CAPACITY PLAN FOR
POTABLE WATER SUPPLY
CITY OF CRYSTAL SPRINGS

KUHLMAN ELECTRIC CORPORATION
CRYSTAL SPRINGS, MISSISSIPPI

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Executive Summary

This Capacity Plan has been developed as part of the Corrective Action Plan (CAP) for the Kuhlman Electric Corporation (KEC) in Crystal Springs, Mississippi. The purpose of the Capacity Plan is to comply with the March 1, 2012 Mississippi Department of Environmental Quality (MDEQ) CAP approval conditions. KEC is undertaking these efforts in cooperation with and under direction from MDEQ.

In 2000, contamination was discovered at KEC during a plant expansion and reported to MDEQ. A substantial amount of on- and off-site investigation and remediation was conducted since then by Borg Warner, a previous owner, and City Well CSW-WA7 was taken out of operation as a protective measure in 2005. Routine sampling of the operating City wells was initiated immediately following this action, and continues on a monthly basis. Two additional City wells have also been found to contain trace levels of 1,1-dichloroethene and 1,4-dioxane, contaminants associated with the KEC plume. To date, the concentrations in these wells have remained well below the Maximum Concentration Limit (MCL) or MDEQ Target Remedial Goals (TRGs).

Additional groundwater monitoring wells are sampled quarterly or semi-annually. In the fall of 2011, KEC began performing this monitoring in lieu of Borg Warner. This was shortly after Borg Warner submitted the Sixth Interim Groundwater Monitoring Report, which detailed groundwater monitoring data from 2009 through 2011. The data in this report suggested that the plume, previously thought to be stable, may be continuing to migrate south towards the City of Crystal Springs well field. Based upon this data, KEC immediately began evaluating options to address potential future capacity threats to the City of Crystal Springs municipal water supply. The Capacity Plan represents the outcome of those evaluations.

This plan provides for the interim treatment of water produced from the two existing wells with trace detections and a course of action that will provide long-term capacity without the need for treatment beyond that which is currently in place.

I. Introduction

Presented here is a conceptual plan proposed by Kuhlman Electric Corporation (KEC) to proactively address contaminant plume migration in the direction of the City of Crystal Springs (City) potable water wells.

The purpose of this plan is to comply with a condition in the Mississippi Department of Environmental Quality (MDEQ) Corrective Action Plan (CAP) approval in March 2012. The approval from MDEQ is attached in Appendix A. This plan is also intended to abate public concern with respect to the City potable water supply, proactively address new plume migration information, and plan for a long-term potable water source with comparable production volume relative to that available prior to any impact by the groundwater plume.

The submittal date was extended upon request to MDEQ to June 8, 2012. The approval letter from MDEQ is attached in Appendix A.

The plan is comprised of two major components: an interim method to treat the water now being produced by City potable water wells CSW-WA1 and CSW-WA2 and a long-term solution for making the volume of water available without additional treatment beyond that presently required comparable to that available prior to any impact of the contaminant plume.

This plan was arrived at after careful consideration of various alternatives, discussions with the City of Crystal Springs officials, the MDEQ, the Mississippi Department of Health (MDOH), and the desire on the part of KEC management to alleviate potential risk, both short and long term, to the City's potable water supply.

II. Background

The City owns and operates a potable water supply, treatment, and distribution system serving the City and nearby areas in Copiah County, MS. It is the primary source of potable and fire protection water for the residents of the City. The primary components of the City facilities currently include eight (8) fresh water supply wells, a central consolidation facility, an aeration unit, and subsequent distribution piping and systems throughout the City.

The potable water system is permitted and regulated by the MDOH who is responsible for water quality monitoring and enforcement for public potable water systems in the State of Mississippi. The wells are also permitted by MDEQ Land and Water.

A. History

In 2000, soil contamination was discovered at KEC during a plant expansion and reported to MDEQ. A substantial amount of on- and off-site investigation and remediation was conducted since then by Borg Warner (BW). The *Preliminary Groundwater Assessment Report, Kuhlman Electric Corporation, Crystal Springs, Mississippi* dated July 2004 (Martin & Slagle) consisted of the installation, sampling, and analysis of eight permanent monitoring wells on the site. The results of the 2004 investigation indicated that six of the eight monitoring wells had detectable concentrations of Volatile Organic Compounds (VOCs) in both the perched groundwater and the upper aquifer.

The *Groundwater Assessment Report, Kuhlman Electric Corporation, Crystal Springs, Mississippi* dated April 30, 2009 (Martin & Slagle) identified the source area for the impacted groundwater and delineated it within the soil under the KEC plant building. Two commingled plumes of 1,1-dichloroethene (DCE) and 1,4-dioxane (dioxane) were also delineated that extend from the source area southwest and west of the site and are in contact with the aquitard downgradient of the site. The presence of dioxane is presumed to be related to its use as a stabilizer in 1,1,1-trichloroethane in the past (i.e., well before 1999) at the KEC site. DCE is a breakdown product of 1,1,1-trichloroethane. The solvent 1,1,1-trichloroethane is no longer used at KEC. The 2009 report also indicated the southern lobe of the DCE and dioxane plumes appear to be influenced by pumping stresses of the municipal wells. As such, the municipal wells were identified as potential receptors for the groundwater plume. Five of the municipal wells are located within an area approximately 2,400 feet south and southwest, and in the general downgradient direction from the site. One municipal well located at the corner of Jackson Street and Lee Avenue is approximately 300 feet east of the site and was previously used for the City swimming pool, but this well is no longer in service due to causes unrelated to the KEC plume. Six municipal water wells were initially sampled in September 2004. The municipal wells have since been sampled periodically and are currently sampled on a monthly basis. In November 2005, results from CSW-WA7 indicated DCE at a concentration of 9.7 µg/l, which is above the MDEQ Target Remedial Goal for groundwater (TRG) of 7.0 µg/l. Subsequent sampling confirmed the previous results, and Municipal Well CSW-WA7 was taken out of service and has remained out of service since 2005.

MDEQ immediately mandated monthly sampling and reporting by BW of all remaining City wells and at the consolidation unit outflow location with analysis for VOCs and later added dioxane to the constituent list. The MDOH monitoring

requirements for public potable wells do not include these analyses. MDEQ also instituted an internal sampling program for the City wells.

This sampling schedule has been in effect since 2005. Since that time, occasional detections of DCE and dioxane at concentrations below the TRG Limit but above the Reporting Limit (RL) in CSW-WA1 and CSW-WA2 have been found. No detections of the COC above the RL or TRG Limit have been found in the final consolidation unit outflow (designated TP for treatment plant) or any of the other wells. Tables 1 and 2 list the results of available well and CSW-TP samples since inception of the sampling program.

As part of the groundwater assessment, BW installed 38 monitoring wells to provide delineation of the groundwater contaminant plume. Environmental Management Services, Inc. (EMS) installed five additional monitoring wells on behalf of KEC in October 2011. The initial wells were sampled on a quarterly schedule until 2011 when a semi-annual schedule was adopted. Reports detailing the results of the monitoring were generated and a Groundwater Corrective Action Plan was prepared by Arcadis on behalf of BW and approved by MDEQ in March 2012. The conditional approval is included in Appendix A.

B. Recent Monitoring

The data in the Sixth Interim Groundwater Assessment Report by Borg Warner (Peel, 2011) suggested that the plume, previously thought to be stable, may be continuing to migrate south towards the City of Crystal Springs well field. The data presented in the Semi-Annual Groundwater Assessment Report, Kuhlman Electric Corporation, Crystal Springs, Mississippi dated January 3, 2012 (EMS) also indicated that the groundwater contamination plume appeared to be slowly migrating to the south and slightly east toward the municipal wells located in that vicinity. During the October 2011 sampling event, DCE was detected at or above its MDEQ TRG in 17 of 38 groundwater monitoring wells. Dioxane was detected at or above its MDEQ TRG in six of the 38 groundwater monitoring wells (See Figure 2 and Figure 3).

Monitoring of the groundwater contaminant plume has indicated that the concentrations of the COC within the plume have varied over time. Uncertainty exists with respect to potential future threats to two wells that already have low concentration detections. Of the five new monitoring wells that were installed by KEC in late 2011, one was positioned within the edge of the contaminant plume in the potential migration pathway toward these two wells. This monitoring well

and others nearby are being used as sentinel wells due to their locations with respect to the two wells.

C. Transition

The groundwater assessment, associated monitoring, development of the CAP, and implementation of that plan has historically been performed by BW. KEC is currently performing these functions, with the exception of the following:

In a letter dated October 11, 2011, (contained in Appendix B) BW updated the status of their involvement at the Crystal Springs site to MDEQ. In this letter, BW noticed MDEQ that:

- "BW will continue to monitor Crystal Springs' drinking water supply wells and supply lines on a monthly basis and will continue to provide the resulting data to MDEQ";
- "BW will continue to pay for the replacement of City Well No. 7 with a new supply well".

No further public commitment by BW has been made with respect to groundwater or impacts to the City wells.

In the fall of 2011, KEC directed EMS to begin the development of a capacity plan to address concerns with respect to potential further impacts to the City water supply. Accordingly, EMS began research and development of options to provide alternatives for the water supply to the city in the event that contaminant concentrations increased in the operating City wells to levels that exceeded the TRGs.

On March 1, 2012 MDEQ formally required the submission of a written capacity plan to address the concerns related to potential threats to the City water supply as part of the CAP approval. The letter is attached in Appendix A. This proposed plan is presented to meet the MDEQ requirement. Given the nature of the subject plan, agreement on the plan elements will be necessary between MDEQ, the City of Crystal Springs, the MDOH, and KEC before implementation is possible.

III. Interim Actions

Since the initial investigatory report of the impact to groundwater at the KEC facility in 2004 by BW, the groundwater investigation and definition of the extent of the groundwater contaminant plume progressed in stages. During the same time period, an investigation was initiated to determine the source of the release. The final groundwater assessment report was submitted to MDEQ by BW on

April 2009 and was used as a basis for the development of a CAP submitted to MDEQ on March 15, 2011.

Specific Actions

The following actions were taken:

- Shut down of CSW-WA7 in November 2005
- Installation, in stages, of an array of plume definition and monitor wells (43)
- Investigation via use of a Waterloo Profiler for definition guidance
- Monthly sampling of City wells
- Quarterly sampling of all monitor wells (later semi-annual in 2011)
- Reporting of monitoring well results and monitoring of plume migration
- Water well survey(s)
- Soil and vapor sampling beneath KEC facility
- Corrective Action Plan development for groundwater and source area including Soil Vapor Extraction (SVE), Air Sparging (AS), and Monitored Natural Attenuation (MNA)
- Planning for a replacement of CSW-WA7 with new well, test well evaluation is currently underway (See Figure 4)
- Community engagement activities
- Informational open house (January 2012)
- Meetings with community groups (ongoing)
- Revised SVE plan submitted to MDEQ
- CAP approval
- SVE Pilot test performed
- Meetings with City and City Engineers
    - Preliminary discussions between the City Officials, KEC, WGK, Inc. (Engineers for the City), and EMS were conducted with a common objective of seeking solutions for providing the City with a potable water source with a production volume equal to the actual volume of historical production and that is not likely to be impacted by the known groundwater plume.
- Meetings with MDOH, WGK, and EMS to resolve permitting requirements (ongoing)
- Meetings with MDEQ (ongoing)
- Water treatment technology research and evaluation
    - EMS has investigated numerous alternatives and screened technologies that would be effective given the myriad of conditions, constraints, and circumstances posed. The strategy that

is proposed was deemed the most feasible considering effectiveness, practical implementation, time required for installation, and costs.

- The constituents of concern in the vicinity of the City's potable water wells are DCE and dioxane. Many treatment options exist for removal of DCE from water, however, dioxane is recalcitrant due to its miscibility in water. Of the few options that exist for treating this contaminant, advanced oxidation using ultraviolet light has been deemed most appropriate in this case.
- Other options evaluated were chemical oxidation, carbon adsorption, and aeration. Chemical oxidation is feasible, however; was discounted due to operational costs, difficulty of control, and public perception of chemical addition. The other technologies are not deemed technically effective to achieve the desired result.

- Development of City potable water system design parameters (ongoing)

IV. Proposed Actions

The overall goal of this plan is to pursue a potable water source with comparable production volume relative to that available to the City of Crystal Springs prior to impact by the groundwater plume.

Due to the time required to responsibly achieve this goal, this plan is comprised of two elements to be pursued concurrently. They are: 1) provide interim treatment system for the water from the two existing wells with trace detections and 2) replacement, as necessary, of the volume of water relative to that available prior to impact by the groundwater plume.

The plan for the interim period until a long-term provision is fully implemented is outlined in Section A. Interim Plan – Near Term Water Treatment that follows.

Considering the long-term issues normally associated with treatment of a potable water source, a solution that does not require treatment long term and is consistent with the existing system design would be most desirable for KEC and the City. The most attractive alternative is to construct new wells as necessary at locations not likely to be impacted by the known groundwater plume.

The Section B. Volume Replacement, outlines the conditions, circumstances, information needed etc. to achieve this objective.

A. Interim Plan – Near Term Water Treatment

Objective- The timely development and implementation of an interim method to provide a volume of potable water for the City equivalent to the historical volume production rates from CSW-WA1 and CSW-WA2 that prevents exceedance of the established TRG concentration requirements for the constituents of concern until a more long-term solution is in place and functioning.

1) Proposed Technology

After evaluation of the practical alternative technologies that would be effective in removing the target constituents and that could be employed in a timely manner, the technology proposed is advanced oxidation utilizing ultraviolet light in combination with a catalyst. The system utilizes ultraviolet light to activate a titanium dioxide (TiO_2, used in paints as a pigment) catalyst which generates free radicals. Free radicals are highly reactive ions which seek to attach themselves to other present molecules and thus break those chemical bonds. In this case, the free radicals would break the chemical bonds for the DCE and dioxane and produce water and carbon dioxide. This process destroys the constituents of concern. The proprietary unit proposed is manufactured by Purifics ES Inc. and is marketed as Photo-Cat AOP+®. It is a mobile unit that can be easily installed in a temporary facility where piping is most convenient. Details of the specific unit recommended are included in Appendix C.

The system is a proven technology, does not introduce any chemicals or additives into the treated water, and requires relatively little operational and maintenance attention after startup. The capacity of the unit is easily scalable in the field making it flexible to volume needs. Discussions with the MDOH relative to this technology indicate that it would be acceptable for use in this application.

