
Depot Park
Power Sub-station
GIBBS BYPASS HIGHWAY
GOVERNMENT WAY
MULLEN TRAIL
DIRT ROAD & WALK
FLOATING DOCK
LOG DUMP
BEGINNING OF PROJECT
36" Trunk Sewer To Sewage Disposal Plant
C.M.St.P.&P. RR
Shore Line with Lake at Elev. 2124
For detail of sewer plug see Sheet No. 9.
Approx. limits within which sewer is to be removed.
NOTE: For Elevations of Top and Bottom of Concrete Wall See Profile Sheets Nº 6 & 7 and Special Details Sheets Nº 8 & 9
SECTION F-F
SECTION G-G
TYPICAL OF WALL FROM SECTION F-F TO POINT "C"
SECTION H-H
TYPICAL OF WALL FROM POINT "F" TO MATCH LINE AND TO PARK DRIVE, SHEET 3
SECTION E-E
TYPICAL WALL FROM OPENING NO. 2 TO POINT "F"
Revised September 26, 1940, in accordance with Change Order Nº1, to substitute steel sheet piling with concrete coping for a portion of full concrete wall.
SPOKANE RIVER AND TRIBUTARIES
SPOKANE RIVER AND COEUR D'ALENE LAKE AT COEUR D'ALENE, IDAHO
PROTECTIVE WORKS
SECTION NO. 1
In 17 sheets
Sheet Nº 2
Scale: 1"=50'
U.S. Engineer Office, Seattle, Wash., Feb. 21, 1940
Submitted:
Senior Engineer
Approved:
Lt.Col., Corps of Engineers
FILE Nº E-18-1-30


WAR DEPARTMENT
CORPS OF ENGINEERS U.S. ARMY
SECTION M-M
SEC. X-X
SECTION L-L
JUNCTION OF WALL AND DIKE
SECTION K-K
SECTION J-J
TYPICAL OF WALL FROM MILITARY DRIVE TO OPENING NO. 14
SECTION I-I
TYPICAL OF WALL FROM PARK DRIVE TO MILITARY DRIVE
LAKESHORE DRIVE
FOREST DRIVE
MILITARY DRIVE
PARK DRIVE
LAKE COEUR D'ALENE
SPOKANE RIVER AND TRIBUTARIES
SPOKANE RIVER AND COEUR D'ALENE LAKE
AT COEUR D'ALENE, IDAHO
PROTECTIVE WORKS
SECTION NO. 2
In 17 sheets
Sheet Nº 3
Scale: 1"=50'
U.S. Engineer Office, Seattle, Wash.,
Feb. 21, 1940
Submitted:
Senior Engineer
Approved:
Lt.Col., Corps of Engineers
FILE Nº E-18-1-30
Revised September 26, 1940, in accordance with Change Order Nº. 1, to substitute steel sheet piling with concrete coping for portion of full concrete wall.


WAR DEPARTMENT
CORPS OF ENGINEERS U.S.ARMY
SECTION O-O
Scale: 1"=10'
DIKE AND ROADWAY
Surface Warped to Meet Grade of River Ave.
Elev. of Transition Grade
Existing Ground Line
SECTION N-N
Scale: 1"=10'
Elev 2146'
Center Line of Dike and Roadway
SPOKANE RIVER
LAKE COEUR D'ALENE
Shore Line with Lake at Elev. 2124'
Old Pump Plant Foundation
Toe of Fill
Center Line of Dike
16" Abandoned Sewer
Remove abandoned sewer and manholes under dike for 50' on each side of dike ℄ and plug end of pipe on River side of dike. ℄ approx. Elev. 2125.
For detail of sewer plug see Sheet No. 9.
Manhole to be removed and end of sewer plugged. See Sheet No. 9. ℄ approx. Elev. 2125.
Sewer to be removed within these limits.
Provide water-tight manhole cover. (To be done by others.)
6" Circular automatic drainage gate (To be done by others.)
Wing Wall
See Sheet #5 for distances, bearings and ties for Wall Alignment
Burned Log Chute
MATCH LINE
SPOKANE RIVER AND TRIBUTARIES
SPOKANE RIVER AND COEUR D'ALENE LAKE AT COEUR D'ALENE, IDAHO
PROTECTIVE WORKS
SECTION NO. 3
In 17 sheets
Sheet No 4
Scale: 1"=50'
U.S. Engineer Office, Seattle, Wash.
Feb. 21, 1940.
Submitted:
Approved:
Senior Engineer
Lt. Col., Corps of Engineers
FILE No E-18-1-30

Appendix “B”

May 1, 1979

CONSENT CALENDAR: Motion by Stone, seconded by Fields to approve the consent calendar which consisted of the following items.

