KENTUCKY AMERICAN WATER

HDR

KENTUCKY AMERICAN WATER
Filter Building Study – Richmond Road Station
Kickoff Meeting Minutes – 7/31/13

Attendees with Contact Information:

Name	Organization	E-mail	Phone
Brent Tippey	HDR	brent.tippey@hdrinc.com	859-629-4800
Matt Kusnir	HDR	matt.kusnir@hdrinc.com	859-629-4800
Larry Anderson	HDR	larry.anderson@hdrinc.com	859-629-4800
Eddie Alexander	FHCE	ealexander@fhce.com	859-252-6413 ext. 29
Sean Chapman	MSI Marine Solutions	schapman@msimarinesolutions.com	859-608-1716
Don Wilkins	MSI Marine Solutions	dwilkins@msimarinesolutions.com	859-559-2973
Zach Dukes	KAWC	zachery.dukes@amwater.com	859-268-6352
Brent O'Neill	KAWC	brent.oneill@amwater.com	859-268-6316
David Shehee	KAWC	david.shehee@amwater.com	859-335-3660
Nathan Clark	KAWC	nathan.clark@amwater.com	859-230-5440
Justin Sensabaugh	KAWC	justin.sensabaugh@amwater.com	859-268-6342
Kevin Kruchinski	KAWC	kevin.kruchinski@amwater.com	859-361-1770

General

- Project team and KAWC staff were introduced
- Zach will be primary contact point for KAWC.
- Contact Zach ahead of time before arriving/planning for a site visit. More time is needed ahead of schedule if KAWC must be present for site visit.
- Larry (electrical) will provide initial assessment and look at what makes sense with suggestions.
- The Roberts Group (HDR sub-consultant) will look at HVAC and any historical building impacts.
- KAWC will be evaluation chlorine and ammonia early next year
- Sign in sheets in control room when arriving
- Hard hats and safety glasses required in filter pipe gallery.
- Process safety training is required and will be setup during first dive inspection
- KAWC will need pre-approval on construction project for the filter building.
- HDR needs to provide KAWC planning level costs. The study will layout that basis for a rate case. HDR will involved national-level cost estimators to help ensure accurate and thorough estimate.
- Site visits to other facilities will be considered (if desired by KAWC) after options are reduced to several realistic choices
- Options will be vetted down (from 10-15) to a possible 3-5, then project will look more closely at the remaining options.

Clearwell / Structural Inspection

- Field inspection is first step in the project. Structural engineer will provide findings based on available drawings, field observations, and clearwell inspection

- Analysis will include look at current design versus modern design standards.
- Structural will focus on several 'problem' areas
- KAWC corporate study was completed on filter building with some analysis. HDR will do independent analysis and back check versus KAWC findings.
- Clearwell inspection shutdown is requested from 2-4 hours. More time is always more desirable. KAWC can likely give 4 hours, but would like at least 1 day notification.
- For clearwell inspection, sooner is better. Moderate weather with rain allows the clearwell to be shut down for longer extended periods of time.
- One access in/out of clearwell. MSI Marine Solutions were able to familiarize themselves with the current site.

Design / Study Issues

- Condition assessment will drive the options on the table for consideration
- KAWC is wide open currently on possible design scenarios
- No current expansion plans for RRS
- No 'deal-breaker' on filtration option technologies to look at, however cost can be a deal-breaker if too high
- Sustainable options include more generalized items such as natural light
- Screening metrics for the final choice need to be determined at a later time. HDR will work with KAWC on selecting metrics. Cost is a big issues and others will be determined.
- CT needs to be evaluated as a part of the study. Current CT varies widely throughout the year from very high (more than enough) to lower than desirable. CT can not be lessened. Baffles will be evaluated
- Outside filters are used in some KAWC plants (Illinois plant given as an example). The same concept will be evaluated as a part of the study.
- Adding plate settlers to the sedimentation basins will be considered. Currently KAWC has basins that are less than Ten States' allowable calculated capacity due to weir capacity. As a result, turbidity must be monitored by KAWC and reported to the state.
- Current chemical feed issue causes KAWC to always need 1 of 2 filters at back to be in operation. These filters 'distribute' the chemicals to the rest of the water.
- Access has been a big issue. May consider ideas such as insulating pipe versus de-humidifying area if necessary. KAWC is not favorable to a 'replace in kind' design.
- Wash water tank is too small and needs replaced. KAWC needs more internal discussion on this issue.
- Existing building will be looked at to be converted to for administrative usage if feasible. The operations group could use more space.
- The existing garage space is needed. If the footprint of the garage is needed, that space will have to be relocated.
- Nitrosamines, other currently unregulated DBPs are considered in this project as an awareness. While no definite answers on what will come with the regulations, the project team is aware treatment options must be able to produce higher water quality levels with every round of new regulation.
- TOC reduction currently provided by the GAC caps must also be provided by any new filtration method that is proposed. TOC reduction methods are considered in this project.