Unlike conventional methods, this treatment method is effective for both the specific constituents DCE and dioxane present in the groundwater. The enhanced oxidation induced by the exposure to intense ultraviolet light in the presence of a titanium dioxide catalyst destroys the contaminants and is one of only a few methods that effectively removes the dissimilar constituents.

2) Installation and Operation

KEC or its contractors will perform the engineering, installation, operation, and monitoring of the chosen treatment unit. Installations will be subject to approval by the designated City Engineers and compliance with City requirements. The MDOH requires a Class A Operator licensed for this type treatment system. The

operator will be provided by KEC and coordinated with existing City personnel. The MDOH requirements are provided in Appendix D.

A sampling and monitoring protocol and schedule will be developed by KEC and approved by the City Engineers and MDOH to monitor and confirm the system performance.

3) Location

A schematic of the proposed interface with the existing City supply system is shown in Appendix E.

Consultation with the City Engineers indicates that the most logical location for this unit to be tied in to the existing supply piping network is on City owned property at East Railroad Avenue. The location is shown on Figure 5. The detailed engineering, installation piping, enclosure construction, and utility provision could be completed prior to delivery of the unit. Manufacturing delivery time is estimated at four to five months following placement of the order.

4) Post Use

Upon completion of the long-term solution, the unit could be employed at or near the KEC facility to accelerate groundwater remediation by pumping and treating the impacted groundwater within the core area of highest contaminant concentrations. This could further reduce the future potential migration of contaminants toward City wells by reducing residual source area concentrations.

5) Treatment Strategy Details

An Implementation Strategy for the interim treatment is included in Appendix F.

B. Volume Replacement

The overall goal of this plan is to pursue a potable water source with comparable production volume relative to that available prior to impact by the groundwater plume.

1) Evaluation Process – Necessary Replacement Volume Determination

To accomplish this goal, an evaluation will be made of the net volume loss to the City that needs to be replaced, considering the addition of the new BW well, the potential shutdown of CSW-WA1 and CSW-WA2 (contingent upon contaminant plume trends), and the actual City usage.

Once this evaluation is performed and concurrence is achieved among the stakeholders, KEC will identify where the net needed capacity can be obtained and the necessary well or wells installed to replace the net replacement volume. An Implementation Strategy for the evaluation process is included in Appendix G.

2) Overall Area Water Demands/Capacity

Existing registered non-residential water well locations are shown on Figure 6 for Crystal Springs and surrounding areas.

The demand on the regional potable water supply is significant and permitting of any new Public Water Supply wells should consider the constraints that exist to be successful. This includes at a minimum existing demand, aquifer capacity, groundwater flow direction, and the existence of the known groundwater impact plume.

This proposed plan envisions the need to develop a conceptual groundwater model adequate to consider the existing conditions, constraints, and demand, so that general predictive indications of the influence of existing and new production from the water producing zone can be evaluated.

This information can then be used to determine potential production areas that may be suitable for the development of further capacity.

3) Alternative Sources

No practical long-term alternatives to additional water wells were found to be a viable means to furnish the replacement volume that is anticipated to be required. No fresh water surface lakes or rivers are present within a reasonable distance that would not suffer undesirable effects from functioning as a water source. No other existing public source is present with excess capacity from which additional water could be obtained.

4) Existing Facilities

It will be necessary to ascertain the design configuration of the entire City water supply system with respect to layout, sizing, capacities, etc. in order to integrate any new sources of water into the existing framework effectively. This information will need to be provided by the City to establish the base design criteria.

5) New BW Well Production

The test well for the new well that is funded by BW is currently being evaluated and, presumably, the new well to be installed will be connected to the existing piping network that links CSW-WA5 and CSW-WA6 to the main City treatment plant.

The production from this well, once operational, will be factored into the overall replacement volume determination prior to the development of the specific design criteria for any additional capacity that might be required. Continued interface with the City Engineers will be necessary to make this determination.

V. Schedules

Anticipated schedules are outlined in accompanying Gantt Charts in Appendix H for both the Interim Treatment System and the Volume Replacement.

Within these schedules are critical target milestones for the City, MDEQ, and MDOH. These schedules are contingent on timely review, adjustment, and concurrence by all interested parties.

Tables

Table 1
City of Crystal Springs Municipal Well
Sampling Results for 1,1-Dichloroethene
September 2004 through May 2012

Sample Date	Well Identification									
	CSW-WA1 On-site Lab	Duplicate (CSW-WA1) On-site Lab	CSW-WA1 Off-site Lab	Duplicate (CSW-WA1) Off-site Lab	CSW-WA2 On-site Lab	CSW-WA3[1] On-site Lab	Duplicate (CSW-WA3) On-site Lab	CSW-WA3 Off-site Lab	Duplicate (CSW-WA3) Off-site Lab	CSW-WA4[2] On-site Lab
9/7/04	<1.0	<1.0	<1.00	<1.00	<1.0	<1.0	-	-	-	<1.0
11/14/05	<1.0	-	-	-	<1.0	<1.0	-	-	-	<1.0
11/16/05	-	-	-	-	-	-	-	-	-	-
3/15/06	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.00	<1.00	<1.0
9/21/06	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.00	<1.00	NC
11/8/06	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.00	<1.00	NC
12/13/06	1.0	-	-	-	<1.0	<1.0	<1.0	<1.00	<1.00	NC
1/16/07	<1.0	<1.0	<1.00	<1.00	<1.0	<1.0	<1.0	<1.00	<1.00	NC
2/13/07	1.0	1.0	<1.00	<1.00	<1.0	<1.0	-	-	-	NC
3/13/07	<1.0	<1.0	<1.00	<1.00	<1.0	<1.0	-	-	-	NC
4/17/07	<1.0	<1.0	<1.00	<1.00	<1.0	<1.0	-	-	-	NC
5/22/07	<1.0	<1.0	<1.00	<1.00	<1.0	<1.0	-	-	-	NC
6/19/07	<1.0	<1.0	<1.00	<1.00	<1.0	<1.0	-	-	-	NC
7/17/07	<1.0	<1.0	<1.00	<1.00	<1.0	<1.0	-	-	-	NC
8/14/07	<1.0	<1.0	<1.00	<1.00	<1.0	<1.0	-	-	-	NC
9/11/07	<1.0	<1.0	<1.00	<1.00	<1.0	<1.0	-	-	-	NC
10/10/07	<1.0	<1.0	<1.00	<1.00	<1.0	<1.0	-	-	-	NC
11/6/07	<1.0	<1.0	<1.00	<1.00	<1.0	<1.0	-	-	-	NC
12/11/07	<1.0	<1.0	<1.00	<1.00	<1.0	<1.0	-	-	-	NC
1/9/08	<1.0	<1.0	<1.00	1.1	<1.0	<1.0	-	-	-	NC
2/12/08	<1.0	<1.0	0.93	1.0	<1.0	<1.0	-	-	-	NC
3/4/08	<1.0	<1.0	1.1	1.1	<1.0	<1.0	-	-	-	NC
4/1/08	1.1	1.2	1.3	1.3	<1.0	<1.0	-	-	-	NC
5/6/08	1.1	1.1	1.4	1.4	<1.0	<1.0	-	-	-	NC
6/10/08	1.3	1.4	0.97	1.2	<1.0	<1.0	-	-	-	NC
7/8/08	1.2	1.1	1.2	1.5	<1.0	<1.0	-	-	-	NC
8/5/08	1.4	1.4	1.2	<0.5	<1.0	<1.0	-	-	-	NC
9/9/08	1.2	1.3	1.4	1.4	<1.0	<1.0	-	-	-	NC
10/14/08	1.1	1.1	1.4	1.3	<1.0	<1.0	-	-	-	NC
11/12/08	<1.0	<1.0	<0.5	<0.5	<1.0	<1.0	-	-	-	NC
12/2/08	1.4	1.3	1.7	1.7	<1.0	<1.0	-	-	-	NC

Table 1
City of Crystal Springs Municipal Well
Sampling Results for 1,1-Dichloroethene
September 2004 through May 2012

Sample Date	Well Identification									
	CSW-WA5 On-site Lab	CSW-WA6 On-site Lab	CSW-WA7[3,4] On-site Lab	Duplicate (CSW-WA7) On-site Lab	CSW-WA7 Off-site Lab	Duplicate (CSW-WA7) Off-site Lab	CSW-WA8 On-site Lab	CSW-TP On-site Lab	CSW-TP Off-site Lab	Pool Well[5] On-site Lab
9/7/04	-	-	3.2	-	-	-	-	-	-	<1.0
11/14/05	-	-	**9.7**	-	**10.1**	**10.2**	-	<1.0	-	NC
11/16/05	-	-	**8.7**	**8.8**	**10.5**	**10.6**	-	-	<1.00	NC
3/15/06	-	-	-	-	-	-	<1.0	<1.0	-	NC
9/21/06	-	-	-	-	-	-	<1.0	<1.0	<1.00	NC
11/8/06	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
12/13/06	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
1/16/07	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
2/13/07	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
3/13/07	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
4/17/07	<1.0	NC	-	-	-	-	<1.0	<1.0	-	NC
5/22/07	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
6/19/07	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
7/17/07	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
8/14/07	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
9/11/07	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
10/10/07	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
11/6/07	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
12/11/07	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
1/9/08	<1.0	NC	-	-	-	-	<1.0	<1.0	-	NC
2/12/08	<1.0	NC	-	-	-	-	<1.0	<1.0	-	NC
3/4/08	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
4/1/08	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
5/6/08	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
6/10/08	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
7/8/08	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
8/5/08	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
9/9/08	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
10/14/08	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
11/12/08	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
12/2/08	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC

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1/13/09	1.1	1.1	1.4	1.5	<1.0	<1.0	-	-	-	NC
2/3/09	1.5	1.4	1.5	1.5	<1.0	<1.0	-	-	-	NC
3/3/09	1.2	1.2	1.8	1.7	<1.0	<1.0	-	-	-	NC
4/7/09	1.5	1.5	2.2	2.2	<1.0	<1.0	-	-	-	NC
5/12/09	1.7	1.6	2.2	2.1	<1.0	<1.0	-	-	-	NC
6/2/09	1.8	1.8	2.3	2.5	<1.0	<1.0	-	-	-	NC
7/7/09	1.8	1.9	2.4	2.5	<1.0	<1.0	-	-	-	NC
8/4/09	1.9	1.8	2.6	2.6	<1.0	<1.0	-	-	-	NC
9/8/09	1.8	1.9	2.2	2.3	<1.0	<1.0	-	-	-	NC
10/6/09	1.9	1.9	2.4	2.4	<1.0	<1.0	-	-	-	NC
11/3/09	2.0	2.0	2.5	2.4	<1.0	<1.0	-	-	-	NC
12/1/09	2.0	2.0	2.3	2.4	<1.0	<1.0	-	-	-	NC
1/5/10	1.8	1.8	2.0	2.1	<1.0	<1.0	-	-	-	NC
2/2/10	1.4	1.5	2.0	1.9	<1.0	<1.0	-	-	-	NC
3/4/10	1.6	1.6	2.0	1.9	<1.0	<1.0	-	-	-	NC
4/13/10	1.9	1.9	2.0	2.0	<1.0	<1.0	-	-	-	NC
5/11/10	2	2	1.8	1.8	1.1	<1.0	-	-	-	NC
6/1/10	1.4	1.4	1.7	1.7	<1.0	<1.0	-	-	-	NC
7/6/10	1.9	1.9	1.8	1.7	<1.0	<1.0	-	-	-	NC
8/3/10	1.6	1.5	1.7	1.7	<1.0	<1.0	-	-	-	NC
9/7/10	1.5	1.4	1.8	1.8	<1.0	<1.0	-	-	-	NC
10/5/10	1.5	1.6	1.9	1.9	<1.0	<1.0	-	-	-	NC
11/2/10	1.4	1.5	1.7	1.7	<1.0	<1.0	-	-	-	NC
12/7/11	1.1	1.2	1.5	1.4	<1.0	<1.0	-	-	-	NC
1/4/11	1.2	1.3	1.6	1.6	<1.0	<1.0	-	-	-	NC
2/1/11	<1.0	<1.0	0.9	0.9	1	<1.0	-	-	-	NC
3/1/11	1.0	1.0	1.0	0.99	1.2	<1.0	-	-	-	NC
4/5/11	1.3	1.3	-	-	1.0	<1.0	-	-	-	NC
5/3/11	<1.0	<1.0	-	-	<1.0	<1.0	-	-	-	NC
6/7/11	<1.0	<1.0	-	-	1.2	<1.0	-	-	-	NC

Table 1
City of Crystal Springs Municipal Well
Sampling Results for 1,1-Dichloroethene
September 2004 through May 2012

Sample Date	Well Identification									
	CSW-WA5 On-site Lab	CSW-WA6 On-site Lab	CSW-WA7[3,4] On-site Lab	Duplicate (CSW-WA7) On-site Lab	CSW-WA7 Off-site Lab	Duplicate (CSW-WA7) Off-site Lab	CSW-WA8 On-site Lab	CSW-TP On-site Lab	CSW-TP Off-site Lab	Pool Well[5] On-site Lab
1/13/09	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
2/3/09	-	<1.0	-	-	-	-	<1.0	<1.0	-	NC
3/3/09	-	<1.0	-	-	-	-	<1.0	<1.0	-	NC
4/7/09	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
5/12/09	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
6/2/09	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
7/7/09	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
8/4/09	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
9/8/09	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
10/6/09	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
11/3/09	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
12/1/09	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
1/5/10	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
2/2/10	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
3/4/10	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
4/13/10	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
5/11/10	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
6/1/10	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
7/6/10	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
8/3/10	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
9/7/10	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
10/5/10	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
11/2/10	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
12/7/11	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
1/4/11	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
2/1/11	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
3/1/11	-	<1.0	-	-	-	-	<1.0	<1.0	-	NC
4/5/11	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
5/3/11	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
6/7/11	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC

Table 1
City of Crystal Springs Municipal Well
Sampling Results for 1,1-Dichloroethene
September 2004 through May 2012

Sample Date	Well Identification									
	CSW-WA1 On-site Lab	Duplicate (CSW-WA1) On-site Lab	CSW-WA1 Off-site Lab	Duplicate (CSW-WA1) Off-site Lab	CSW-WA2 On-site Lab	CSW-WA3[1] On-site Lab	Duplicate (CSW-WA3) On-site Lab	CSW-WA3 Off-site Lab	Duplicate (CSW-WA3) Off-site Lab	CSW-WA4[2] On-site Lab
7/11/11	1.4	1.4	-	-	1.4	<1.0	-	-	-	NC
8/9/11	<1.0	<1.0	-	-	1.9	<1.0	-	-	-	NC
9/14/11	1.1	1.4	-	-	2	<1.0	-	-	-	NC
10/12/11	1.5	1.8	-	-	2.5	<1.0	-	-	-	NC
11/8/11	1.5	1.3	-	-	2.2	<1.0	-	-	-	NC
12/12/11	<1.0	<1.0	-	-	1.3	<1.0	-	-	-	NC
1/9/12	1.4	1.3	-	-	1.7	<1.0	-	-	-	NC
2/13/12	1.6	1.5	-	-	1.2	<1.0	-	-	-	NC
3/12/12	1.3	1.2	-	-	<1.0	<1.0	-	-	-	NC
4/9/12	1.5	1.6	-	-	<1.0	<1.0	-	-	-	NC
5/14/12	1.3	1.4	-	-	1.2	<1.0	-	-	-	NC

Table 1
City of Crystal Springs Municipal Well
Sampling Results for 1,1-Dichloroethene
September 2004 through May 2012

Sample Date	Well Identification									
	CSW-WA5 On-site Lab	CSW-WA6 On-site Lab	CSW-WA7[3,4] On-site Lab	Duplicate (CSW-WA7) On-site Lab	CSW-WA7 Off-site Lab	Duplicate (CSW-WA7) Off-site Lab	CSW-WA8 On-site Lab	CSW-TP On-site Lab	CSW-TP Off-site Lab	Pool Well[5] On-site Lab
7/11/11	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
8/9/11	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
9/14/11	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
10/12/11	<1.0	NC	-	-	-	-	<1.0	<1.0	-	NC
11/8/11	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
12/12/11	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
1/9/12	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
2/13/12	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
3/12/12	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
4/9/12	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC
5/14/12	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	NC

1. Sample had Well ID of CSW-WA5 during the 9-7-04 sampling event
2. Sample had Well ID of CSW-WA3 during the 9-7-04 sampling event
3. Sample had Well ID of CSW-WA4 during the 9-7-04 sampling event
4. Well taken off-line by the City of Crystal Springs in November 2005
5. Sample had Well ID of CSW-WA6 during the 9-7-04 sampling event

Please note that as of April 2011 all wells are sent for analysis to the ECCS fixed base lab in Madison Wisconsin.