1. Approval of the minutes of April 17.

2. Approval of payment of claims as presented to Council and as listed following these minutes.

3. Approval of payment ot Kootenai County $8,592.75 in regards deputy in Magistrates Court.

4. Approval of two bicycle races the weekend of May 12 & 13.

5. Approval of Building Department's recommendation to issue the following permits.

a. To Ozzie Walch a permit to add 34' on to existing building at 1027 N. 1st. Value: $15,000.

b. To Inland Empire Courier a permit to build a 40 x 40 x 12 shop at 1601 N. Second Street. Value $12,000.

c. To J.F.I., Inc. a permit to add new ceiling, bathroom, partition wall non structural changes at 503 Sherman Avenue. Value $20,000.

d. To Jim Curb A permit to install kitchen and dining facilities at 501 Sherman. Value $20,000

e. To Thomas J. Stuart a permit for alarm monitoring and residence construction phase. Value $25,000

f. To John Hunt a permit to erect a single story office building at 1801 Lincoln Way. Value $160,000.

g. To Jack Robideaux a permit for second story office addition at 1603 Sherman Avenue. Value $12,000.

SUSPENSION ON SEWER MORATORIUM: The Administrator related that the staff was recommending that the Council rescind their previous action, (the City was to submit all building permits to Health & Welfare for approval) and instead follow the latest health and welfare instruction (as per letter included with these minutes).

Motion by Koep, seconded by Fields to approve. Carried.

Recd 4:00 p.m. 4/19/79 9

STATE OF IDAHO

DEPARTMENT OF HEALTH AND WELFARE

Division of Environment
2110 Ironwood Parkway
Coeur d'Alene, Idaho 83814
April 19, 1979

Mr. William D. McFarland
City Attorney
CITY OF COEUR D'ALENE
City Hall
Coeur d'Alene, Idaho 83814

Dear Mr. McFarland:

Your letter of April 19, 1979, states your opinion that the City of Coeur d'Alene does not have the legal authority to suspend service connections to existing sewer mains.

We understand that a similar issue involving the City of Ketchum (Sun Valley) resulted in a court of law ruling that the city was legally obligated to provide the continuation of such service to its citizens. Your opinion is consistent with that judgment.

In our letter of February 27, 1979, we clearly acknowledged the City of Coeur d'Alene's jurisdiction over such connections. With the exception of an imminent hazard to public health (which we have not determined exists at this date), it is not the intention of this agency to interfere with the City's legal right to exercise this obligation to its citizens. We, therefore, honor your duty to continue service connections to the present sewer collection system and to those system expansions that have been previously approved by this office.

In respect to this opinion, and in reference to our earlier letter, we again request that the City develop a written policy to address the cumulative effect these future connections will have on the present sewage treatment plant. The goal of this policy should demonstrate the City's best efforts to cope with the current hydraulic overloading problem and to mitigate as best and quickly as it can the impact anticipated from these continued connections.

We suggest that this policy be the subject of a draft document prepared by the City's committee currently addressing this issue. They should prepare a written proposal that includes specific, approvable plans and deadlines to correct the overloading problem. Following City Council review and adoption, this proposal would be endorsed by the Idaho Board of Health and Welfare as a compliance schedule. Faithful implementation of the correction schedule would be a condition of the State's approval.

5-1-79

Among items that should be addressed by the committee for inclusion in the correction proposal are, as follows:

1. Continued active involvement by the City of Coeur d'Alene in the sewage grants program that may lead to construction of a new sewage treatment facility in several years.

2. Minor changes that the City can make now to improve the treatment capacity at the present facility.

3. A major key to mitigating the impact of continued connections is early implementation of a plan for storm water elimination from the sewage collection system. Funding for this correction may be available from several federal sources, possibly from the state, from a sewage "tap fee" program or a combination of all three.

