

Mark Quarles and Scott Vick Notes of Meeting June 7, 2001

Meeting 1: 9:00 AM Meeting with County: Jim Lunn, Landfill Director and Jason Repsher, Gresham, Smith and Partners (consultant to the County); Scott Vick and Mark Quarles, TTEMI; and Brenda Apple, TDEC observer

Meeting 2: 1:00 PM Meeting with County: Gene Johnson, City Water Department; Bruce Trotter, Water Plant Operator; Neal Westerman, James C. Hailey and Co. (consultant to the City); Alton Brown, City Administrator; and Brenda Apple, TDEC Observer

**List of Questions for Discussion
City of Dickson / Dickson County**

Well Field /Distribution System Installation and Operation

1. When was the well field installed and why?

Meeting 2: The wells were installed for a water supply in the early 1980s.

Meeting 2: USGS installed the well field to identify aquifers that will yield sufficient flow for a drinking water source.

2. Describe what was done to prepare them for use after installation.

Meeting 2: Nothing other than determining the pump rate of each.

3. Were pump tests or chemical sampling performed at any time?

Meeting 1: The USGS did a pump test of DK-21 in December 1997.

Meeting 2: The only thing was routine tests that the USGS would have done.

4. Describe how the municipal well field is operated? When (if ever) has the well field been in use? What wells were used?

Meeting 2: All of the wells that were not put into use were not closed, and the wells and the associated property were reverted back to the property owners.

Meeting 2: City selected two wells DK-21 and DK-17 to use for water wells. All others were "given" to the property owner.

Meeting 2: DK-17 and DK-21 used as water supply wells for the city of Dickson.

5. What percentage per day (not percentage per year average), worstcase scenario, is all water obtained from either City Lake or Wells?

Meeting 2: DK-21 was used exclusively with City Lake from November to May, providing around 300 gpm with the 1,000 gpm (up to 1,100 or so, depending on whether or not the water flows by gravity or is pumped) from City Lake. Also, 250,000 gpd was taken from Turnbull Utilities for the total gallons per day.

Meeting 2: From 1979 or 1980 until December 1996, city lake and wells were used during November through May. DK-21 pumps 300 gpm of 1,400 gpm total. DK-21 and DK-17 rotated weekly.

6. Describe when / how / by whom any known pumping tests are conducted (DK-21 3 days starting on December 15, 1980; DK-17 3 days November 1980 and 8 hours August 1981; TDEC said that DK-21 was pumped for 30 days starting around January 1997. Why?). Also, TDEC said pumped water pumped to City Lake.

Meeting 1: Jason believes that well was pumped for a 30-day period (other than turning off on the weekends during the period) by the USGS in an attempt to "Draw" water to the well during the dye study. The water was discharged to an unnamed tributary to Worley Furnace Hollow / Creek.

Meeting 2: DK-21 was pumped by the USGS in January 1997, not by the City. They later said that well DK-21 was sampled sometime after December 1997 sampling of the raw water and resampling in February 1998. They did not mention that a pump test was performed by the City in January 1997.

7. What was done in response to contaminants being reported in the samples from Dale Donagan (MEK, 10/988), Harry Holt (TCE, 10/88 DSWM), and Lavenia Holt (MEK, 10/88, DSWM).

Meeting 1: Jim and Jason believe that there was periodic sampling and the homes were put on City water.

8. What is the amount of known drawdown? Any reports of private wells drying up during the period?
9. When pumping DK-21 (or any other well), was there ever a time when that water was pumped to the City Lake? What did happen to the water?

Meeting 1: the water was pumped to the ground surface and flowed to an unnamed tributary of Worley Furnace Creek.

Meeting 2: It is physically impossible for water to be pumped to City Lake because of check valves and piping will not allow.

10. When was City Lake first sampled for VOCs?

Meeting 2: They believe the well was sampled sometime around December 1997 (data suggests 1996).

Meeting 2: Sampled a second time approximately February 1997.