Concentrations reported in µg/L
A result of (-) indicates this municipal well was not sampled and/or analyzed during the specified monitoring event
NC = Sample not collected due to well pump failure
Concentrations in bold exceed their respective TRGs
CSW-TP is the final consolidation unit before distribution

Table 2
City of Crystal Springs Municipal Well
Sampling Results for 1,4-Dioxane
September 2006 through May 2012

Sample Date	Well Identification															
	CSW-WA1 On-site Lab	Duplicate CSW-WA1 On-site Lab	CSW-WA1 Off-site Lab	Duplicate CSW-WA1 Off-site Lab	CSW-WA2 On-site Lab	CSW-WA3 On-site Lab	Duplicate (CSW-WA3) On-site Lab	CSW-WA3 Off-site Lab	Duplicate (CSW-WA3) Off-site Lab	CSW-WA5 On-site Lab	CSW-WA6 On-site Lab	CSW-WA8 On-site Lab	CSW-TP On-site Lab	Duplicate (CSW-TP) On-site Lab	CSW-TP Off-site Lab	Duplicate (CSW-TP) Off-site Lab
9/21/06	<5.0	-	-	-	<5.0	<5.0	-	-	-	-	-	<5.0	<5.0	<5.0	<5.00	<5.00
11/8/06	<1.0	-	-	-	<1.0	<1.0	<1.0	<.500	<.500	<1.0	<1.0	<1.0	<1.0	-	-	-
12/13/06	<1.0	-	-	-	<1.0	<1.0	-	<.500	<.500	<1.0	<1.0	<1.0	<1.0	-	-	-
1/16/07	<1.0	<1.0	<.500	<.500	<1.0	<1.0	<1.0	<.500	<.500	<1.0	<1.0	<1.0	<1.0	-	-	-
2/13/07	<1.0	<1.0	<.500	<.500	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
3/13/07	<1.0	<1.0	<.500	<.500	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
4/17/07	<1.0	<1.0	<.500	<.500	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
5/22/07	<1.0	<1.0	<.500	<.500	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
6/19/07	<1.0	<1.0	<.500	<.500	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
7/17/07	<1.0	<1.0	<.500	<.500	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
8/14/07	<1.0	<1.0	<.500	<.500	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
9/11/07	1.3	1.3	<.500	<.500	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
10/10/07	1.3	1.3	<.500	<.500	-	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
11/6/07	1.2	1.2	<.500	<.500	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
12/11/07	1.1	1.3	<.500	<.500	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
1/9/08	1.2	1.3	1.1	1.1	<1.0	<1.0	-	-	-	<1.0	NC	<1.0	<1.0	-	-	-
2/12/08	1.0	1.0	0.77	0.85	<1.0	<1.0	-	-	-	<1.0	NC	<1.0	<1.0	-	-	-
3/4/08	1.2	1.2	0.66	0.63	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
4/1/08	1.2	1.3	0.94	0.87	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
5/6/08	1.3	1.3	1.1	1.1	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
6/10/08	1.4	1.4	0.90	0.99	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
7/8/08	1.1	1.0	0.94	0.99	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
8/5/08	1.0	1.1	0.79	0.71	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
9/9/08	1.1	1.0	0.91	0.91	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
10/14/08	1.2	1.1	0.75	0.79	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
11/12/08	<1.0	<1.0	<0.50	<0.50	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
1/13/09	1.5	1.4	1.3	0.98	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
2/3/09	1.2	1.2	0.99	0.92	<1.0	<1.0	-	-	-	-	<1.0	<1.0	<1.0	-	-	-
3/3/09	1.3	1.2	0.95	0.87	<1.0	<1.0	-	-	-	-	<1.0	<1.0	<1.0	-	-	-
4/7/09	1.2	1.0	0.84	0.83	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
5/12/09	1.0	1.0	0.86	0.85	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
6/2/09	1.0	1.1	0.89	1.2	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
7/7/09	1.2	1.2	1.1	1.2	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
8/4/09	1.3	1.3	0.99	1.2	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
9/8/09	1.2	1.1	1.1	1.2	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
10/6/09	1.2	1.1	1.20	1.3	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
11/3/09	1.3	1.3	1.2	1.2	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
12/1/09	1.1	1.1	0.92	0.81	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
1/5/10	1.2	1.2	0.77	0.84	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
2/2/10	1.1	1.1	1.1	1.0	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
3/2/10	<1.0	<1.0	0.81	0.81	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
4/13/10	1.1	1.1	1.2	1.2	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-

Table 2
City of Crystal Springs Municipal Well
Sampling Results for 1,4-Dioxane
September 2006 through May 2012

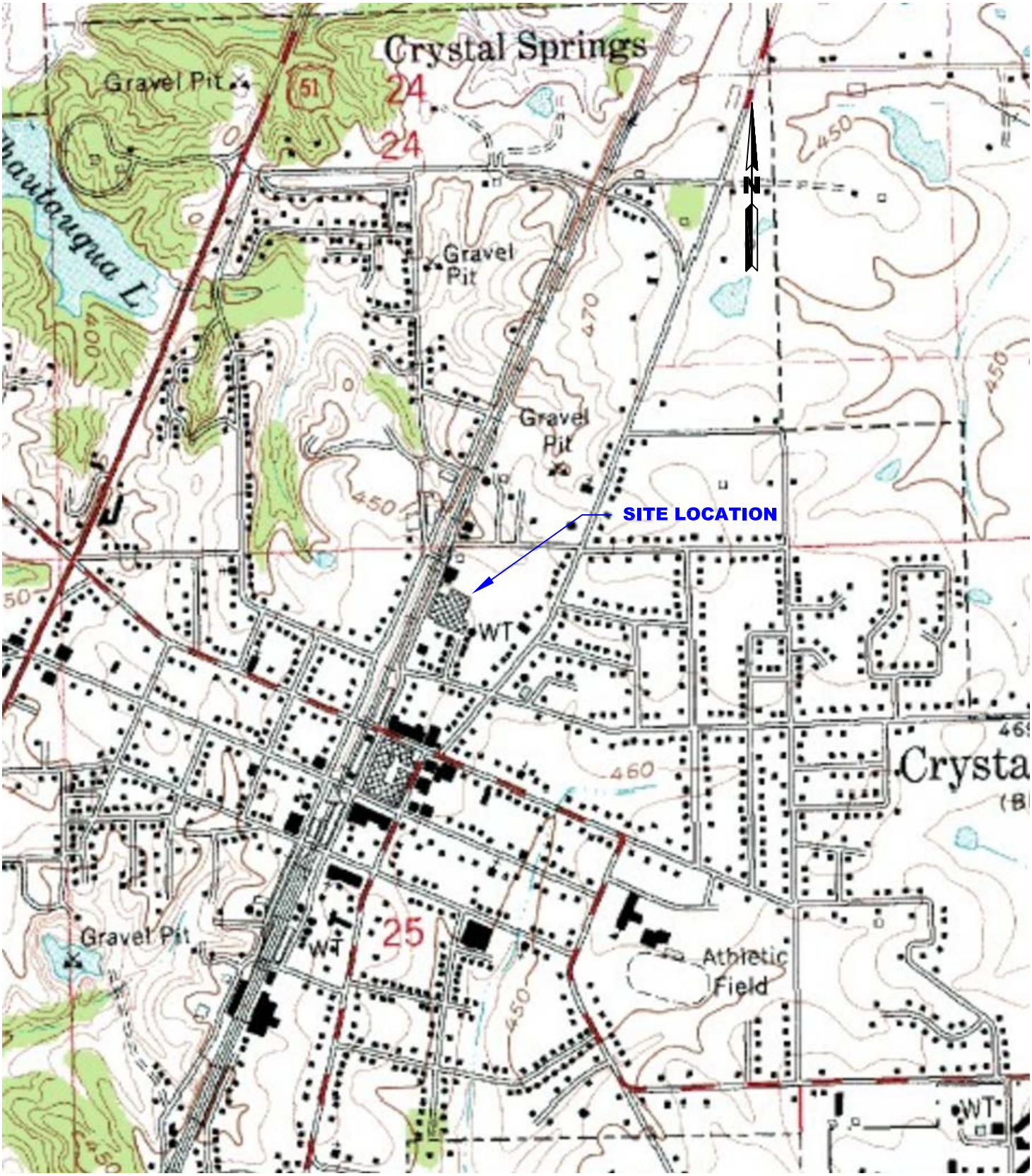
Sample Date	Well Identification															
	CSW-WA1 On-site Lab	Duplicate CSW-WA1 On-site Lab	CSW-WA1 Off-site Lab	Duplicate CSW-WA1 Off-site Lab	CSW-WA2 On-site Lab	CSW-WA3 On-site Lab	Duplicate (CSW-WA3) On-site Lab	CSW-WA3 Off-site Lab	Duplicate (CSW-WA3) Off-site Lab	CSW-WA5 On-site Lab	CSW-WA6 On-site Lab	CSW-WA8 On-site Lab	CSW-TP On-site Lab	Duplicate (CSW-TP) On-site Lab	CSW-TP Off-site Lab	Duplicate (CSW-TP) Off-site Lab
5/11/10	1.1	1.1	1.0	1.0	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
6/1/10	1.1	1.2	0.90	1.0	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
7/6/10	1.3	1.5	0.86	0.79	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
8/3/10	1.0	1.1	0.52	0.68	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
9/7/10	<1.0	<1.0	0.74	0.73	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
10/5/10	<1.0	<1.0	0.62	0.68	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
11/2/11	<1.0	<1.0	0.70	0.74	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
12/7/11	1.1	1.1	0.75	0.71	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
1/4/11	<1.0	<1.0	0.64	0.59	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
2/1/11	<1.0	<1.0	<0.50	<0.50	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
3/1/11	1.0	1.0	<0.50	<0.50	1.2	<1.0	-	-	-	-	<1.0	<1.0	<1.0	-	-	-
4/5/11	<1.0	<1.0	-	-	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
5/3/11	<1.0	<1.0	-	-	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
6/7/11	<1.0	<1.0	-	-	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
7/11/11	<1.0	<1.0	-	-	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
8/9/11	<1.0	<1.0	-	-	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
9/14/11	<1.0	<1.0	-	-	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
10/12/11	<1.0	<1.0	-	-	<1.0	<1.0	-	-	-	<1.0	NC	<1.0	<1.0	-	-	-
11/8/11	<1.0	<1.0	-	-	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
12/12/11	<1.0	<1.0	-	-	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
1/9/12	1.1	<1.0	-	-	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
2/13/12	<1.0	<1.0	-	-	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
3/12/12	1.1	1.1	-	-	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
4/9/12	<1.0	1.0	-	-	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-
5/14/12	<1.0	<1.0	-	-	<1.0	<1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-

Concentrations reported in µg/L
A result of (-) indicates sample was not collected and/or analyzed during the specified monitoring event.
NC = Sample not collected due to well pump failure

CSW-TP is the final consolidation unit before distribution

Please note that as of April 2011 all wells are sent for analysis to the ECCS fixed base lab in Madison Wisconsin.

Figures



SCALE 1 INCH = 1000 FEET

250 500 1000

0 250 500 1000 2000

REFERENCE: U.S.G.S. TOPOGRAPHIC MAP
1963 – CRYSTAL SPRINGS
7.5 MINUTE SERIES
COPIAH COUNTY, MS

NOTE: PROPERTY BOUNDARIES AND SCALE ARE APPROXIMATE.

SITE LOCATION MAP

SEMI–ANNUAL GROUNDWATER ASSESSMENT
KUHLMAN ELECTRIC BUILDING
CRYSTAL SPRINGS, MS

DATE: 05/30/12	APPROVED: BY: _____ DATE: _____	DRAWN BY: CTJ
SCALE: 1"=1000'		PROJECT NO. KUH0–12–004

ENVIRONMENTAL MANAGEMENT SERVICES, INC.