4. The City should adopt a sewage "tap fee" schedule in addition to its normal service connection fees that realistically pays for capacity at the future or existing treatment facility.

5. Have the City adopt an ordinance to prohibit extraneous inflow of water from such controllable sources as cooling water, rain-collecting downspouts, etc. that currently impact the sanitary sewer system.

6. Improve the management program at the existing treatment plant by preparation of a written manual outlining regularly scheduled operation and maintenance practices.

7. Demonstrate an improved and quality controlled chemical analytical program for the present plant's operations.

8. Mount a program to identify those Coeur d'Alene residences that are still on septic tanks and are located adjacent to the sewer collection system. At a later date, when capacity is available, these properties should be connected to the system.

9. To further mitigate the impact on the present treatment plant, the City should ban any future zoning changes that would increase population densities. This ban should remain in effect until additional treatment capacity is available.

Your continued cooperation with this office is appreciated.

Sincerely,

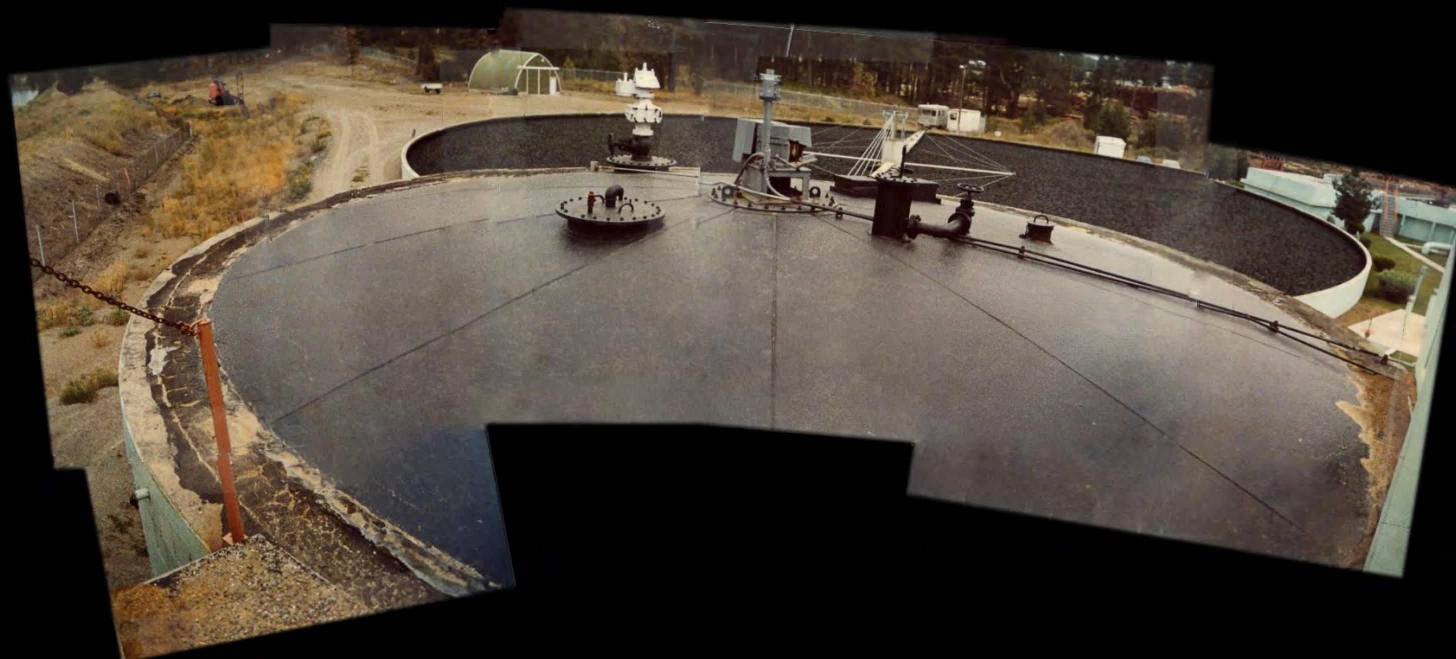
DIVISION OF ENVIRONMENT

M. Christie

Michael Christie
Regional Supervisor

MC:nj
cc: Mayor Don Johnston ✓
Gene McAdams
Tom Wells
Lee Stokes
EPA - IOO
5-1-79