11. When was first well head protection plan developed? Last updated? Well head plan lists three wells (DK-21, DK-17, and DK-1). Which are / were used?

Meeting 2: The plan has not been updated since they are not using the well.

12. What was done in response to occurrence of TCE in potable water? When first observed? When first sampled? Frequency then and now?

Meeting 2: DK-21 was shut down in "early" 1997 when sampling indicated VOCs in the finished water (and subsequent resampling in February 1998) and then subsequent up-pipe sampling showed VOCs in the well. (This statement contradicts No.14 in that VOC sampling of finished water was done in December 1997. Subsequent uppipe sampling was done after another hit in February.)

Meeting 2: Removed well/city lake from service (positive TCE in finish water). Resampled February 1997.

13. What is the chronological expansion of water service? Maps?

Meeting 2: the City Lake and the well field were the main supplies up until around 1986. One well "went out of service" in around 1991. A map was received by Neal that shows the distribution but not by time. He is to get with me to provide the information.

14. What are the raw water sources? Take from all at the same time? Does one supply an area more than another (e.g. Dickson Lake supplies West Piney Utility District EPA Preliminary Assessment, 1986). Describe the operation past and present relative to one another.

Meeting 2: DK-17 was used until the late 1980s until pump malfunction caused them to stop using it. It pumped a lot of sand. DK-21 was pumped fulltime from its installation until 1986 when the plant was upgraded and the Piney River intake was installed. It was pumped part-time from 1986 until 1997 when it was shut down after VOCs were detected. In March 2000, they tried to bring it online following aerator construction after sampling for the last two years (annual VOC sampling per their permit) did not indicate VOCs. They foresaw "no problems".

Meeting 2: The City buys water from the Turnbull Utility District at 250,000 gpd. Initially, water was "bought" but not used because the utility had to have a "Customer" to warrants its creation. They actually started using their allotment in the early 1980s. In 1986, they upgraded the water plant from 1.0 to 2.0 mgd.

Meeting 2: The Piney River is used from June to November. From November to May, they used City Lake and DK-21. DK-21 was used to "dilute" high manganese and iron found in City Lake. They have approval from DWS to build an upgrade to 4 mgd and to upgrade the Piney intake to 4 mgd. They do not expect to use City Lake until they get the 4 mgd upgrade cause they need water to dilute the Lake (DK-21 used to do it).

Meeting 2: DK-21 was used regularly from the time of its installation until early 1997 when the well was shut off (after sampling at the water plant indicated VOCs and subsequent testing of the well in response indicated it was contaminated). "Trace" TCE was identified in finished water during routine annual VOC sampling in December 1996. It was resampled in February 1997 but it was "not above the limit". At that time, they sampled City Lake and DK-21 and found contamination in DK-21.

Meeting 2: The City has proposed to use Well DK-15 (located to the south of DK-21 but still in the area of the landfill) as a potable water supply. It is in a sand aquifer. They also have drilled a well at the Piney River intake (275 gpm).

Meeting 2: When I asked them about a well referred to by Janet, the County Executive, they responded that the City was not aware of any efforts by the county to develop a well for potable water.

Meeting 2: They want to develop DK-15 as a potable water supply. It is in a sand aquifer. DK-15 is located to the south of DK-21, but in the area of the landfill.

Meeting 2: Currently - Piney River, 2 mgd. Purchase 200,000 gpd from Turnbull Utility District. From 1979/1980 until February 1997 City Lake/DK wells used November to May.

15. Who supplies water to what areas? What utility district supplies water to the area around the landfill?

Meeting 2: They supplied a map with utility coverage. The City buys 250,000 gpd from Turnbull Utility District. They get the water from Turnbull Creek. Started back in the early 1970s. It enters the system and then goes to a holding tank near the entry point. The Harpeth Utility District used to get water from a spring (taken out of service in 1990), but now gets it from Turnbull and the City (around 100,000 gpd). The Tennessee City/Sylvia District had always bought water from the City of Dickson. They supply some isolated areas around Van Leer. The City bought the West Piney District in 1998. Up until that time, the City had supplied

them all of their water. The City Industrial Plant area is supplied water from Turnbull.