FIGURE 1

KUHLMAN ELECTRIC CORPORATION

APPROXIMATE EXTENT OF 1,1-DCE CONCENTRATIONS >7.0

APPROXIMATE EXTENT OF 1,4-DIOXANE CONCENTRATIONS >6.09

SOURCE AREA

PROPOSED TREATMENT SYSTEM LOCATION

CSW TREATMENT FACILITY

TREATMENT BUILDINGS

MW-01 CLOSED

MW-02

MW-03

MW-04

MW-05

MW-06

MW-07

MW-08

MW-09

MW-10A
MW-10B
MW-10C

MW-11A
MW-11B

MW-12

MW-13

MW-14A
MW-14B

MW-15A
MW-15B

MW-16

MW-17A
MW-17B

MW-18A
MW-18B

MW-19

MW-20A
MW-20B

MW-21A
MW-21B

MW-22

MW-23A
MW-23B

MW-24

MW-25

MW-26

MW-27

MW-28

MW-29

CSW-WA1

CSW-WA2

CSW-WA3

CSW-WA4

CSW-WA7

CAMP STREET

FULGHAM AVENUE

GLEN STREET

LAMAR STREET

LEE CIRCLE

LEE AVENUE

PEARL STREET

WEST GEORGETOWN STREET

EAST GEORGETOWN STREET

EAST MARION AVENUE

WEST MARION AVENUE

WEST CAYUGA STREET

EAST CAYUGA STREET

KIRK STREET

SOUTH AVENUE

WASHINGTON STREET

SIBBIE STREET

HORNE STREET

CHURCHILL STREET

ROOSEVELT STREET

JANET STREET

COPLEY STREET

BRENT STREET

BIRD STREET

ALLEY

DEANNE STREET

PRICE STREET

RAYMOND STREET

JACKSON STREET

SOUTH JACKSON STREET

BERNSTEIN DRIVE

STEWART

ILLINOIS CENTRAL GULF RAILROAD

EAST RAILROAD AVENUE

WEST RAILROAD AVENUE SOUTH

WEST RAILROAD AVENUE NORTH

POPPER ST

YOUNG STREET

JACKSON STREET

INDEPENDENCE STREET

FIRST STREET

GIBSON STREET

OSBORNE

LEGEND

- MONITOR WELL LOCATION
- ① MONITOR WELL LOCATION
- ② MONITOR WELL NUMBER
- SOURCE AREA
- KEC PROPERTY LINE
- KEC BUILDING FOOTPRINT
- 1,1-DICHLOROETHENE IN GROUNDWATER ABOVE TRG (7 µg/L) (OCT. 2011 DATA)
- 1,4-DIOXANE IN GROUNDWATER AT OR ABOVE TRG (6.09µg/L) (OCT. 2011 DATA)
- MUNICIPAL WATER WELL

① MW-00A ②

SCALE 1 INCH = 400 FEET

0 100 200 400 800

GROUNDWATER PLUME MAP
MAP BASED ON TRGs

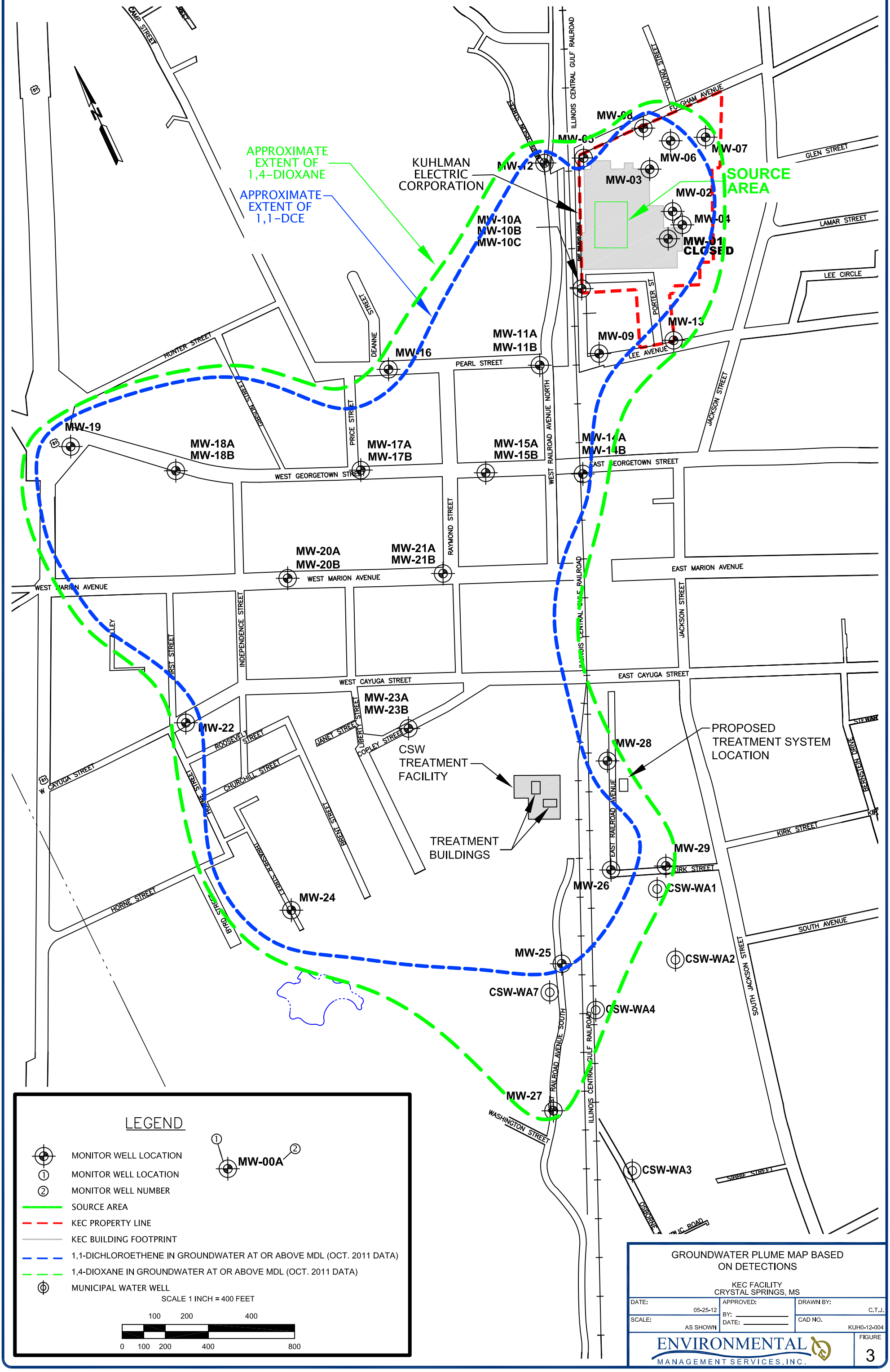
KEC FACILITY
CRYSTAL SPRINGS, MS

DATE: 05-25-12	APPROVED: BY: _____ DATE: _____	DRAWN BY: C.T.J.
SCALE: AS SHOWN		CAD NO. KUH0-12-004

ENVIRONMENTAL MANAGEMENT SERVICES, INC.

FIGURE 2

H:\0Projects\KUH0 - Kuhlman Electric\KUH0-12-004 Treatment Options for Contingency\Figures\FIG 2 - TRG PLUME 2011 RESULTS.dwg



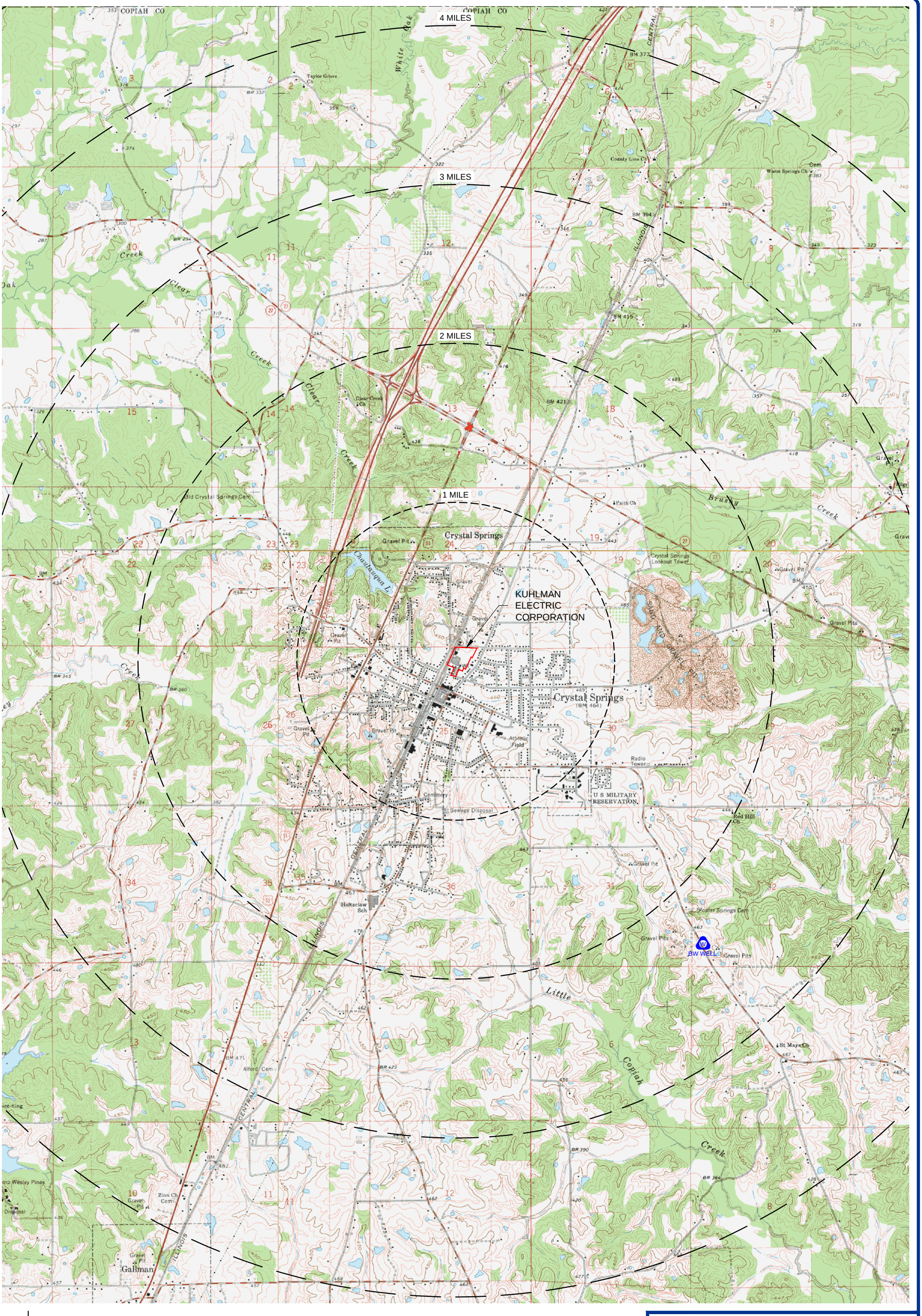
GROUNDWATER PLUME MAP BASED ON DETECTIONS

KEC FACILITY
CRYSTAL SPRINGS, MS

DATE: 05-25-12	APPROVED: BY: _____ DATE: _____	DRAWN BY: C.T.J.	
SCALE: AS SHOWN		CAD NO. KUH0-12-004	FIGURE 3

ENVIRONMENTAL MANAGEMENT SERVICES, INC.

H:\0Projects\KUH0 - Kuhlman Electric\KUH0-12-004 Treatment Options for Contingency\Figures\FIG 3 - EXTENT PLUME 2011 RESULTS.dwg



BW WELL BORG WARNER WATER WELL

SCALE 1 INCH = 3000 FEET

750 1500 3000

0 750 1500 3000 6000

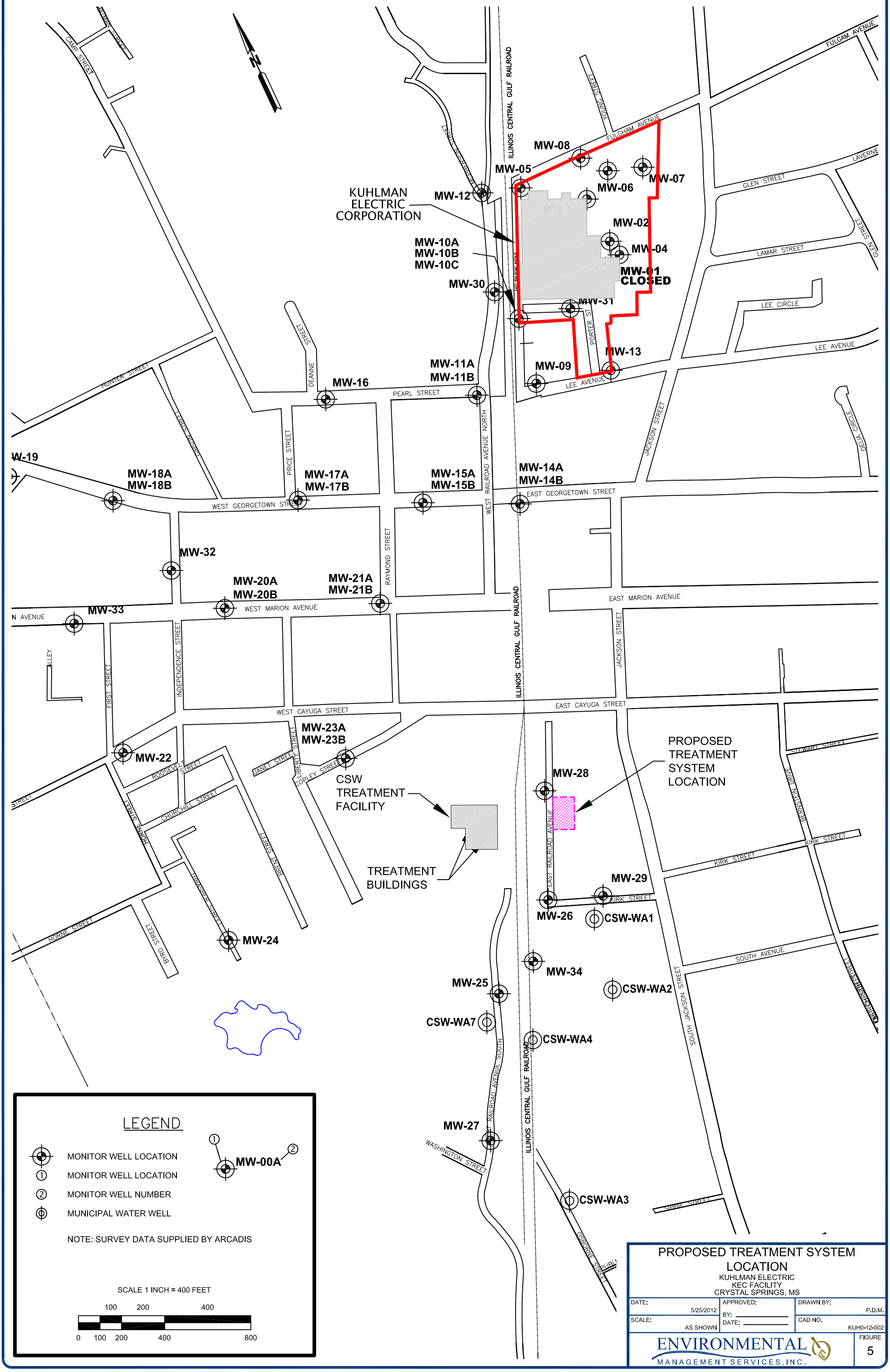
NEW WATER WELL LOCATION

KUHLMAN ELECTRIC
KEC FACILITY
CRYSTAL SPRINGS, MS

DATE: 5/25/2012	APPROVED: BY: DATE:	DRAWN BY: P.D.M.
SCALE: AS SHOWN		CAD NO. KUH0-12-002

ENVIRONMENTAL MANAGEMENT SERVICES, INC.