- SCADA was recently re-done. Since then, AW has made a change to use Allen Bradley. It will be evaluated to see what can be reused however KAWC will stick with one vendor.
- Monitoring equipment (such as online THM analyzer) will be considered as a part of this study

Information Requests

- Zach will distribute existing facility plans
- Matt will setup ftp site for large document distribution
- Operational guidance is needed from KAWC on target TOC, turbidity, DBPs, etc.
- Previous GAC study done by KAWC. Information will be provided if available.
- Schematic between clearwell and effluent is needed.
- KAWC will get SCADA programming to HDR

Schedule Items

- Clearwell inspection likely to occur within next two weeks.
- Time frame on any extended pilot tests (several months +) would likely be an issue
- Current schedule proposal:
    - Aug 16 – Structural condition assessment complete
    - Aug 28th – TMs complete
    - Aug 28th – Alternatives Workshop
    - Sept 5th – Options Screening Complete
    - Sept 10th – Review Meeting
    - Sept 25th – Draft final report of alternatives
    - Sept 30th – KAW review comments
    - Oct 4th – Final report issued

KENTUCKY AMERICAN WATER

HDR

KENTUCKY AMERICAN WATER
Filter Building Study – Richmond Road Station
Kickoff Meeting Minutes – 9/19/13

Attendees:

Name
Brent Tippey (HDR)
Matt Kusnir (HDR)
Zach Dukes (KAW)
David Shehee (KAW)
Nathan Clark (KAW)
Justin Sensabaugh (KAW)
Mike Morgan (KAW)

Project Update

- KAW staff was updated with inspections completed since most recent meeting
- Electrical summary: Larry Anderson from our office did the review. There is heavy corrosion everywhere and most everything needs to be replaced. With the confined spaces, this would be extremely difficult. The larger problem, however, relates to code. While the existing electrical may be grandfathered in from a code perspective, any replacement of the conduit, panels, etc would need to be brought up to current code. With the limited space available, it is likely impossible. New space would need to be created. Additionally, the lack of ventilation in the pipe gallery creates worries that any replacement would not be able to hold up for an extended period of time. Based on the electrical inspection, the filter building is recommended for replacement.
- Structural Inspection: Eddie Alexander completed the review. The floor above the pipe gallery is in bad shape. As you all know, there have been temporary columns added to help shore up the floor and those were definitely justified from Eddie's perspective. In order to continue operations, that floor should be replaced. While not impossible, the entire filter building would likely need to be shutdown. Because there is so little room in the pipe gallery, making temporary connections and bypasses to keep part of the building in service while the floor is being worked on may not be possible (or at least extremely improbable). During the inspection there was also some cracks/damage noticed on the outside of the clearwell walls that are exposed. These could be repaired, but the life expectancy of these repairs is not guaranteed. Eddie also noted cracking in the brick on the outside of the building. We understand some of that brick was recently repaired so this indicates that continued repairs may be necessary. Finally, with a building this old, there is concern that many other problems will continue to show over the next couple years. The overall recommendation of the structural assessment will be to replace the building.
- Historical registry was checked to see if RRS filter building was on the registry. It did not show up on the local or national registry.
- Overall recommendation will be to move forward with a new filter building

Technologies Considered

- Work at the sedimentation basins and membrane considerations were previously eliminated from consideration
- Two available options remaining
  - Build new filter building with GAC caps and sand
  - Build new filter building with more conventional mixed media approach and separate GAC contactors
- 'Replace in kind' can be a slightly modified version of the current filtration profile. A likely recommendation would be to increase sand layer from 6" to deeper such as 8" or 10".
- GAC contactors can be placed in a separate building or all housed with new filter under one roof
- Due to hydraulic profile, pumping from conventional filters to GAC contactors will likely be required

Other Considerations

- Ozone will not 'pay for itself' when looking at other chemical costs versus ozone capital/operational costs. Rather, ozone benefit is in the exceptional water quality.
- Ozone was considered as part of the initial options. Ozone will not be included in the final recommendation, however space will be accommodated if the need for future installation arises.
- No new clearwell capacity will be considered in the final recommendations
- CT considerations were initially discussed in the project as a part of a new clearwell or if the existing clearwell was going out of service. Because there is no change in clearwell storage, there are no CT considerations
- Filter sizing options were discussed. If a more conventional mixed media approach is used, a filtration rate of 5.0 GPM/sq. ft. would be used to reduce filter sizing
- If media w/ GAC caps is considered, the same filtration rate will be used for sizing purposes
- No future capacity expansion plans will be considered in the report
- GAC contactors would be initially designed for 5 minutes EBCT with walls thick enough to add media in the future up to 10 minutes EBCT.
- GAC contactors would provide operation flexibility in by-passing the contactors, if necessary during times of higher water quality. This would help extend the life of the media.

Aug 12, 2013 11:07:54 AM

From: Justin D Sensabaugh/KAWC/AWWSC < Justin.Sensabaugh@amwater.com >

To: William L Lynch/KAWC/AWWSC@AWW < William.Lynch@amwater.com > David M Moore/KAWC/AWWSC@AWW < David.Moore@amwater.com > Albert G Booker/KAW Albert.Booker@amwater.com > Mark D Chandler/KAWC/AWWSC@AWW < Mark.Chandler@amwater.com > Mark Mullins/KAWC/AWWSC@AWW < Mark.Mullins@amwa < Michael.Gray@amwater.com > Ken L Buehler/KAWC/AWWSC@AWW < Ken.Buehler@amwater.com > James D Sapp/KAWC/AWWSC@AWW < James.Sapp@amwate < Russell.Music@amwater.com > Michael D Maggard/KAWC/AWWSC@AWW < Michael.Maggard@amwater.com > Nathan A Clark/KAWC/AWWSC@AWW < Nathan.Cla Coy/KAWC/AWWSC@AWW < Timothy.Coy@amwater.com > Dorothy Johnson/KAWC/AWWSC@AWW < Dorothy.Johnson@amwater.com > Stanley A Coffey/KAWC/AW John C Davis/KAWC/AWWSC@AWW < John.Davis@amwater.com > Mitzi Combs/KAWC/AWWSC@AWW < Mitzi.Combs@amwater.com > Zachery B. Dukes/KAWC/AW Dalvin J Krug/KAWC/AWWSC@AWW < Dalvin.Krug@amwater.com > Douglas R Brooks/KAWC/AWWSC@AWW < Douglas.Brooks@amwater.com > R Kevin Kruchinski/K R.Kruchinski@amwater.com >

Subject: *****Important***RRS shutdown tomorrow for clearwell inspection 08-13-13**

RRS will be shutdown tomorrow around 9am for a clearwell inspection. Please have the tanks full and be ready for any additional load needed from the other plants. The shutdown is scheduled for 8 hours. Th with any additional questions.