16. What has been done and when for those areas with known contamination (e.g. Sullivan Spring, Furnace Hollow, and Holt well).

Meeting 1: They were supplied with public water.

17. How often do they experience filter maintenance? When maintenance is being done, what filtration rate is common for the other filters? What is their design filtration capacity?

Meeting 2: the City operated three filters before the 1986 upgrade at 2 gpm/square foot and three afterwards at 4 gpm/square foot. This was mainly an "administrative change" in 1986 during the plant upgrade because the filters were already capable of the rate.

Meeting 2: 1986 – Filters (3) upgraded to 4 gpm / ft² (2 mgd).

18. What treatment processes are present and when were they installed (particularly around end of 1996 and through April 1997)?

Meeting 2: In 1986, the plant was upgraded from 1 to 2.0 mgd. They added or upgraded chemical feed, flocculation, and sedimentation basins. They also added aeration to remove TCE. They tried to test its performance during March 2000 while pumping DK-21 for a 2-week period.

Meeting 2: Induced draft aerator installed ≈ 2000. No other changes since 1986.

19. Any filter repairs during the end of 1996 and through April 1997? If so, what was the filter rate?

Meeting 2: The only thing that would have been different would have been the flocculation / filter rate.

20. Where is the Buckner Park well and what is it used for?

Meeting 2: The park is located just north of the City Lake. It is the park where basefield, etc are located. They were not aware of a well at that park.

Meeting 2: The presence and use of the well was unknown.

21. Where is the Ice Plant well and is it still used?

Meeting 2: Paul Larkins owns and operates an Ice Plant which is located downtown adjacent to the railroad track. He did (and may still does) use the well for water to make ice. Paul makes ice during the summer and hauls coal (in the past) in the winter.

Sampling

1. What sampling has been done for ANY of the wells since their installation?

Meeting 2: Other than what VOCs for DK-21, the only typical monitoring would have been done by USGS that may have been done during well installation.

2. Public hearing for landfill expansion (September 19, 1988 summary memo from DSWM) talked about "...City monitors water quality at their well approximately 1000 feet NE of the landfill and at the confluence of West and East Piney Rivers. Their sampling does not indicate any contamination from the existing landfill." What sampling results were used for this statement? VOCs included?

3. When first sampled for VOCs and SOCs? Copy of all results. Note detection limits.

Meeting 2: They started sampling finished water for VOCs "since EPA started that requirement". Since they used both the City Lake/DK-21 and the Piney River for water during 2 six-month periods during the year, they collected two finished water samples each year (one from each source group). Barry is to provide VOC data for the wells and City Lake.

Meeting 2: VOCs were first detected in finished water when a "trace" was detected in the finished water and found again in February 1997. They then started sampling at the City Lake and DK-21.

4. Where specifically are water samples collected (e.g, Well Lake (12/9/96), Entry Point A (2/24/97 TCE hit), Entry Point (12/05/00), City Lake A (4/7/97) and Raw Water Lake (4/21/97), 125 Robinson Road (4/21/97), 125 Pond (4/21/97), Entry Point Water Plant (8/19/97), DK-21 (4/21/97), Armstrong Well (4/21/97), Pond Plant (4/21/97)).

Meeting 2: Any sampling point with an "A" designation usually means the Piney River. Any "B" designation typically means the City Lake / DK-21 source. "Entry Point" typically means "at the plant" and its entry point into the distribution system as finished water.

Meeting 2: Sampling at the individual residences was done at various points within the distribution system as a response to the VOCs that were detected in finished water. The sampling was done in early 1997 because VOCs were

detected in finished water in February 1998 (data seems to indicate that this was February 1997). Sampling of the Armstrong well was done because he is the property owner of the land on which DK-21 is owned. He was concerned that his private well was contaminated. Also, the "pond" sample was collected from a pond on some residents property.

Meeting 2: Bruce and Neal believe that TCE was first detected in the finished water in 1996, not December 1997 as previously stated.