FIGURE 4



PROPOSED TREATMENT SYSTEM LOCATION

KUHLMAN ELECTRIC
KEC FACILITY
CRYSTAL SPRINGS, MS

DATE: 5/25/2012	APPROVED: BY: _____ DATE: _____	DRAWN BY: P.D.M.
SCALE: AS SHOWN		CAD NO. KUH0-12-002

ENVIRONMENTAL MANAGEMENT SERVICES, INC.

FIGURE 5

C:\Users\Paul\Documents\EMS Projects\KUH - Water Well Search\TREATMENT SYSTEM LOCATION.dwg

Figure 6 is a 24” x 36” map; the electronic version is too large to be transmitted by electronic communication. The hard copy version of this report includes the figure.

Appendix A

MDEQ Letter March 1, 2012

STATE OF MISSISSIPPI
PHIL BRYANT
GOVERNOR
MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
TRUDY D. FISHER, EXECUTIVE DIRECTOR

March 1, 2012

Mr. Phillip K. James
General Manager
ABB Kuhlman - SPT Division
101 Kuhlman Drive
Crystal Springs, MS 39059

Re: Groundwater Correction Action Plan
Kuhlman Electric Corporation Site
Crystal Springs, Mississippi

Dear Mr. James:

The Mississippi Department of Environmental Quality (MDEQ) has completed review of the revised Correction Action Plan (CAP) dated March 15, 2011, the Soil Vapor Extraction Pilot Test Plan (SVEPTP)dated January 10, 2012 and written comments provided by the public during the 30 day comment period. MDEQ review of the plans, the public comments and the uncontrolled sites file generated the following additional requirements:

1. That the possibility of having to curtail or shut down City Wells 1 and 2 in the future must be addressed in a timely manner. A proposed plan of action must be submitted by June 1, 2012. It is MDEQ understanding in correspondence with BorgWarner that a replacement well for City Well 7 will be drilled shortly.

2. That KEC shall employ such interim remedial actions as are necessary to protect human health, the environment and the City's water supply.

3. The groundwater monitor wells will continue to be monitored on a minimum of a semi-annual basis. The report of findings shall be submitted within 90 days of the last day in the field. All sample containers with appropriate preservative shall be provided for MDEQ split samples.

4. A mechanism for relaying information to the public in a timely manner shall be developed and submitted to MDEQ for approval by June 1, 2012.

5. The core of the groundwater plume down gradient of the KEC facility may need addressing if the removal of the source area beneath the plant does not reduce concentrations in a timely manner.

MDEQ hereby formally approves the CAP submitted by BorgWarner and the SVEPTP submitted by KEC for remediation of the groundwater at the site. The above requirements shall be incorporated into the CAP and implemented accordingly. Please call me with any questions you may have regarding the above requirements.

Sincerely,

Tony Russell, Chief
Assessment Remediation Branch

Appendix B

Borg Warner Letter to MDEQ October 2011

STEVEN J. LEVINE
Partner
(225) 376-0220
levines@phelps.com

October 11, 2011

20685-0021

VIA E-MAIL AND U.S. MAIL

Ms. Trudy D. Fisher
Executive Director
Mississippi Department of Environmental Quality
P. O. Box 2261
Jackson, MS 39225

Re: Crystal Springs, MS

Dear Ms. Fisher:

I write to provide MDEQ with information about BorgWarner Inc.'s ("BW") status with regard to Crystal Springs environmental activities.

As MDEQ is aware, remediation of the drainage channel is complete. Routine maintenance in and around the drainage channel is the ongoing responsibility of the City.

Following is the status of BW with respect to other Crystal Springs environmental activities:

1. BW will continue to monitor Crystal Springs' drinking water supply wells and supply lines on a monthly basis and will continue to provide the resulting data to MDEQ;

2. BW will continue to pay for the replacement of City Well No. 7 with a new supply well;

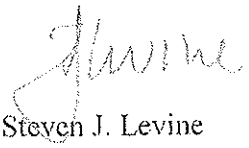
3. MDEQ has received EPA's draft comments on the Lake Chautauqua Ecological Risk Assessment. EPA concurred with the conclusions reached by Arcadis in the September 2010 Lake Chautauqua Ecological Risk Assessment. BW suggests that MDEQ may wish to ask EPA to finalize the draft Risk Assessment comments.

Items (1) and (2) above are voluntary actions by BW taken in the spirit of cooperation with MDEQ and the City.

Please contact me with any questions or comments

Very truly yours,

PHELPS DUNBAR LLP



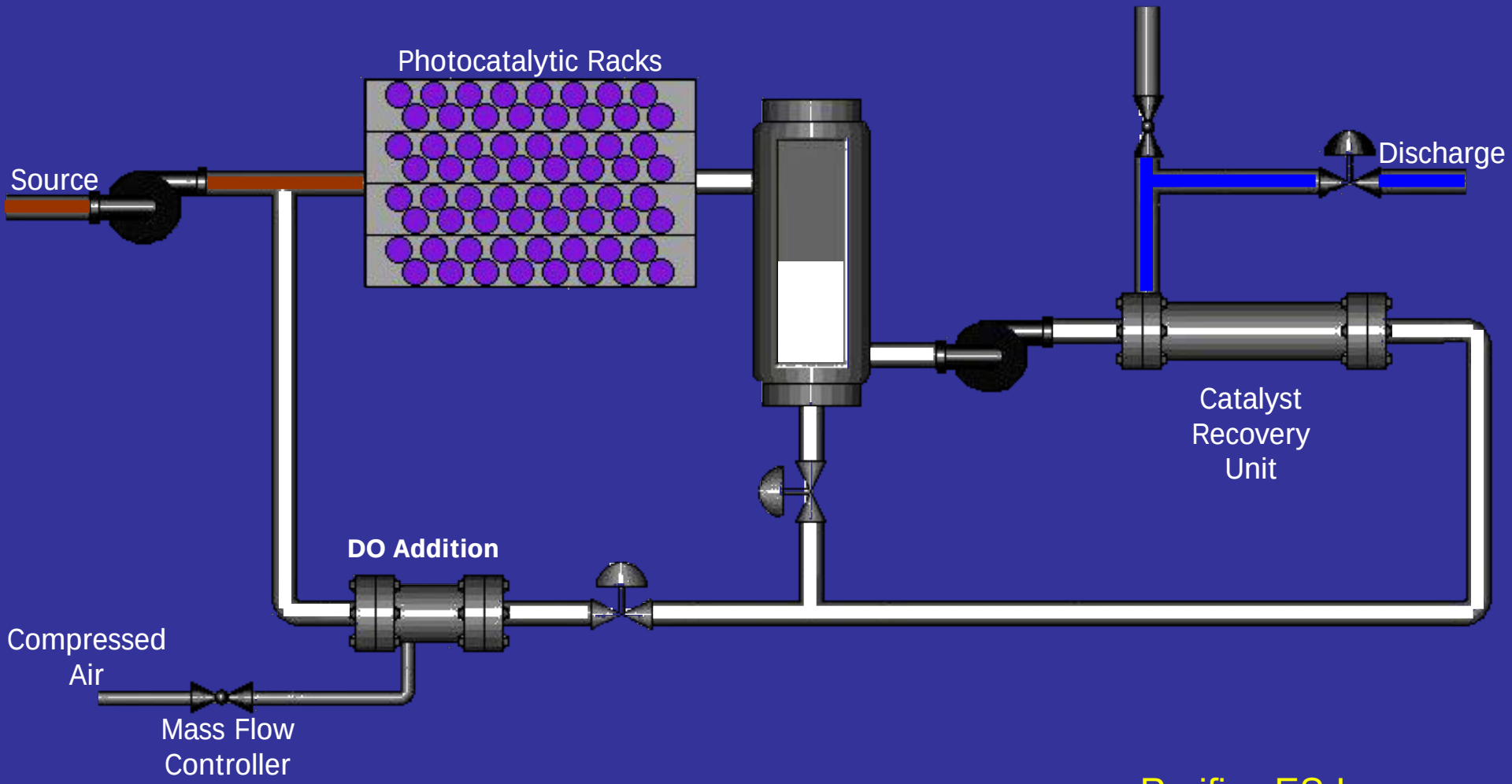
Steven J. Levine

cc: Anastasia Hamel
Peter Holmes
Jim Shelson

Appendix C

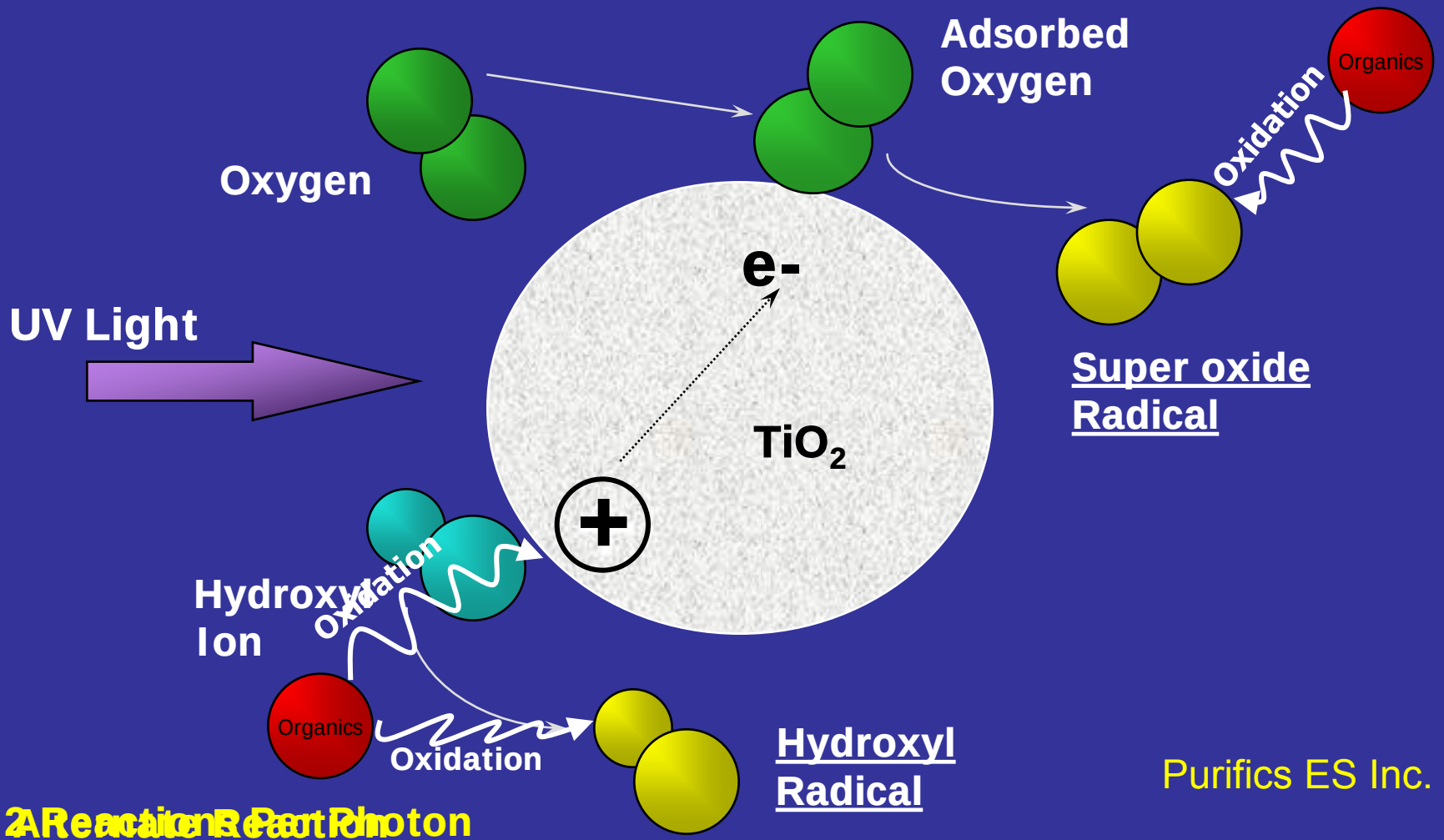
Photo-Cat AOP+®

How Photo-Cat Works



Purifics ES Inc.

Photo-Cat Chemistry



Purifics ES Inc.

Appendix D

MDOH Requirements for Operators

Title 15 - Mississippi Department of Health

Part III – Office of Health Protection

Subpart 72 – Bureau of Public Water Supply

CHAPTER 02 REGULATION GOVERNING THE CERTIFICATION OF MUNICIPAL AND DOMESTIC WATER SYSTEM OPERATORS

100 GENERAL PROVISIONS

100.01 **Legal Authority.** This regulation has been promulgated under the authority of and pursuant to the Municipal and Domestic Water and Wastewater System Operator's Certification Act of 1986**,** Sections 21-27-201 through 21-27-221**,** Mississippi Code of 1972. Annotated**.**

100.02 **Definitions.**

1. **Association** shall mean the Mississippi Water and Pollution Control Operators Association, Inc.

2. **Available** shall mean a certified operator employed by the water system holding an operator's certificate equivalent or higher than the class of the public water system, whose principle residence is no more than fifty (50) miles from the water system. The water system must be able to contact this certified operator at all times by telephone, pager or other reliable mode of communication acceptable to the Mississippi Department of Health to address system needs and problems as they occur.

3. **Board** shall mean the Mississippi State Board of Health.

4. **Bureau** shall mean the Bureau of Public Water Supply of the Mississippi Department of Health.

5. **Community Water System** shall mean any water system serving piped water for human consumption to fifteen (15) or more individual service connections used year-round by consumers or regularly serving twenty-five (25) or more individual consumers year-round, including, but not limited to, any collection, pretreatment, treatment, storage and/or distribution facilities or equipment used primarily as part of, or in connection with such system, regardless of whether or not such components are under the ownership or control of the operator of such system.