Appendix “C”



Secondary Digester Cover
1981

Gravity Thickener

1981

Plant Entrance

1981

Exterior view from thickener showing sludge pump house and digesters

1981

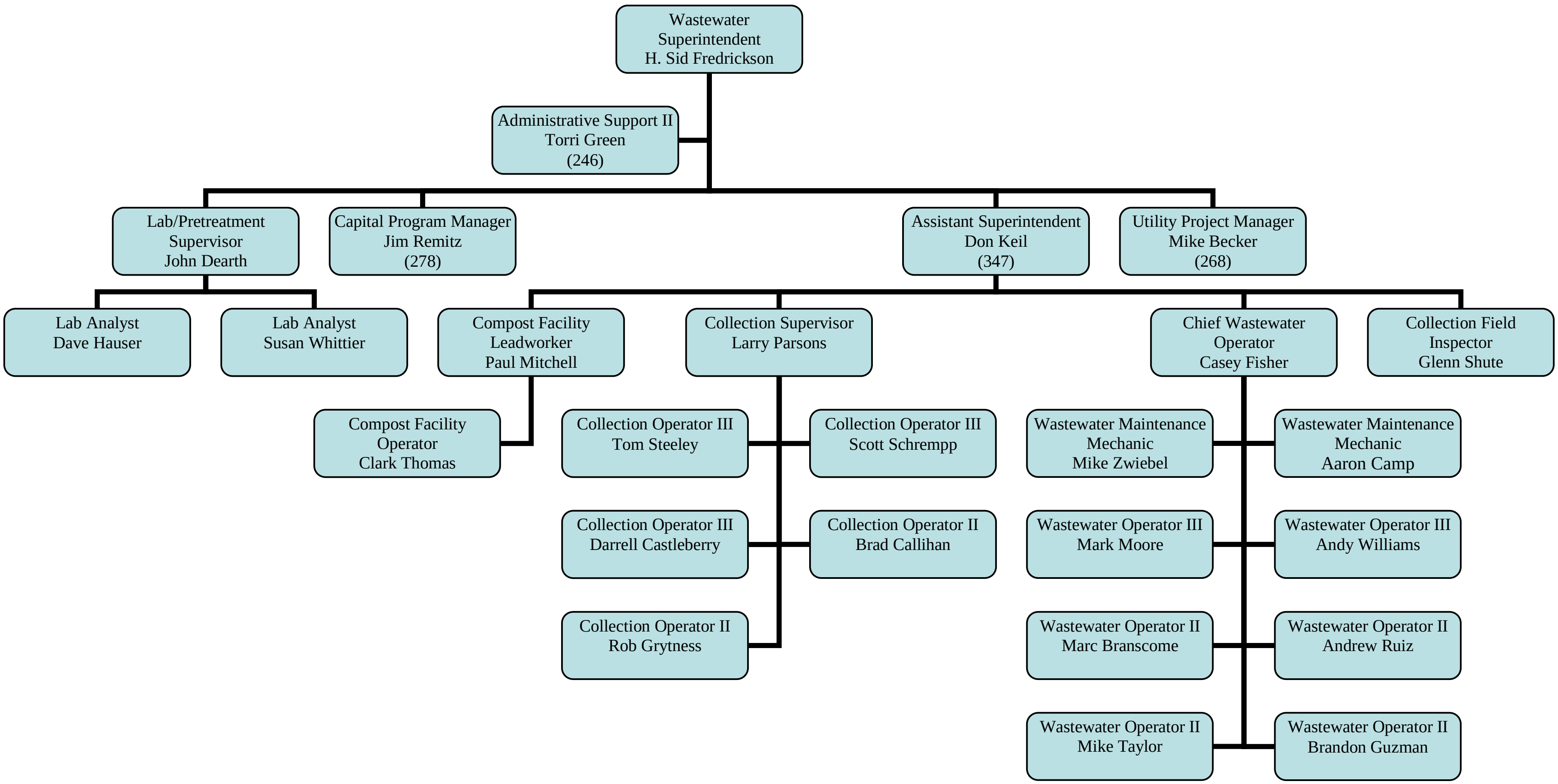
Southwest Plant Corner

1981

View from top of Primary Clarifier

1981

Appendix “D”



Revised 3/30/16