****
Justin D. Sensabaugh
Operations Supervisor - Production
Kentucky American Water
2300 Richmond Road
Lexington, KY 40502
Office (859) 268-6342
Internal 7-533-6342
Cell (859) 455-6743
Fax (859) 335-3342
justin.sensabaugh@amwater.com

Attachments:

KENTUCKY AMERICAN WATER
Filter Building Study – Richmond Road Station
Project Update Agenda – 9/19/2013

Project Update

- Electrical Inspection
  - Replace and update to code: Not feasible
- Structural Inspection
  - Need to replace/repair operations floor
  - Other work needed
  - Recommend to replace
- Historic Registry : not listed
- Overall Recommendation: New Filter Building

Available Options

1. New Filter Building – replace in kind
2. New Filter Building – conventional filters, separate GAC

Other Considerations (applicable to either option)

1. Ozone
   a. No consideration , build provisions, or install
2. Clearwell
   a. Existing clearwell to be re-used
   b. Additional Capacity
3. CT – considerations?
4. Filter sizing
   a. 3.1 GPM/sq. ft (due to 6" sand depth?)
   b. More conventional allowance: 5.0 GPM / sq. ft
   c. 8 vs. 16 filters
5. Future Regulations
   a. How much security?
   b. How much ability to expand?

Schedule (unchanged)

- Draft Report: 9-26-13
- Receive Comments: 10-4-13
- Final Report: October 10-15-13

Empty Bed Contact Time (minutes)	Pounds of carbon	Pressures Vessels - Model 12-40 (40,000 pounds)	volume needed
5	380,000	10	11,141
10	750,000	19	22,282
15	1,130,000	29	33,422

Flow rate:	24,000,000	gallons/day
	3,208,556	cubic feet /day
	2228.163993	cubic feet / min
Density	33.7	lb/ft^3

KENTUCKY AMERICAN WATER
Filter Building Study – Richmond Road Station
Draft Report Agenda – 9/27/2013

1- Receive comments 10/4/13

2- No later than 10/15/13 -> issue final report

3- O&M data does not appear to justify anything but GAC cap approach

4- Recommend site visits (Dallas / Arlington)

5- Recommend pilot test

   a. Reduce project cost (3.1 GPM/sq. ft. to 5.0 GPM/sq. ft.)

   b. Potential justification on other options (contactors / ozone)

From: Tippey, Brent
Sent: Thursday, October 24, 2013 11:41 AM
To: zachery.dukes@amwater.com
Subject: Engineering Fees
Attachments: 3408_001.pdf

Hey Zach,

Following up our meeting from Tues, I thought I would forward this sliding fee schedule that is used to establish engineering fees on many projects in KY…Recognized by PSC as a useful metric on engineering costs.

As you can see, projects with construction costs around $10 m typically result in total engineering fees around 6.5%. This amount is reduced to approximately 4.5% -5.0% for design only services (design fee is approx. 70% of total fee shown on attached with bidding and construction administration being the remaining 30%) so its not a big part of the overall project cost.

Not trying to be a pest but just really interested in the project and know that schedule is important.

Let me know if you have questions or anything develops.

Brent

BRENT A. TIPPEY, P.E.

HDR Engineering
Vice President | Water Business Group Leader

2517 Sir Barton Way | Lexington, KY 40509
859.223.3755 office | 859.629.4831 direct | 859.221.5555 cell
Brent.Tippey@hdrinc.com | hdrinc.com

From: donotreply@abacuspcr.com [mailto:donotreply@abacuspcr.com]
Sent: Thursday, October 24, 2013 11:04 AM
To: Tippey, Brent
Subject: Attached Image

From: Kusnir, Matt
Sent: Wednesday, October 23, 2013 9:56 AM
To: Trent, Amanda; Newsome, Judy; Cheatham, Robyn
Cc: Tippey, Brent; Vanvooren, Patty
Subject: KAW Filter Assessment - Final report

Amanda, Judy, Robyn,

We got comments back from KAW yesterday on our report. They were very complimentary of the work and had only minor comments. I really appreciate everyone's effort that went into this.

The final step for them is getting the 'Draft' Report changed to a 'Final' Report and addressing some minor comments.

Robyn – Please remove DRAFT from the front cover and side
Judy / Amanda – Let me know who has some availability to help out.

Appendix A – no changes, ready to print
Appendix B – no changes, ready to print
Appendix E – no changes, ready to print
Appendix F – no changes, ready to print

The other sections have minor changes and will be ready to go shortly.

We'll need 5 copies total, and 1 electronic pdf copy. We've committed to delivery by next **Wednesday (10/30).**

Thanks,
Matt Kusnir

MATT KUSNIR
PE

HDR Engineering, Inc.
Water/Wastewater Engineer

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From: Tippey, Brent
Sent: Tuesday, October 15, 2013 8:58 AM
To: 'Zachery.Dukes@amwater.com'; Kevin.Kruchinski@amwater.com
Cc: Kusnir, Matt; Anderson, Larry
Subject: RE: Richmond Road Study

Do you guys have any communication with your military services group? We put Filter Magic in at Fort Meade MD for American Water military Services. We haven't heard of any problems. Sean Wheatly was the chief operator. You might contact him and see if the performance has been satisfactory.