6. **Department** shall mean the Mississippi Department of Health.

7. **Director** shall mean the director of the Mississippi Department of Health or his designated representative.

8. **Distribution System** shall mean all water mains, repumping facilities, and appurtenances past treatment.

9. **Non-transient non-community water system** shall mean a public water system that is not a community water system and that regularly serves at least 25 of the same persons.

10. **Operator** shall mean the certified waterworks operator who directly supervises and is personally responsible for the daily operation and maintenance of a community or non-transient non-community public water system.

11. **Part-time operator** shall mean any certified waterworks operator who is employed as the certified waterworks operator for a public water system and is not considered a full-time employee of the public water system. This definition shall include certified waterworks operators who are serving as the certified waterworks operator for public water systems through privately owned operating companies.

12. **Person** shall mean the state or other agency or institution thereof, any municipality, political subdivision, public or private corporation, individual, partnership, association or other entity, and includes any officer or governing or managing body of any municipality, political subdivision, or public or private corporation, or the United States or any officer or employee thereof.

13. **Responsible Charge** shall mean a certified operator, holding a Department waterworks operator's license at a class equivalent to or higher than the class of the water system, who is officially designated by the owner or responsible official of the water system as the operator responsible for making all decisions regarding the daily operational activities of the public water system including all components of the water system such as treatment plants, water wells, distribution systems, etc. Under special circumstances, the Department may authorize a water system to have more than one operator in responsible charge.

100.03 **Certificates.**

Effective July 1, 1987, all municipal and domestic community water systems must be operated by persons who are certified by the Mississippi Department of Health as qualified to operate such facilities. Effective July 1, 1998, all non-transient non-community public water systems must be operated by persons who are certified by the Department to operate such facilities.

1. Certificates of competency will be issued by the Bureau only after the applicant has passed the appropriate examination and has met the minimum requirements as specified in Section 102.01.

2. Certificates issued in accordance with section 21-27-213 (Grandfather Clause) of the Municipal and Domestic Water and Wastewater System Operator's Certification Act of 1986, shall be valid only for the particular public water system operated by the applicant at the time the certificate was issued, and then only so long as the system remains in the same or lower classification as at the time the application was filed.

3. Certificates shall be valid for three (3) years from the date of issuance, unless suspended or revoked for cause.

4. In the event of temporary loss of an operator, notice shall be immediately given to the Bureau and the continued operation of such system, without a certified operator, may proceed on an interim basis for a period not to exceed one hundred eighty (180) days, except for good cause shown upon petition to the Bureau.

5. Certificates may be issued, without examination, in a comparable classification to an operator who holds a certificate in any state, territory, or possession of the United States or any country that has entered into a reciprocity agreement with the Bureau.

6. Any person allowed to actually make physical changes on a public water system that impact water quality or quantity must hold a waterworks operator's license issued by the Bureau at a class equivalent to or higher than the class of the public water system.

101 CLASSIFICATION OF PUBLIC WATER SYSTEMS & OPERATOR IN RESPONSIBLE CHARGE

101.01 **Classes of Water Systems.**

Water systems shall be classified in accordance with criteria outlined below. Special systems which do not fall within these guidelines shall be considered as individual cases and be classified by the Bureau. All public water systems shall be under the direct supervision of a Department licensed waterworks operator who is designated by the owner or responsible official of the system as the operator in responsible charge of the water system. In those situations where a public water system contracts with a private operating company to operate the public water system, the responsible official of the public water system may authorize the private company to designate an operator employed by the company as the operator in responsible charge of the water system. In either case, the water system shall identify, by means of the Public Water System Annual Report submitted each year to the Department, the certified operator in responsible charge of the public water system.

1. **Class E.** Water systems that purchase water only and do not provide additional treatment. This classification shall also apply to waterworks operators whose only job responsibility is the operation and maintenance of distribution system(s). The certified operator in responsible charge shall be available 24 hours a day to address system needs and problems as they occur.

2. **Class D**. Water systems with no treatment other than chlorination and/or fluoridation or direct chemical feed such as polyphosphate. The certified operator in responsible charge shall be available 24 hours per day to address system needs and problems as they occur.

3. **Class C**. Water systems with aeration, pH adjustment, corrosion control or closed pressure filtration treatment facilities including zeolite softening or iron removal. The certified operator in responsible charge shall be available 24 hours per day to address system needs and problems as they occur.

4. **Class B**. Water systems with two (2) or more Class C treatment facilities of different types, or with iron or manganese removal facilities breaking pressure or requiring flocculation and/or sedimentation. The certified operator in responsible charge shall be available 24 hours per day to address system needs and problems as they occur.

5. **Class A**. Systems with surface water treatment, lime softening, or coagulation and filtration for the removal of constituents other than iron or manganese. A licensed class A operator shall be onsite whenever the treatment plant for a Class A public water system treating surface water is in operation. The certified operator in responsible charge shall be available 24 hours per day to address system needs and problems as they occur.

102 OPERATOR QUALIFICATIONS

102.01 Qualifications for Each Class Operator

1. **Class A.**

   a. The applicant must have at least a bachelor's degree in engineering or applied sciences from an accredited college or university, at least one year~~s~~ of experience in a Class A water plant, and pass the written examination required by the Bureau, or

   b. The applicant must be a graduate of an accredited high school or possess an equivalent (GED), have at least six (6) years experience in a Class A or B water plant, of which at least one year must be in a Class A plant, and pass the written examination required by the Bureau.

2. **Class B.** The applicant must have graduated from an accredited high school or possess an equivalent (GED), have at least three (3) years of experience in a Class A, B, or C water plant, of which one year must be in a Class A or B plant, and pass the written examination required by the Bureau.

3. **Class C.** The applicant must have graduated from an accredited high school or possess an equivalent (GED), have at least two (2) years of experience in a Class A, B, C, or D water plant of which one year must be in a Class A, B, or C water plant, and pass the written examination required by the Bureau.

4. **Class D.** The applicant must have graduated from an accredited high school or possess an equivalent (GED), and the applicant must have at least one year of experience in the same class facility as being applied for or a higher level. In addition, the applicant must pass the written examination required by the Bureau.

5. **Class E.** The applicant must have graduated from an accredited high school, or possess an equivalent (GED) and the applicant must have at least one year of experience in the same class facility as being applied for or a higher level. In addition, the applicant must pass the written examination required by the Bureau.

102.02 **General Qualifications for all Certified Waterworks Operators**

1. One year of the required experience must be earned under the direct supervision of a certified waterworks operator who holds a valid non-restricted certificate issued by the Department at a class equivalent to or higher than that for which certification is being requested. The year of supervision must be obtained in a public water system of a class equivalent to or higher than the class certificate being requested. The supervising operator must sign a certification statement verifying the successful completion of the required period of supervision. In addition, two Department certified waterworks operators, other than the operator who provided this supervision, must sign a certification statement recommending the applicant for certification. Under special circumstances, the Department may waive the requirements of this section based upon written evidence of good cause.

2. To be eligible to serve as the certified operator for a community or non-transient non-community public water system, an operator's principal residence must be no more than fifty (50) miles from the system. Under special circumstances, an operator may apply to the Bureau in writing for a waiver of the 50 mile requirement.

3. An individual whose operator's license has been expired for 24 months or less shall be eligible to receive a new waterworks operator's license at a level no higher than the license previously issued by the Bureau if he/she successfully passes the written examination required by the Bureau. To be eligible to retake the examination, the operator must comply with the provisions of section 104.01(5) of this regulation. The provisions of section 102.02(1) of this regulation shall be waived for applications received under this section. Operators whose license has been expired more than 24 months must successfully pass the written examination required by the Bureau and comply fully with the provisions of section 102.02(1).

4. Operators who have received special vocational training, such as special schools, short courses, correspondence courses, etc., may be given credit for some portion of the deficiency in their experience. Special vocational training programs shall be approved in writing and in advance of the training. Approval shall be at the discretion of the Bureau. After a specific program of special vocational training has been approved, the Bureau shall award credit for experience using the following criteria:

   a. Eight (8) weeks of classroom instruction will be equivalent to one year experience.

   b. One week of on-the-job training will be equivalent to one week experience.

   c. Special vocational training programs that have combinations of classroom instruction and on-the-job training will be evaluated by first separating classroom instruction from on-the-job training. Credit will be for experience on the basis of the two previous criteria. The total credit awarded for the program will be the sum of the two parts.

   d. Each year of college successfully completed in engineering, biological sciences, mathematics, chemistry, or physics will be considered the equivalent of two (2) years experience.

   e. At least one year of water system experience is required in all classes. This one year of experience cannot be substituted by special vocational training programs or college education.

103 APPLICATION AND FEES

103.01 Filing Application

1. Applicants for licensure as a certified waterworks operator shall file an application with the Bureau on a form provided by the Bureau.

2. The Bureau will review the application and supporting documents, determine the eligibility of the applicant, and issue a certificate when the applicant meets the minimum requirements of the class requested.

103.02 **Fees**

1. A fee of fifty dollars ($50.00) shall be charged for initial certification or reactivation of an expired certificate in any classification and must be paid to the Bureau prior to actual issuance of the certificate.

2. A fee of thirty dollars ($30.00) shall be charged for the renewal of an active certificate and must be paid to the Bureau prior to actual issuance of the renewal certificate.

3. All application fees must be received within *fifteen (15)* days of being invoiced by the Department. Application fees received after *fifteen (15)* days will be returned to the applicant and the applicant must reapply to the Department for certification or renewal.

104 EXAMINATIONS

104.01 **Written Examinations**

1. The Bureau shall prepare written examinations to be used in determining knowledge, ability, and judgment of operators.

2. Examinations shall be held at places and times set by the Bureau.

3. An individual who passes an examination must be certified within three (3) years following the date the examination was taken. Otherwise, the individual will be required to pass another written examination in order to be certified.

4. Examination papers will not be returned to the individuals.

5. To be eligible to take a written examination, an individual must satisfactorily demonstrate to the Bureau that he/she has attended a Bureau sponsored waterworks operators' short course within the previous 12 months.

105 RENEWAL OF WATERWORKS OPERATOR CERTIFICATES

105.01 **Requirements and Limitations**

1. Certificates may be renewed without examination. An application for renewal of a waterworks operator's certificate of competency must be physically received by the Bureau within thirty (30) days following the date the certificate expires. This application must be accompanied by

proof of completion of the continuing education requirements found in section 105.01(2). Upon approval of the renewal application, the applicant will be invoiced for the renewal fee of $30.00. The Bureau must receive this renewal fee prior to issuing the new waterworks operator's certificate of competency. Certified operators who file renewal applications more than thirty (30) days after expiration of their certificate will be denied renewal of their certificate and must pass the appropriate written examination and apply for a new certificate.

2. Operators who have been continuously licensed by the Bureau less than nine (9) years must complete at least forty-eight (48) hours of related continuing education (CEUs) per three (3) year certificate renewal period with at least 12 hours of these CEUs in Bureau approved "Regulation and Compliance" training programs. Operators who have been continuously licensed by the Bureau for nine (9) years or more are required to obtain 24 hours of CEUs in the three year certificate renewal period with at least twelve (12) hours of these CEUs in Bureau approved "Regulation and Compliance" training programs. All continuing education requirements must be met prior to the expiration date of the certificate. These CEUs must be appropriate for the classification held by the operator and may only be obtained by attending training sessions approved by the Bureau. All training, correspondence courses, etc., shall be approved in writing and in advance of the training. Approval shall be strictly at the discretion of the Bureau. Training will be evaluated by the Bureau on an hour for hour basis for continuing education credit.

   Mississippi Department of Environmental Quality approved wastewater training programs will be awarded CEU credit by the Bureau at the rate of (1) water CEU hour for every 2 wastewater CEU hours earned.

   Each certified operator is responsible for maintaining all necessary records to document the completion of the required hours of continuing education. Original documentation of the completion of the required continuing education must be submitted with the application for renewal of the operator's certificate of competency. Copies of CEU certificates are not acceptable. Any waterworks operator who is issued a restricted (grandfather) license by the Department after May 2000, in order to qualify for renewal of this license, shall attend a Department sponsored short course during the 3 year restricted (grandfather) license period. This short course must be at the level of classification of the water system or higher.

106 CERTIFIED WATERWORKS OPERATOR JOB PERFORMANCE, RECORD KEEPING AND REPORTING REQUIREMENTS

106.01 **Annual Reporting Requirements**

1. Each certified waterworks operator and responsible official shall sign the certification statement on the Public Water System Annual Report for each public water system for which he/she is the designated certified waterworks operator in responsible charge of the public water system as required by Mississippi State Law. If a public water system fails to provide a completed Public Water System Annual Report to the Bureau within 45 days of this Report being mailed to the water system by the Bureau, the Department shall officially declare the public water system to be without a certified waterworks operator and the water system shall be in violation of this regulation and Mississippi State law.

2. Each certified waterworks operator, or his/her representative(s), shall maintain an approved Public Water System Operations Log Book documenting all activities completed on the public water system where he serves as the official certified waterworks operator. This log book must be available for inspection by Bureau staff. The Public Water System Operations Log Book is the property of the public water system and must remain as part of the official records of the Public Water System.

106.02 **Job Performance**

Each certified waterworks operator shall abide by the current edition of the Minimum Job Performance Guidelines booklet published by the Bureau of Public Water Supply. This booklet presents the minimum duties and responsibilities for Department certified waterworks operators in the State of Mississippi.

106.03 **Presence of Certified Waterworks Operator during Sanitary Surveys and Inspections**

The certified waterworks operator for a public water system shall be present for the conduct of sanitary surveys and inspections by Bureau staff when requested by Bureau staff and when provided at least 24 hours notice of the survey or inspection. Under special circumstances, this requirement may be waived provided the certified operator arranges for someone to represent him/her during the survey or inspection.

107 WATERWORKS OPERATOR LICENSURE WAIVERS

107.01 **Waivers.**

The Director may waive any part or parts of this regulation if the Director determines that such waiver will not potentially jeopardize public health.