Meeting 2: They normally do not test raw water for VOCs.

Meeting 2: Bruce collected the "raw water lake" sample from the lake along the bank near the dam. The sample was collected from the surface. The sample was not collected from the intake.

Meeting 2: They stated that "at no time" did finished water above the MCL went out to the distribution system.

Meeting 2: Bruce seemed unclear on exactly where each sample was collected because there are differences in what they call points and what the lab calls them on the analytical reports.

5. Where has TCE been detected and when? (Pump tests on DK-21 October 13, 1994, April 1997, and when else (February 24, 1997 after one-month pump test))?

Meeting 2: TCE was detected in the finished water in December 1996 and resampling in February 1997. They did not mention that a pump test was performed along with the February 1997 sampling event.

Meeting 2: Finish Water December 1996.

6. Results of TCE sampling that indicate ability to treat to remove.

Meeting 2: They tried to re-start DK-21 in March 2000 to test the aerator. They said that they never tested the well during that time.

Meeting 2: None performed.

7. What constituted the mass VOC sampling in 1997?

Meeting 2: The mass sampling occurred in response to the detection of TCE in the finished water (which seems to suggest that it was detected in December 1996).

8. Have all DK wells been sampled?

Meeting 2: No.

Meeting 2: No, only DK-21.

9. In the October 27, 200 letter from the City Administrator to Eileen Norman, what sampling efforts are they aware of to make the following statement: ... there have been no volatile organic chemicals distributed to consumers through the city's water supply"?

Meeting 2: Mr. Alton Brown stated that no sampling of the lake or residence was sampled. In his opinion, there was no reason to be concerned because TDEC Division of Air Pollution Control had done an air study that did not indicate that there was a problem.

Meeting 2: Mr. Brown's comment about no VOCs in the water was based upon Chuck Head's comments regarding the quality of the drinking water.

10. What is / was Eileen Norman's source of potable water and was her source sampled? When provided with City water?

Meeting 2: As above in No. 9, no sampling was performed.

11. What would they attribute the TCE in the City Lake to?

Meeting 2: They have no reason to suggest why it could be there. Their well head protection plan does not consider manufacturing plant contamination, even though the manufacturing plant adjacent to the lake (was at one time Winner Boat, and is now Tennsco).

Meeting 2: Bruce said that they have sampling results for VOCs that are available for the City Lake. He is to provide all data to Mark Quarles. He said that the results are always submitted to the State.

Meeting 2: TCE reportedly has not been identified in City Lake.

12. Sampling results been used to update the Well Head Protection Plan?

Meeting 2: The well head plan has not been updated since they do not use the well. They did say that they plan to use the well in emergency situations (they defined an emergency as a spill that requires shutting down the Piney River intake.

Landfill

1. What is the installation and operation history of the landfill?

Meeting 1: The City operated and owned the oldest portion of the landfill. The City then gave the land to the County in exchange for free tipping fees. The tipping fees are now questioned. The County believes that this agreement should not be perpetual. This is the hold-up for the leachate line hookup negotiation. The Subtitle D balefill has been closed. They have a remediation plan in with the state to cap the old unlined portion of the County landfill.

Meeting 1: Jim started his position in 1992. At that time, the footprint for the Subtitle D balefill "had been laid". At that time Gardner Engineering was doing the water sampling. Jim acknowledged the lack of consistency and questionable work of Gardner.

Meeting : First operated by city - accepted all types of waste to include TCE containing waste. In approximately 1972 - the county began operating the County Landfill and was given the City Dump and land in exchange for allowing the city not to be charged for tipping fees. 1994 - TCE found in Sullivan Spring. 1994 - Placed in assessment monitoring. Have not met assessment monitoring requirements.

2. What amount of access control was present?
3. What private wells in the area of the landfill are contaminated with TCE? When? What has been the City / County response?

Meeting 1: Known contaminated wells are the Holt wells. G,S&P acknowledged purging errors for past sampling of private wells that may have provided erroneous results. Once better purging was initiated, they have had VOC detections since. They said that the Holt wells are sampled quarterly with the results being forwarded to the State.