I can call him but you wouldn't be hearing it first-hand. Let me know if you want us to inquire.

No problem on the study review. Just want to make sure we are not holding anything up.

Brent

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859.223.3755 office | 859.629.4831 direct | 859.221.5555 cell Brent.Tippey@hdrinc.com | hdrinc.com

-----Original Message-----
From: Zachery.Dukes@amwater.com [mailto:Zachery.Dukes@amwater.com]
Sent: Tuesday, October 15, 2013 8:44 AM
To: Kevin.Kruchinski@amwater.com
Cc: Tippey, Brent; Kevin Kruchinski (r.kevin.kruchinski@amwater.com)
Subject: Re: Richmond Road Study

Under drains, pneumatic valves and controls system aside, the compact/simplistic design they use for the filters/pile gallery/backwash isn't bad. I'm guessing the design isn't proprietary.

Zach

Zachery B. Dukes, P.E.
Project Manager Engineer
Kentucky American Water
2300 Richmond Road
Lexington, KY 40502

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Cell (859) 537-0750
zachery.dukes@amwater.com
www.amwater.com

From: Ronald K Kruchinski/KAWC/AWWSC
To: "Tippey, Brent" <Brent.Tippey@hdrinc.com>
Cc: Zachery B. Dukes/KAWC/AWWSC@aww, "Kevin Kruchinski (r.kevin.kruchinski@amwater.com)" <r.kevin.kruchinski@amwater.com>
Date: 10/15/2013 08:36 AM
Subject:Re: Richmond Road Study

No such thing as magic. Just my opinion.

Kevin Kruchinski
Production Superintendent
Kentucky American Water
2300 Richmond Rd Lexington, KY 40502
r.kruchinski@amwater.com
P 859-335-3418 M 859-361-1770

For quality and value, tap water is the clear choice.

On Oct 15, 2013, at 8:14 AM, "Tippey, Brent" <Brent.Tippey@hdrinc.com> wrote:

Hey Zach/Kevin,

Checking in to see how the review is coming…

Also – Mark Romers from Filter Magic is coming to see me on 10/31. I'm sure he has tried to see you. Do you have any thoughts about that system?

Brent

|----------+
| Brent A. tippey,|HDR Engineering
| P.E.|Vice President | Water Business Group Leader
|----------+
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| |859.221.5555 cell
| |Brent.Tippey@hdrinc.com | hdrinc.com
|----------+

From: Tippey, Brent
Sent: Tuesday, October 15, 2013 8:14 AM
To: zachery.dukes@amwater.com; Kevin Kruchinski (r.kevin.kruchinski@amwater.com)
Subject: Richmond Road Study

Hey Zach/Kevin,

Checking in to see how the review is coming…

Also – Mark Romers from Filter Magic is coming to see me on 10/31. I'm sure he has tried to see you. Do you have any thoughts about that system?

Brent

BRENT A. TIPPEY, P.E.

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Brent.Tippey@hdrinc.com | hdrinc.com

From: Lauderdale, Chance
Sent: Monday, October 14, 2013 5:52 PM
To: Martinez, Roy; Atoulikian, Rich; Tippey, Brent; Kalisiak, Kip; Talbot, Peter; Pembroke, Jim; Frissora, Joseph; D'Adamo, Peter
Subject: WatrerRF 4459 Biofiltration Knowledge Base Presentation on Preliminary Findings
Attachments: North American Biofiltration Application and Practicesv2.pdf

All,

The attached reflects the presentation provided at IOA and what will be given at the upcoming WQTC. It provides an overview of our survey project and includes some initial findings/results. In particular, the drivers and conditions for implementation may be of particular interest as you speak to clients on the merits of biofiltration and/or where it may be applicable.

Please let me know if you have any questions. You're welcome to pass this on to anyone else that may have interest.

Best regards,

CHANCE LAUDERDALE
Ph.D., P.E.*
*FL,TX

HDR Engineering, Inc.
Vice President
Water Treatment Business Class Director

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From: Lauderdale, Chance
Sent: Wednesday, October 02, 2013 1:28 PM
To: Tippey, Brent
Cc: Kusnir, Matt; D'Adamo, Peter
Subject: Pre-Ozone for Microflocculation/Decreased Coagulant Only (Osange WTP, Amarillo, TX)
Attachments: 1997 Osage DM Sections_3_4_5_6_D.PDF

Gentlemen,

Please see attached report. Amarillo, TX is one a select few utilities that have implemented pre-ozone only for the benefits of microflocculation (not disinfection credit, no T&O removal). I have attached a copy of the engineering report that justifies this application.

This should serve as good reference material when we promote the cost-benefit of ozone…..citing the benefits of microflocculation for decreased coagulant usage + all of the other benefits we realize once we start increasing the dose and couple the process with biofiltration. Please let me know if you have any questions. I also believe Todd Townsend and/or Joel Cantwell could likely provide you with additional project specific information.

Best regards,

Chance

From: Kusnir, Matt
Sent: Thursday, September 26, 2013 11:39 AM
To: zachery.dukes@amwater.com
Cc: Tippey, Brent
Subject: Filter assessment report

Zach,

I'll drop off 4 sets of the draft report tomorrow (let me know if we need to provide more/less).

Brent and I would like to meet with you and any others that are available tomorrow. We though meeting you for lunch may work. There are a couple of loose ends we'd like to make sure we tie-up before receiving comments and ultimately issuing the final report.

Let me know if you're available for lunch tomorrow. If not, I'll bring the reports by and drop them off for you.