108 SUSPENSION AND REVOCATION OF CERTIFICATES

108.01 **Criteria for Suspension or Revocation of a Waterworks Operator's Certificate**

1. A waterworks operator's certificate of competency may be revoked or suspended by the Department for just cause. Causes include, but are not limited to, the following:

    a. Fraud or deception;

    b. Misfeasance, malfeasance or nonfeasance;

    c. Violation of any provision of the "Mississippi Municipal and Domestic Water and Wastewater System Operators' Certification Law of 1986," or any rule or regulation of the Department promulgated there under;

    d. Violation of any provision of the Federal Safe Drinking Water Act or the Mississippi Safe Drinking Water Act; or any rule or regulation, federal or state, promulgated under these laws;

    e. Failure to file any official reports required by the Department;

    f. Failure to maintain all official records required by the Department;

    g. Failure to respond to any official correspondence from the Department;

    h. Failure to obey a lawful order of the Director or any duly appointed Administrative Hearing Officer of the Department;

    i. Failure to exercise reasonable care or judgment in the operation of a public water supply or in the performance of official duties;

    j. Failure to comply with the terms of a suspension of certificate issued by the Department;

108.02 No certificate of competency will be suspended or revoked without notice to the waterworks operator and an opportunity for a hearing. Hearings shall be held in conformity with Sections 21-27-219 and 21-27-221 Mississippi Code of 1972 Annotated.

108.03 Notwithstanding the requirement for a hearing, the Department may, if it determines that public health is threatened, issue any such orders as are deemed necessary to protect the public health, including, but not limited to, orders to individual(s) to cease all actions as a certified waterworks operator in the State of Mississippi.

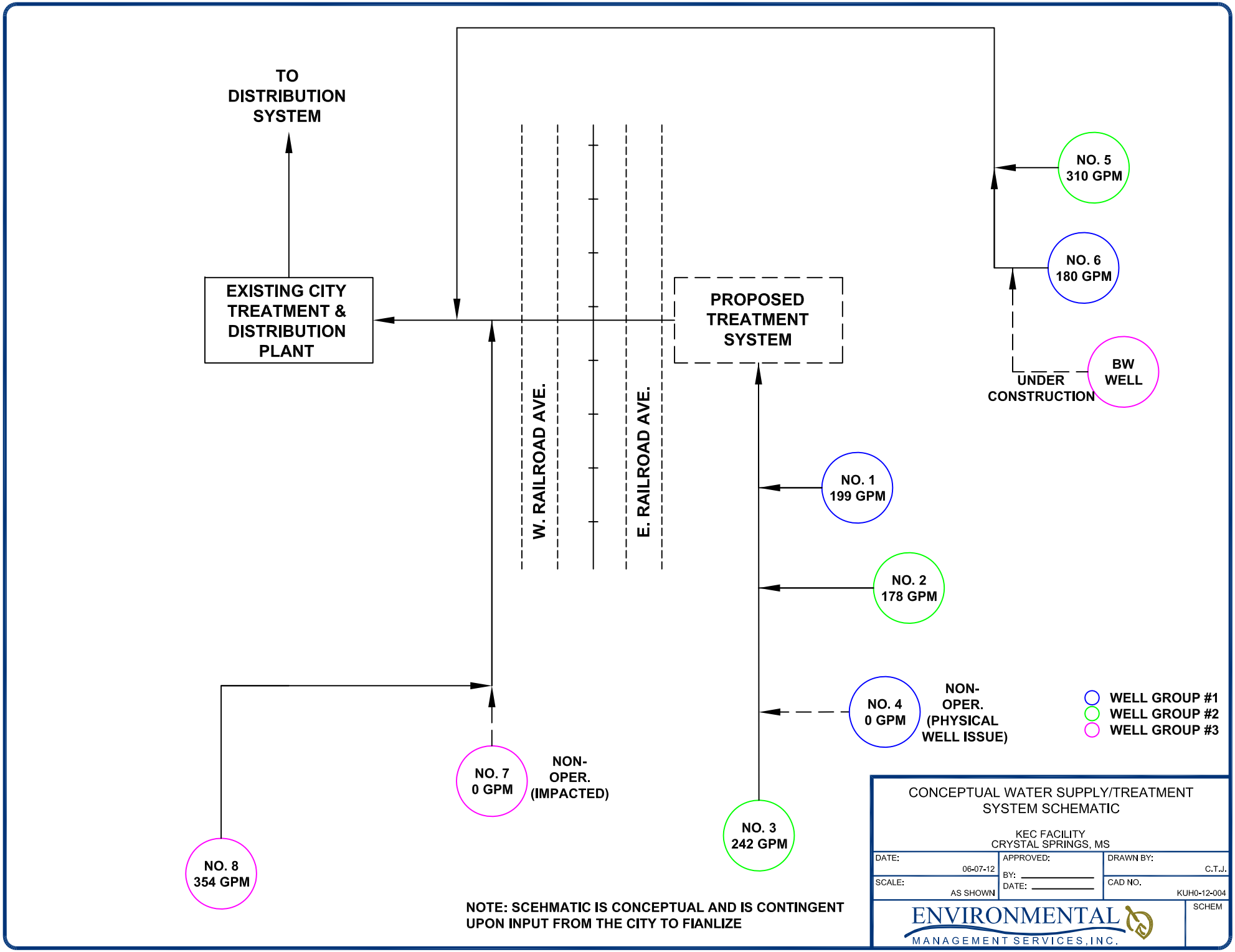
109 ENFORCEMENT AND APPEALS

109.01 **Procedures**

Enforcement and appeals shall be in accordance with the Municipal and Domestic Water and Wastewater System Operator's Certification Act of 1986.

Appendix E

Schematic of City Piping


TO DISTRIBUTION SYSTEM
EXISTING CITY TREATMENT & DISTRIBUTION PLANT
PROPOSED TREATMENT SYSTEM
W. RAILROAD AVE.
E. RAILROAD AVE.
NO. 5 310 GPM
NO. 6 180 GPM
UNDER CONSTRUCTION
BW WELL
NO. 1 199 GPM
NO. 2 178 GPM
NO. 4 0 GPM
NON-OPER. (PHYSICAL WELL ISSUE)
NO. 7 0 GPM
NON-OPER. (IMPACTED)
NO. 3 242 GPM
NO. 8 354 GPM
WELL GROUP #1
WELL GROUP #2
WELL GROUP #3
NOTE: SCEHMATIC IS CONCEPTUAL AND IS CONTINGENT UPON INPUT FROM THE CITY TO FIANLIZE
CONCEPTUAL WATER SUPPLY/TREATMENT SYSTEM SCHEMATIC
KEC FACILITY
CRYSTAL SPRINGS, MS
DATE: 06-07-12
APPROVED: BY: DATE:
DRAWN BY: C.T.J.
SCALE: AS SHOWN
CAD NO. KUH0-12-004
ENVIRONMENTAL MANAGEMENT SERVICES, INC.
SCHEM

Appendix F

Implementation Strategy for Interim Treatment

Implementation Strategy for Interim Treatment

Capacity Determination

The capacity of the proposed treatment unit will be based upon the historical production from CSW-WA1 and CSW-WA2. Due to the piping configuration indicated by the City of the existing supply system, these two wells are connected to a common header with CSW-WA3 and CSW-WA4. It is understood that CSW-WA4 is out of service. It is understood that CSW-WA1, CSW-WA2, and CSW-WA3 are cycled intermittently dependent upon need and their ability to sustain production, which is limited by proximity and aquifer characteristics.

The nature of the treatment unit proposed allows for variation in flow rates and can easily be up scaled or downscaled; therefore, it will be able to adjust according to the actual requirements incurred by the anticipated well production as needed.

Constraints

- Existing piping configurations
- Lack of existing alternative water sources of quality and quantity required within practical reach of existing systems
- Characteristics of contaminants/difficulty of treatment
- Effective treatment equipment availability
- MDOH requirements
- Public perception of treated water
- Time sensitivity

Proposed Plan Elements

- City, MDOH, MDEQ, KEC plan approval
- Permitting, MDOH
    - Class A operation designation as long as system is in operation
    - City system reverts to Class C after treatment is no longer needed due to new well production being placed online
- Treatment technology
    - Ultraviolet advanced oxidation process
    - Photo-Cat AOP+® package treatment unit
    - Unit schematic and description attached
    - Equipment purchase by KEC – 4 to 5 month delivery time
    - KEC maintains equipment ownership post use
- Treatment Unit Location
    - City owned property address on East Railroad Avenue

    - Location map
- System Integration
    - Infeed stream- existing underground trunk line CSW-WA1, CSW-WA2, CSW-WA3, & CSW-WA4
    - Reinjection post treatment to consolidation unit
    - System performance monitoring
    - Class A Operator required
    - Flow diagram (to be provided by City Engineers)
- Quality Control
    - Unit discharge analytical monitoring schedule
    - City reporting
    - MDOH reporting
    - MDEQ reporting
- Operation, Maintenance, Monitoring, and Reporting
    - KEC/KEC contractor performance
    - Class A operator when unit operates
    - City Engineers monitoring
    - Monthly performance analytical reporting
- Design and Installation
    - KEC performs
    - City Engineers design review
- Schedule
    - Engineering and design of system tie-in to existing City underground piping
    - City Engineers review
    - Bidding and contracts – KEC
    - Surface construction and piping installation
    - Electrical supply
    - Equipment delivery and installation
    - Startup training and testing
    - System online
    - System operation and monitoring
- System dismantling and removal
    - KEC
    - Long-term wells online and functioning
    - Agreement on treatment unit shutdown, City, MDOH, MDEQ, and KEC

Appendix G

Implementation Strategy for Volume Replacement

Implementation Strategy for Volume Replacement

Volume Determination

- One new well (BW Well) is currently under construction whose production volume is unknown and will not be known until it is brought online. The contribution of this well to the overall solution with respect to volume produced will have to be determined and accounted for prior to siting and installing any additional wells that might be necessary.
- The historical production records generated by the City for the two wells noted will be used as a basis for the determination of the desired volume to be replaced by new wells.
- The historical production records generated by the City for the entire system will be used as a benchmark target for the entire resultant system.
- Based upon these records the City Engineer will make recommendations to the City in reference to the design parameters for the volume/capacity replacement.
- KEC consultants will review the basis and conclusions of the City Engineer with respect to the recommended parameters and be given the opportunity for comment.
- An additional well or wells will be installed as necessary to compensate for the replacement volume/capacity agreed upon.

Replacement Well/Wells Location

- Most potable water is being produced from the Citronelle aquifer within the general area of the City and Copiah County. Other deeper fresh water producing zones have proven to produce water of less quality requiring further treatment before use. Numerous public, institutional, commercial, and residential wells operate and draw water from the Citronelle aquifer. Hence, the well/wells will likely need to be screened in this groundwater zone.
- Recharge of this aquifer is via rainfall and the general flow direction of groundwater in this vicinity is to the Southwest.
- The City currently has two operating wells east of the City along with existing underground piping back to the central consolidation location. This up gradient general area to the east of the City would logically be the most desirable vicinity for the location of additional wells to replace the volume typically produced by the two wells in question; however, the location search will not be limited to this area alone.
- A conceptual model will be developed including the entire well field, known contaminant plume, and production rates to be used in the selection process to

evaluate potential effects of upgradient pumping on existing wells and the contaminant plume.

- Piping back to the City consolidation unit already exists linking the two existing wells. The possibility exists that additional wells may also be linked to existing piping or via new piping along the City's existing easement.

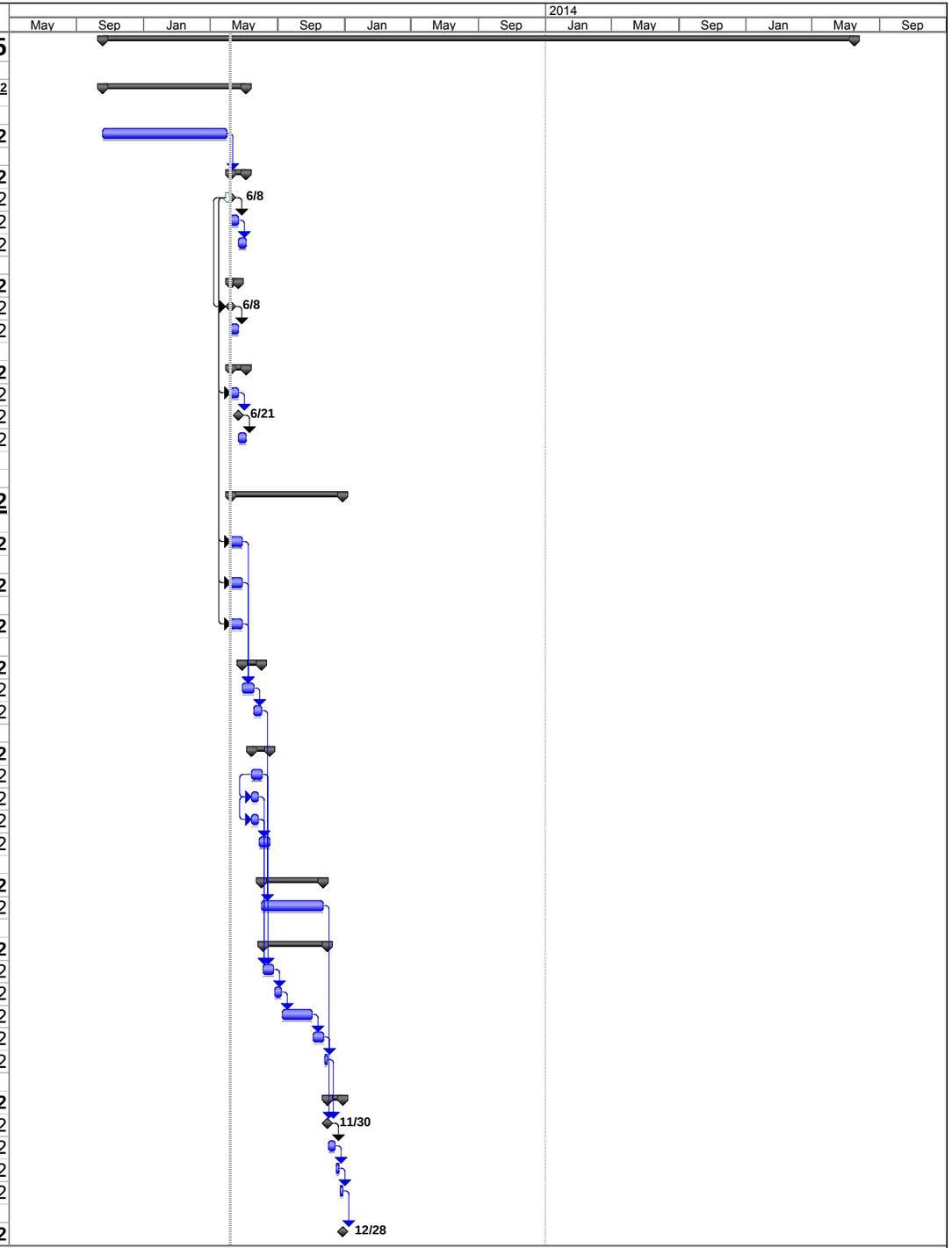
Process (General)