Meeting 1: Sullivan Springs, 199,; J. Holt, H. Holt, R. Holt--Placed on city water. Holt told by TDEC (in letter) that well water was safe to drink

4. Who installed the original four wells? Drilling logs or well construction diagrams?

Meeting 1: The wells are of questionable construction, and the logs are generally not available.

5. How confident are they in knowing the direction of groundwater flow?

Meeting 1: They are not confident in the direction of groundwater flow, particularly to the northwest. They acknowledge that some the wells installed by

the USGS are not installed properly and that they probably missed the first water-bearing zone.

Meeting 1: Jason Repsher stated that the direction of GW flow has not been established, but is assumed to flow NW toward Sullivan Springs.

6. Status of the leachate recovery /mitigation efforts?

Meeting 1: They have no plans to install a constructed wetlands for leachate treatment since they are planning on sending the leachate to the POTW. There are also no plans for the previously approved dual phase extraction system. The current plan of action is to install a series of leachate recovery trenches around portions of the City and County landfills. Those trenches will flow to a common sump and pump station. The current sump for the old County landfill is at the SW corner. Until the leachate is acceptable for City POTW treatment, they can haul and dispose of the leachate.

Meeting 2: They have sampled leachate recovery wells in the past. Sampling for SVOCs have not shown detections. Therefore, they have argued (and got approval) to not sample for SVOCs in the current and future groundwater assessment activities.

Meeting 1: Currently shipping leachate off-site for disposal. The County has installed a collection system for the city dump and county dump. Both of these discharge to a single pumping station. This discharges into a force main for disposal to the waste water treatment plant. The city has yet to allow the county to connect to the sanitary sewer system. Currently, the landfill cannot keep up with the leachate. They need to be connected to the waste water treatment plant.

7. Monitoring frequency of any off-site well locations? Where are they?

Meeting 1: They said that the Holt ("J" also known as "Lavenia", "R", and "Harry"). wells are sampled quarterly with the results being forwarded to the State. The Sullivan well is not sampled regularly because they are on City water. They believe the Harry Holt well was installed in 1986, and the Lavenia well was installed in 1983.

Meeting 1: MW-1 (installed in 1989) went dry in 1994. So, MW-1A (installed in 1990 or 1991) was installed.

Meeting 1: They have only been sampling and reporting semi-annually "while G,S&P gets caught up" in their review and implementation of data / design.

Meeting 1: Three Holt wells – quarterly per J. Repsher. Southeast of dump.

8. What has been done to identify well users in the area?

Meeting 1: Nothing beyond assessment drive-by survey and sampling of wells known to be contaminated.

9. Status of assessment monitoring? Proposed corrective actions?

Meeting 1: Regarding cadmium concentrations above the MCL in several wells to the northwest, they have not initiated downgradient delineation because TDEC has not requested it.

Meeting 1: Sampling is not being performed for SVOCs because sampling of leachate did indicate their presence.

Meeting 1: Sampling Sullivan Spring as an upgradient location was Jim's idea.

Meeting 1: They believe that there may be an off-site source for contamination at the Sullivan Spring and DK-21.

Meeting 1: They do not sample nor plan to sample surface waters from the Site, even though past reports indicate VOCs from the pond effluent (they were unaware of this information). The only sampling is for iron and TSS consistent with their SWPPP.

Meeting 1: Landfill has not been fully meeting the assessment monitoring requirements. Jason was not sure if they were on quarterly or semi-annual monitoring. Some wells are sampled quarterly, some semi-annual, some for Appendix I, and others for Appendix II. Jason could not provide a set plan for the sampling.

10. Any new wells proposed or planned for the future?

Meeting 1: The recently submitted (and per Jason approved) EAP detailed well installations. None were proposed for now to the northwest so that G,S&P can understand the geology to the southeast.