Thanks,
Matt

MATT KUSNIR
PE

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Water/Wastewater Engineer

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From: Eddie Alexander <ealexander@fhce.com>
Sent: Wednesday, September 25, 2013 12:38 PM
To: Kusnir, Matt; Tippey, Brent
Subject: RE: KAWC - Revised Draft Report
Attachments: Structural discipline memo_9-25-13.pdf

See below for comments.

Eddie Alexander
Freeland Harris Consulting Engineers
201 West Short Street
Suite 410
Lexington, Kentucky 40507
(859) 252-6413 ext. 29
(859) 252-6418 fax
(859) 339-6848 cell

From: Kusnir, Matt [mailto:Matthew.Kusnir@hdrinc.com]
Sent: Wednesday, September 25, 2013 11:38 AM
To: Eddie Alexander; Tippey, Brent
Subject: RE: KAWC - Revised Draft Report

1- You use first person references so under the title put something like- By: Eddie Alexander, P.E. (Freeland Harris Consulting Engineers) Added
2- Change 'galley' to 'gallery' – this appears multiple times Ok
3- Under filters, you say the cracks should be 'further analyzed…' Can you clarify what this means? If it is something like destructive testing, then note that. Or if further analysis requires additional information that we don't have, then that's OK too but please note. Maybe its something like further analyzed over time for continued cracking, etc. Certain people may read that in different ways. I removed the comment about further analyzed and simple stated that the cracks should be repaired.
4- Change footers to remove NKWD reference Changed it to KAWC (thanks for catching this)

Everything else looks fine. Thanks for the effort.

-Matt

From: Eddie Alexander [mailto:ealexander@fhce.com]
Sent: Wednesday, September 25, 2013 10:09 AM
To: Kusnir, Matt; Tippey, Brent
Subject: KAWC - Revised Draft Report

Here is the revised draft.

Eddie Alexander
Freeland Harris Consulting Engineers
201 West Short Street

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(859) 252-6413 ext. 29
(859) 252-6418 fax
(859) 339-6848 cell

From: Eddie Alexander <ealexander@fhce.com>
Sent: Wednesday, September 25, 2013 10:09 AM
To: Kusnir, Matt; Tippey, Brent
Subject: KAWC - Revised Draft Report
Attachments: Structural discipline memo_9-25-13.pdf

Here is the revised draft.

Eddie Alexander
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(859) 252-6418 fax
(859) 339-6848 cell

From: Kusnir, Matt
Sent: Tuesday, September 24, 2013 3:45 PM
To: Tippey, Brent
Subject: KAW estimates
Attachments: Copy of Preliminary Cost Estimates - KAW BAT 083013.xlsx

MATT KUSNIR
PE

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From: Tippey, Brent
Sent: Monday, September 23, 2013 9:59 AM
To: Kusnir, Matt
Subject: FW: East St Louis
Attachments: IAW-ESL Workshop 1.docx

Not exactly same scope but worth reviewing…

BRENT A. TIPPEY, P.E.
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Brent.Tippey@hdrinc.com | hdrinc.com

From: Quail, Steven
Sent: Friday, June 28, 2013 11:12 AM
To: Tippey, Brent; Dostal, Glenn
Subject: RE: East St Louis

Brent,

This is the summary of our condition assessment that will be included as an appendix in the final report.

STEVEN J. QUAIL P.E., BCEE
HDR Engineering, Inc.
Senior Project Manager

6300 S. Old Village Place, Suite 100 | Sioux Falls, SD 57108-2102
605.977.7768 | c: 605.214.4681
steven.quail@hdrinc.com | hdrinc.com

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From: Tippey, Brent
Sent: Friday, June 28, 2013 9:57 AM
To: Dostal, Glenn; Quail, Steven
Subject: East St louis

Do either of you have a draft report or the RFP in electronic form. I would like to pull out some info from these if possible.

BRENT A. TIPPEY, P.E.
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Brent.Tippey@hdrinc.com | hdrinc.com

From: Kusnir, Matt
Sent: Monday, September 23, 2013 9:56 AM
To: Tippey, Brent
Subject: American Water

Please send link or report for that other AW study that was done.

MATT KUSNIR
PE

HDR Engineering, Inc.
Water/Wastewater Engineer

2517 Sir Barton Way | Lexington, KY 40509
office: 859.629.4800 | direct: 859.629.4885 | fax: 859.629.4801
matt.kusnir@hdrinc.com | hdrinc.com

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From: Kusnir, Matt
Sent: Monday, September 23, 2013 9:55 AM
To: zachery.dukes@amwater.com
Cc: Tippey, Brent
Subject: Filter Building capacity

Zach,

Got a question on filter building capacity:

What is the ultimate design capacity that is needed and does it include redundancy?

When calculating from the MORs, 15 filters provide about 24 MGD (with 1 filter out of service for backwash, etc.). I know the RFP and other sources show RRS as a 25 MGD plant. This is a minor cost impact issue (24 MGD vs 25 MGD) however we want to be clear on the report.

Thanks,
Matt

MATT KUSNIR
PE

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Water/Wastewater Engineer

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From: Kusnir, Matt
Sent: Monday, September 23, 2013 8:09 AM
To: zachery.dukes@amwater.com
Cc: Tippey, Brent
Subject: Meeting Minutes - 9-19-13
Attachments: Minutes 9-19-13.pdf

Zach,

Attached are the meeting minutes from Thursday. Please distribute to your team and let me know if there are any comments.

Thanks,
Matt Kusnir

MATT KUSNIR
PE

HDR Engineering, Inc.
Water/Wastewater Engineer

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matt.kusnir@hdrinc.com | hdrinc.com

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From: Kusnir, Matt
Sent: Monday, September 23, 2013 8:06 AM
To: Larue, John
Cc: Tippey, Brent
Subject: KAW Filter Study - QC review

John,

Could you review our Kentucky American Water filter study this Wednesday (9/25)?