- Consensus between all parties with respect to replacement volume/capacity
- Consensus between all parties with respect to general area location for new well siting
- Acquisition of engineering specifications for existing facilities/wells and transmission piping within the "eastern" City well field – City Engineers
- Well location search, easements, permissions for test locations – KEC/City Engineers
- Design and permitting – KEC/City Engineers/MDOH
- Contractor selection/bidding – KEC/City Engineers
- Site selection and test well installation followed by actual well installation – KEC/Contractor/City Engineer
- Piping design and installation – KEC/City Engineers
- Volume/capacity re-evaluation including the well volumes of the well currently under construction and the new well proposed – City Engineers/KEC
- Decision with respect to the satisfaction of the overall project objective – KEC/City/MDOH/MDEQ
- Estimated time well(s) operational and online – 2-3 years

Appendix H

Gantt Charts

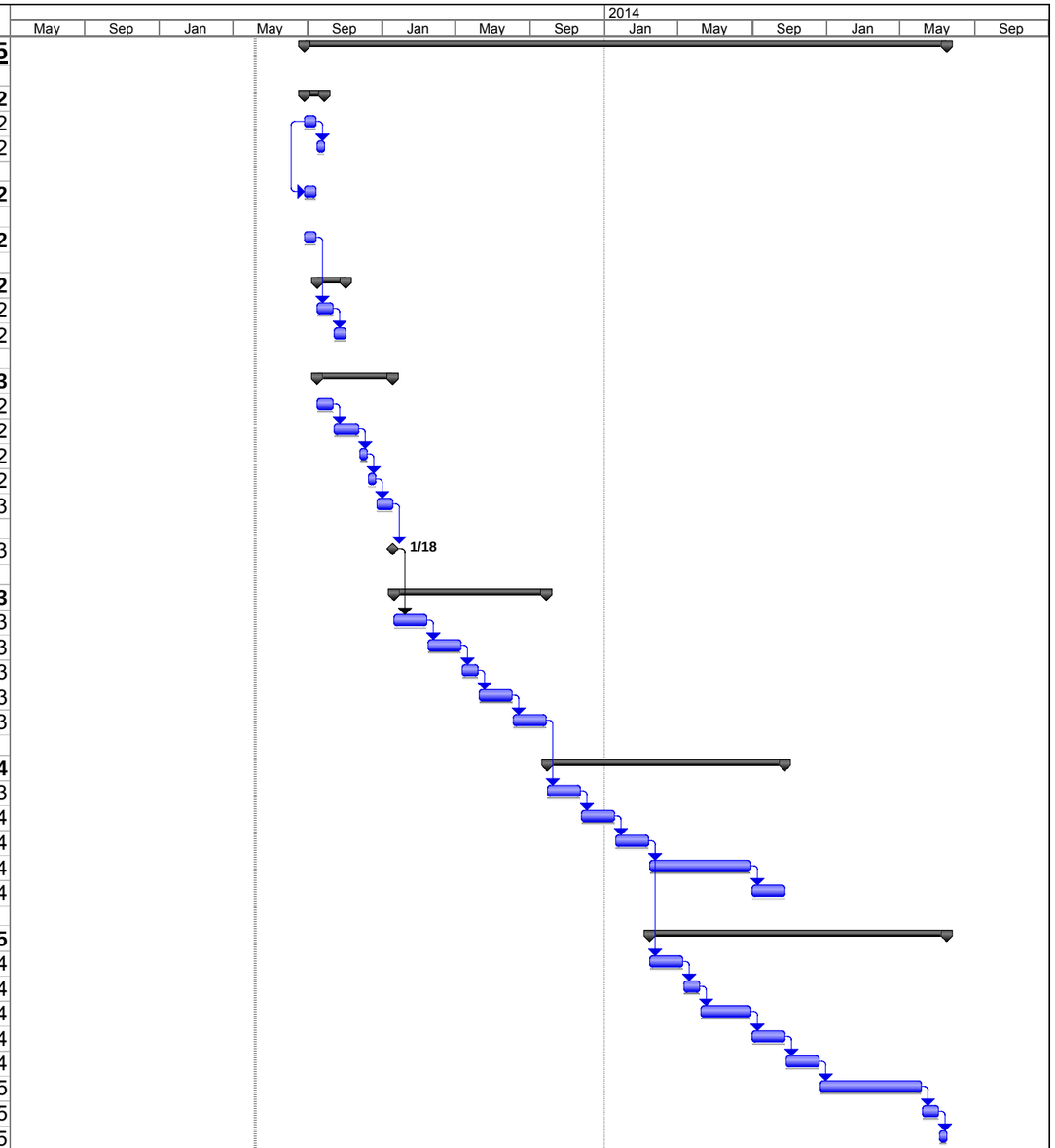
ID	Task Name	Duration	Start	Finish
1	**KEC CAPACITY PLAN SCHEDULE**	**978 days**	**Wed 10/19/11**	**Fri 7/17/15**
2				
3	**Overall Plan Concept**	**187 days**	**Wed 10/19/11**	**Thu 7/5/12**
4				
5	**Plan Preparation / Technology Evaluations**	**162 days**	**Wed 10/19/11**	**Thu 5/31/12**
6				
7	**MDEQ Plan Approval**	**20 days**	**Fri 6/8/12**	**Thu 7/5/12**
8	Plan Submittal to MDEQ	0 days	Fri 6/8/12	Fri 6/8/12
9	MDEQ Review and Comment	2 wks	Fri 6/8/12	Thu 6/21/12
10	MDEQ Approval	2 wks	Fri 6/22/12	Thu 7/5/12
11				
12	**MDOH Plan Approval**	**10 days**	**Fri 6/8/12**	**Thu 6/21/12**
13	Plan submittal to MDOH	0 days	Fri 6/8/12	Fri 6/8/12
14	MDOH Approval	2 wks	Fri 6/8/12	Thu 6/21/12
15				
16	**City Board of Aldermen Plan Approval**	**20 days**	**Fri 6/8/12**	**Thu 7/5/12**
17	City Review and Comment	2 wks	Fri 6/8/12	Thu 6/21/12
18	Plan Submittal to City Board of Aldermen	0 days	Thu 6/21/12	Thu 6/21/12
19	City Approval	2 wks	Fri 6/22/12	Thu 7/5/12
20				
21				
22	**Interim Treatment System**	**146 days**	**Fri 6/8/12**	**Fri 12/28/12**
23				
24	**Bench Pilot Study**	**3 wks**	**Fri 6/8/12**	**Thu 6/28/12**
25				
26	**Historical Production Records Provided by CE**	**3 wks**	**Fri 6/8/12**	**Thu 6/28/12**
27				
28	**Existing Subsurface Piping Configuration Provided by CE**	**3 wks**	**Fri 6/8/12**	**Thu 6/28/12**
29				
30	**Design Parameters**	**25 days**	**Fri 6/29/12**	**Thu 8/2/12**
31	Establish Design Volume Criteria	3 wks	Fri 6/29/12	Thu 7/19/12
32	City Engineer Design Review and Approval	2 wks	Fri 7/20/12	Thu 8/2/12
33				
34	**System Installation Engineering & Design**	**25 days**	**Mon 7/16/12**	**Fri 8/17/12**
35	Subsurface Piping Modifications Design	3 wks	Mon 7/16/12	Fri 8/3/12
36	Enclosure Design	2 wks	Mon 7/16/12	Fri 7/27/12
37	Electrical Design	2 wks	Mon 7/16/12	Fri 7/27/12
38	Permits	3 wks	Mon 7/30/12	Fri 8/17/12
39				
40	**Treatment Equipment Procurement**	**80 days**	**Fri 8/3/12**	**Thu 11/22/12**
41	Photo-Cat Order	4 mons	Fri 8/3/12	Thu 11/22/12
42				
43	**Pre-Installation Construction**	**85 days**	**Mon 8/6/12**	**Fri 11/30/12**
44	Construction Specifications Preparation	3 wks	Mon 8/6/12	Fri 8/24/12
45	Bidding & Award	2 wks	Mon 8/27/12	Fri 9/7/12
46	Piping Subsurface and Surface Construction	2 mons	Mon 9/10/12	Fri 11/2/12
47	Structure Construction	3 wks	Mon 11/5/12	Fri 11/23/12
48	Electrical	1 wk	Mon 11/26/12	Fri 11/30/12
49				
50	**Installation**	**20 days**	**Fri 11/30/12**	**Fri 12/28/12**
51	Equipment Delivery	0 days	Fri 11/30/12	Fri 11/30/12
52	Equipment Connections	2 wks	Mon 12/3/12	Fri 12/14/12
53	Pilot Testing	1 wk	Mon 12/17/12	Fri 12/21/12
54	Training	1 wk	Mon 12/24/12	Fri 12/28/12
55				
56	**Target Operation**	**0 days**	**Fri 12/28/12**	**Fri 12/28/12**



Project: KEC Contingency Plan Sched
Date: Wed 6/6/12

Task | Progress | Summary | External Tasks | Deadline
Split | Milestone | Project Summary | External Milestone

ID	Task Name	Duration	Start	Finish
57	**Volume Replacement**	**755 days**	**Mon 8/27/12**	**Fri 7/17/15**
58				
59	**New BW Well Evaluation**	**25 days**	**Mon 8/27/12**	**Fri 9/28/12**
60	Production Volume Verification	3 wks	Mon 8/27/12	Fri 9/14/12
61	City Engineer Review and Approval	2 wks	Mon 9/17/12	Fri 9/28/12
62				
63	**Historical Overall Production Records Provided by CE**	**3 wks**	**Mon 8/27/12**	**Fri 9/14/12**
64				
65	**Existing Subsurface Piping Configuration Provided by CE**	**3 wks**	**Mon 8/27/12**	**Fri 9/14/12**
66				
67	**Net Replacement Volume Evaluation**	**35 days**	**Mon 9/17/12**	**Fri 11/2/12**
68	Establish Design Volume Criteria	4 wks	Mon 9/17/12	Fri 10/12/12
69	City Engineer Design Review and Approval	3 wks	Mon 10/15/12	Fri 11/2/12
70				
71	**Groundwater Modeling**	**90 days**	**Mon 9/17/12**	**Fri 1/18/13**
72	Information Acquisition	4 wks	Mon 9/17/12	Fri 10/12/12
73	Model Development/Input	6 wks	Mon 10/15/12	Fri 11/23/12
74	Model Test Runs Varying Scenarios	2 wks	Mon 11/26/12	Fri 12/7/12
75	MDEQ Land & Water Coordination	2 wks	Mon 12/10/12	Fri 12/21/12
76	MDOH Coordination	4 wks	Mon 12/24/12	Fri 1/18/13
77				
78	**Net Volume Replacement (Contingent Upon Above Evaluation)**	0 days	Fri 1/18/13	Fri 1/18/13
79				
80	**Well Siting**	**180 days**	**Mon 1/21/13**	**Fri 9/27/13**
81	Well Design	2 mons	Mon 1/21/13	Fri 3/15/13
82	Well Location Selection	2 mons	Mon 3/18/13	Fri 5/10/13
83	Location Acquisition	1 mon	Mon 5/13/13	Fri 6/7/13
84	MDOH/MDEQ L&W Permitting	2 mons	Mon 6/10/13	Fri 8/2/13
85	City Approval	2 mons	Mon 8/5/13	Fri 9/27/13
86				
87	**Well Installation**	**280 days**	**Mon 9/30/13**	**Fri 10/24/14**
88	Specification Preparation	2 mons	Mon 9/30/13	Fri 11/22/13
89	Bidding and Award	2 mons	Mon 11/25/13	Fri 1/17/14
90	Test Well Installation	2 mons	Mon 1/20/14	Fri 3/14/14
91	Well Installation (Contingent on Test)	6 mons	Mon 3/17/14	Fri 8/29/14
92	City Approval	2 mons	Mon 9/1/14	Fri 10/24/14
93				
94	**System Connection**	**350 days**	**Mon 3/17/14**	**Fri 7/17/15**
95	Piping Design	2 mons	Mon 3/17/14	Fri 5/9/14
96	City Engineer Approval	1 mon	Mon 5/12/14	Fri 6/6/14
97	Obtain Route Easements/Agreements	3 mons	Mon 6/9/14	Fri 8/29/14
98	Specification Preparation	2 mons	Mon 9/1/14	Fri 10/24/14
99	Bidding and Award	2 mons	Mon 10/27/14	Fri 12/19/14
100	Supply Piping Installation	6 mons	Mon 12/22/14	Fri 6/5/15
101	System Testing	1 mon	Mon 6/8/15	Fri 7/3/15
102	Well on Line	2 wks	Mon 7/6/15	Fri 7/17/15



Project: KEC Contingency Plan Sched
Date: Wed 6/6/12

Task | Progress | Summary | External Tasks | Deadline
Split | Milestone | Project Summary | External Milestone

Appendix I

Strategy Checklist

Strategy Checklist

Strategy 1: Near Term Water Treatment

A. Coordinate with city and MDOH for agreements to proceed
    i. Proposed technology approval
    ii. Placement of system
    iii. Monitoring requirements
B. Establish Treatment Needs/Goals
    i. Quantity of water required
    ii. Quality required for wells treated
    iii. Determine which wells will be treated (CSW-WA1, CSW-WA2, CSW-WA3, CSW-WA4, and/or CSW-WA7)
C. Advanced oxidation treatment system pilot study and design
    i. Conduct Bench/pilot study to demonstrate effectiveness and determine design parameters
    ii. Design treatment system
    iii. Determine optimum location
    iv. Determine required site modification
    v. Determine required piping modification
D. Design treatment system effectiveness monitoring plan
    i. Parameters
    ii. Schedule
    iii. Thresholds
    iv. Response Actions
E. Procurement
F. Implement site modifications
G. Startup system
H. Operate and maintain system

Strategy 2: Volume Replacement

I. Prepare groundwater model of existing wells

J. Use Model to Determine well(s) location(s)
    i. Evaluate the best suited location considering current piping, contaminant plume, and existing wells
    ii. Obtain property, leases, and/or easements for well(s)
K. Size well(s) according to existing capacity in coordination with city
L. Permit well(s)
    i. MDEQ
    ii. MDOH
M. Testing
N. Implementation
    i. Develop bid packages and manage bid process
    ii. Select contractors
    iii. Drill well(s)
        1. Log
        2. Oversight
    iv. Install conveyance piping
        1. QA/QC
        2. Construction management
    v. Connect to existing treatment plant