Meeting 1: Gresham Smith has proposed a monitoring plan that includes installation of monitoring GW's in the SE area. The plan does not address any issues to the Northwest. Methane monitoring has revealed that landfill gas is migrating off the landfill property.

11. Who has been certifying / completing groundwater monitoring?

Meeting 1: G,S&P is now doing all of the monitoring and corrective action activities. The last event was performed in February 2001. Lennie Fottrell and Alan Spear are the State contacts.

Meeting 1: 1994 – Gardner Engineering. Now is Gresham Smith.

12. What has been done in response to the Dickson County Herald article (9/22/00) where Jim Lunn stated that “we are aware that there have been minute amounts of TCE found in a spring and have been working towards finding the source”?

Meeting 1: Their response has been the assessment monitoring and corrective actions. They also said that they send gas monitoring results to the State quarterly. Gas results along the northern property line exceed the LEL. No monitoring is done at the residences but they said that “none is going towards the homes”. They are however, proposing a gas cutoff trench in that area.

13. Purpose of MW-8 pump test of the “large conduit aquifer”?

Meeting 1: MW-8 was installed by the USGS in a 45' by 45' conduit. They installed MW-8A to conduct a pump test. They ran a pump test for 6.5 hours with no drawdown from MW-8. They do not purge MW-8 but rather MW-8A in an attempt to “pull water to” MW-8.

Meeting 1: MW-8 (2" well) installed by USGS, installed in a “mud-field” 45'X45'. MW-8A – installed for a pump test, bottom of well is ≈ 20' above the top of rock. MW-8 and MW-8A are ≈ 5' apart. MW-8A is pumped for 6 hours, MW-8 is sampled. In the dry, pumping MW-8A pulls the water across through the screen of MW-8.

14. Regarding the sampling of residences along Furnace Hollow Road. Why were only 2 parameters tested and why were the report levels so high (0.005 mg/l which is the MCL for TCE. These are > than the PQL)?

Meeting 1: They began sampling of these residents after a spring sampling event. They only analyzed for constituents for which “there was a hit”. Regarding the elevated detection limits, they did not know why they were so high. They assume that was Bob Gardner’s decision.

Meeting 1: Jason- During previous sampling, only TCE and PCE were previously identified. Therefore, only these 2 constituents were requested. Jason stated that the method No. was 8240 rather than No. 8260 and the detection level was higher than the 8260.

15. What is the status of starting pumping leachate to the City?

Meeting 1: The City is delaying their approval pending approval of the contract for future tipping fees. J.W. Luna, an attorney in Nashville, is advising the City to hold out and not agree to the contract.

General

1. Who was responsible for the request for information that individuals with knowledge of cleft palets / lips contact send a letter to "Information, P.O.Box 411, Burns, TN (September 22, 2000 Dickson Herald)? What were the results of the request?
2. What are plans for future raw water access? A new well near the Piney River? Cumberland River?

Meeting 2: The City has proposed to join with Harpeth Utilities, Turnbull Utility District, and Tennessee City to form a common water utility. If it goes through, they will get water from the Cumberland River. The Piney River upgrade will not be pursued unless this falls through. The new authority has been approved as a private act. The remaining action is Commission approval and then the Boards of each meet and vote.

Meeting 2: County wants to upgrade plant to 4 mgd. This would require upgrading the Piney River intake and installing a well near the Piney River to meet the 4 mgd demand. Three utility districts may form the greater Dickson Water Authority that will draw water from the Cumberland River and provide finished water to Dickson, Turndale, and White Bluff utility districts.

3. Who and why was the dye trace initiated?

Meeting 1: The trace was the idea of G,S&P. They gave the City a proposal to do the work for almost \$100,000. The City then said that the cost was too high. A resident of the County who also worked for the USGS was then contacted. They offered to do the work at a 50/50 split. Jason admitted that the test was doomed to fail from the beginning because of where dye was injected.

4. Industrial waste disposal comments.

Meeting 1: Jim reported that he heard a rumor that during construction of the rear entrance to Tennsco (located adjacent to the City Lake), drums were uncovered.