Let me know if that's possible. If not, I'll find another.

Thanks,
Matt Kusnir

MATT KUSNIR
PE

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Water/Wastewater Engineer

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matt.kusnir@hdrinc.com | hdrinc.com

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From: Zachery.Dukes@amwater.com
Sent: Friday, September 20, 2013 7:53 AM
To: Kusnir, Matt
Cc: Tippey, Brent
Subject: Fw: Leaking filter build. Picture
Attachments: pic00636.jpg

FYI

Zachery B. Dukes, P.E.
Project Manager Engineer
Kentucky American Water
2300 Richmond Road
Lexington, KY 40502

Office (859) 268-6352
Cell (859) 537-0750
zachery.dukes@amwater.com
www.amwater.com
----- Forwarded by Zachery B. Dukes/KAWC/AWWSC on 09/20/2013 07:52 AM -----

From: Michael D Maggard/KAWC/AWWSC
To: Zachery B. Dukes/KAWC/AWWSC@aww
Date: 09/19/2013 02:33 PM
Subject:Leaking filter build. Picture

(Embedded image moved to file: pic00636.jpg)

Mike Maggard
Sr. Specialist Maintenance Service
Kentucky American Water
2300 Richmond Rd.
Lexington, Ky. 40502
office (859) 268-6348
cell (859)321-3674

e-mail michael.maggard@amwater.com

From: Kusnir, Matt
Sent: Thursday, September 19, 2013 3:36 PM
To: ealexander@fhce.com
Cc: Tippey, Brent; Anderson, Larry
Subject: KAW - Filter Study Update

Eddie,

Meeting went very well today. We are turning in a rough draft of the final report next Wednesday for them to review and comment. For our report, we'll include your structural assessment and Larry's electrical assessment as appendices.

I do have one question I'd like you to address in your report that came up today:

1- Can the existing clearwell stay in service? (assume you demo the rest of the building)

Let me know your thoughts on this issue.

Thanks,
Matt

MATT KUSNIR
PE

HDR Engineering, Inc.
Water/Wastewater Engineer

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From: Sean Chapman <schapman@msimarinesolutions.com>
Sent: Tuesday, September 17, 2013 2:36 PM
To: Tippey, Brent; ealexander@fhce.com; Kusnir, Matt
Cc: John Loftus III
Subject: RE: Draft KAW Clear Well Inspection Report
Attachments: MSI13032R01 - FINAL.pdf

Matt,

Apologize for the phone tag. Per your voice mail I contacted Eddie Alexander and verified that he did not have any comments or revisions to the draft KAW clear well underwater inspection report. The final report is attached. Please let me know if would like paper copies or anything further.

We enjoyed participating in this project and I hope we have the opportunity to work together again soon.

Thank you,
Sean

Marine Solutions, Inc.

Sean Chapman, PE
(859) 260-1055
(859) 554-4100 fax
(859) 608-1716 cell
schapman@MSImarinesolutions.com
www.msimarinesolutions.com

From: Sean Chapman
Sent: Monday, August 19, 2013 11:56 PM
To: brent.tippey@hdrinc.com; 'ealexander@fhce.com'
Subject: Draft KAW Clear Well Inspection Report

Hello Brent and Eddie,

The draft underwater inspection report for the KAW clear well inspection is attached. It looks like an email I sent earlier today got kicked back due to issues with our server. As such, please confirm receipt of this email and the attached report file. We are also sending over DVDs with the video and photo files from the inspection along with a photo/video log.

Please let me know if you have any questions or comments regarding the report.

Thank you,
Sean

Marine Solutions, Inc.

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schapman@MSImarinesolutions.com
www.msimarinesolutions.com

From: Eddie Alexander <ealexander@fhce.com>
Sent: Tuesday, September 17, 2013 2:24 PM
To: Kusnir, Matt
Cc: Tippey, Brent
Subject: RE: KAW - clearwell inspection

Matt, I talked with Sean about this earlier today. I don't have any comments.

Eddie Alexander
Freeland Harris Consulting Engineers
201 West Short Street
Suite 410
Lexington, Kentucky 40507
(859) 252-6413 ext. 29
(859) 252-6418 fax
(859) 339-6848 cell

From: Kusnir, Matt [mailto:Matthew.Kusnir@hdrinc.com]
Sent: Tuesday, September 17, 2013 2:06 PM
To: ealexander@fhce.com
Cc: Tippey, Brent
Subject: KAW - clearwell inspection

Eddie,

Did you have any comments on the clearwell inspection that needed to be addressed or clarified? Sean Chapman at Marine Solutions wanted to try to finalize the report.

Thanks,
Matt Kusnir

MATT KUSNIR
PE

HDR Engineering, Inc.
Water/Wastewater Engineer

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matt.kusnir@hdrinc.com | hdrinc.com

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From: Kusnir, Matt
Sent: Monday, September 16, 2013 9:56 AM
To: zachery.dukes@amwater.com
Cc: ealexander@fhce.com; Tippey, Brent; Anderson, Larry
Subject: RRS Filter Building - Project Update

Zach,

A couple updates since our last meeting:

- Electrical/controls inspection of the existing filter building was undertaken. Larry Anderson from our office did the review. There is heavy corrosion everywhere and most everything needs to be replaced. With the confined spaces, this would be extremely difficult. The larger problem, however, relates to code. While the existing electrical may be grandfathered in from a code perspective, any replacement of the conduit, panels, etc would need to be brought up to current code. With the limited space available, it is likely impossible. New space would need to be created. Additionally, the lack of ventilation in the pipe gallery creates worries that any replacement would not be able to hold up for an extended period of time. Based on the electrical inspection, the filter building is recommended for replacement.
- Structural inspection of the existing filter building was also completed. Eddie Alexander completed the review. The floor above the pipe gallery is in bad shape. As you all know, there have been temporary columns added to help shore up the floor and those were definitely justified from Eddie's perspective. In order to continue operations, that floor should be replaced. While not impossible, the entire filter building would likely need to be shutdown. Because there is so little room in the pipe gallery, making temporary connections and bypasses to keep part of the building in service while the floor is being worked on may not be possible (or at least extremely improbable). During the inspection there was also some cracks/damage noticed on the outside of the clearwell walls that are exposed. These could be repaired, but the life expectancy of these repairs is not guaranteed. Eddie also noted cracking in the brick on the outside of the building. We understand some of that brick was recently repaired so this indicates that continued repairs may be necessary. Finally, with a building this old, there is concern that many other problems will continue to show over the next couple years. The overall recommendation of the structural assessment will be to replace the building.
- Ozone: The ozone option has the potential to provide excellent water quality at the plant and improved quality throughout the distribution system. From a cost perspective ozone will NOT pay for itself when analyzing chemical costs. Ozone as a micro-flocculant will reduce other chemical costs but a dollar to dollar comparison will not justify it alone. There are also water quality angles to consider. Less growth potential in the distribution system would mean less flushing is necessary, however without hard data we could not show this as a 'cost-saver.' We've got lots of information on ozone and bio-filtration if you all are interested, including brown-bag presentations.
- As I noted to you earlier, the filter building is not on any historical registry. This is good for the demo option
- Upon further review, retro-fitting the existing building into office/admin space is not recommended. As I noted earlier, the structural work to rehab the existing floor is extensive. Additionally, converting the filter building to office space will require lots of money to retro-fit for insulation and generally make the area suitable for occupancy. At the price tag shown at our previous meeting ($1 million +), the office space must be able to provide you all with definite needs. We discussed there are only a handful of people that need the additional space, and the filter building area is too large for too little people. A better use of the money would be building a smaller admin building separately at a more modest cost and smaller size.
- It will be our overall recommendation to move forward with a new filter building. The new building will provide you all with a more user friendly maintenance environment and ensure all electrical and structural codes meet

modern standards. Additionally, filtration can be optimized with few filters. We'll continue to look into the GAC options (whether separate or combined and how hydraulic grade through the WTP may be affected)

- One item for consideration is the existing clearwell and how we may re-use it. Also, while building new, additional clearwell capacity should be considered and hydraulic grades also need to be considered (e.g. – will the hydraulic grade line create a need for a new pumping stage to move water). Many of these decisions are somewhat interlinked in the conversation on CT and also hinge on details such as whether ozone will be included. For cost estimating purposes, I'd recommend we estimate the cost of a new clearwell into the project and then see how we may optimize the size as design approaches.

Sorry for such a long email but I was unsure if we were going to have a project update meeting. Please pass this information along to relevant team members. If necessary, we could have a meeting tomorrow at 1 p.m. covering the information outlined above. I would expect it to be relatively short as we work towards our final report draft submittal.

Let me know any other questions that may arise.

Thanks,
Matt Kusnir

MATT KUSNIR
PE

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Water/Wastewater Engineer

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From: Kusnir, Matt
Sent: Friday, September 06, 2013 11:55 AM
To: Anderson, Larry
Cc: ealexander@fhce.com; Tippey, Brent
Subject: Kentucky Americans - deadline
Attachments: Structural discipline memo_8-1-13.doc; Structural Photos .doc

Larry,

Please have the TM/report ready by **Friday September 20th.**

Our next review meeting with KAW is Sept 16th. At that time, we'll report that the basic conclusions from the structural and electrical evaluations are:

- Electrical: everything is in bad shape. Must be replaced. When its replaced, it must be brought up to code. (which may not be possible give tight spaces)
- Structural: Floor is in bad shape. Needs to be removed and replaced. Other issues (bricks cracking, filter walls outside the building). Needs immediate work
- Neither electrical or structural work could be completed without gutting the pipe gallery and significant shut-down periods.

Larry- I've attached a TM Eddie did for NKWD. Please follow the same format. I'll include the electrical and structural TMs/reports as appendices in my final report to KAW.

Thanks,
Matt

MATT KUSNIR
PE

HDR Engineering, Inc.
Water/Wastewater Engineer

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From: Kusnir, Matt
Sent: Thursday, September 05, 2013 7:45 AM
To: Lauderdale, Chance
Cc: Tippey, Brent
Subject: RE: Ky-Am Water Filtration Study - follow-up

Chance,

Our next meeting is Sept 16. We'd like to have some information to share with them at that point (even if it is just preliminary, we can refine numbers/data later)

If we miss that date, it would not be a huge deal. Sept 25th is our draft report deliverable date. It would be good to include any business case info in that draft of the report. We'll meet with KAW shortly after issuing the draft and get their comments by Oct 4.

We'll incorporate their comments in our report and the final product is turned in October 15.

Recap:
9/16 – Review meeting
9/25 – Draft final report
10/4 – KAW Review comments
10/15 – Final report issued

Thank you,
Matt

From: Lauderdale, Chance
Sent: Tuesday, September 03, 2013 3:22 PM
To: Kusnir, Matt
Cc: Tippey, Brent
Subject: RE: Ky-Am Water Filtration Study - follow-up

Matt,

It was great speaking with you both as well. It sounded like your meeting went well with Ky-Am Water. I would be happy to help however I can. I should be able to send you some presentations quickly on biofiltration, as those are at my finger tips and already created. The business cases may take a little more time to pull together something meaningful. When do you need this by?

Best regards,

Chance

From: Kusnir, Matt
Sent: Monday, September 02, 2013 7:22 PM
To: Lauderdale, Chance
Cc: Tippey, Brent
Subject: Ky-Am Water Filtration Study - follow-up

Chance,

Thanks for talking with Brent and myself about ozone / biological treatment options. We had our review meeting with KAW on Friday morning and it went pretty well. A couple items:

- Ozone seems to be a viable option but we are fighting two fronts for ozone usage: 1- Cost (can we make a business case for it) 2- Familiarity: Some staff seems very nervous about ozone usage (unfamiliar, potential dangers)

Basically our goal is to determine if ozone has a business case (reduction of coagulants, reduce of chlorine residual leaving plant, etc) and education of KAW on benefits of ozone. Based on our conversation, you mentioned a business case is sometimes made for ozone as a micro-flocculant and also mentioned you have several powerpoint slides on ozone/biological treatment.

If you can, would you be able to provide any of the following:
1- Case studies, power points, articles etc. that quantitatively make a business case for ozone (i.e. - City of XXXX used to feed 100 ppm of coagulant now feeds 20 ppm with 0.5 ppm of Ozone, or City of XXXX used to leave the plant at 3.0 ppm Cl2 now feeds 1.0 ppm ozone post-sedimentation and leaves plant at 1.5 ppm Cl2)
2- Powerpoint presentation on 'What is Ozone' with bio-filtration, etc (something that would be a nice brownbag presentation)

We know you're pulled in many directions... Any help is greatly appreciated.

Let me know if there is anything I need to clarify on or provide more details. Thanks for the consideration.

-Matt Kusnir

From: Kusnir, Matt
Sent: Thursday, August 29, 2013 4:18 PM
To: Tippey, Brent
Subject: FW: KAW Richmond Road WTP (Ozone)
Attachments: 1 x 500(10) Syst_Lexington KY_8-29-13.pdf

From: Jason Bivins [mailto:jason@delaneyandassociatesinc.com]
Sent: Thursday, August 29, 2013 2:18 PM
To: Kusnir, Matt
Cc: Jerry Delaney
Subject: KAW Richmond Road WTP (Ozone)

Matt,

A rough budgetary estimate is attached. Below are some typical footprint dimensions of for the major equipment components.

Ozone Generator/PSU skid
L 144 in.
W 96 in.
H 106 in.

Ozone Destruct Skid
L 64 in.
W 56 in.
H 106 in.

Supplemental Nitrogen Skid
L 80 in.
W 40 in.
H 48 in.

Cooling Water Skid (if required)
L 72 in.
W 72 in.
H 48 in.

Obviously, this is pretty general given the timeframe for completion. We can go into more detail when time permits. Until then, please let me know if you have any questions or need additional information.

Best Regards,

Jason Bivins, P.E.
Delaney & Associates, Inc.
23 Erlanger RD.
Erlanger, KY 41018
Ph: 859-342-4944
FX: 859-342-8331
Email: jason@delaneyandassociatesinc.com
Web: www.delaneyandassociatesinc.com

From: Kusnir, Matt
Sent: Thursday, August 29, 2013 3:06 PM
To: Tippey, Brent
Subject: KAW
Attachments: Options Summary - Bullet Points.docx

MATT KUSNIR
PE

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Water/Wastewater Engineer

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matt.kusnir@hdrinc.com | hdrinc.com

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From: Sean Chapman <schapman@msimarinesolutions.com>
Sent: Monday, August 19, 2013 11:56 PM
To: Tippey, Brent; ealexander@fhce.com
Subject: Draft KAW Clear Well Inspection Report
Attachments: MSI13032R01 - DRAFT.pdf

Hello Brent and Eddie,

The draft underwater inspection report for the KAW clear well inspection is attached. It looks like an email I sent earlier today got kicked back due to issues with our server. As such, please confirm receipt of this email and the attached report file. We are also sending over DVDs with the video and photo files from the inspection along with a photo/video log.

Please let me know if you have any questions or comments regarding the report.

Thank you,
Sean

Marine Solutions, Inc.

Sean Chapman, PE
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(859) 554-4100 fax
(859) 608-1716 cell
schapman@MSImarinesolutions.com
www.msimarinesolutions.com

From: Davis, Calvin R (WT) <calvin.r.davis@siemens.com>
Sent: Friday, August 16, 2013 12:48 PM
To: Davis, Calvin R (WT); Kusnir, Matt
Cc: Tippey, Brent; Gary Lubin
Subject: RE: KAW - Filter Building part 3 of 3
Attachments: CP240 Unit GA.pdf; 13P1290CPD MEMCOR 7 x CP240 RevB.pdf

Matt,

Here's the last email with drawings for CP system.

KAW would need 9 CP240 skids, not just 7 as shown on the attached. These skids can be arranged in a long singe row or separated into two rows (Stockton, CA has two rows of CP skids).

With best regards,
C. Russell Davis

Technical Sales Manager, Memcor Products
Siemens Water Technologies LLC
1812 Fargo Blvd
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Fax: +1 (978) 323-0854
Mobile: +1 (630) 248-9096
mailto:calvin.r.davis@siemens.com
www.siemens.com/water

From: Davis, Calvin R (WT)
Sent: Friday, August 16, 2013 11:39 AM
To: 'Kusnir, Matt'
Cc: 'Tippey, Brent'; 'Gary Lubin'
Subject: RE: KAW - Filter Building part 2 of 3

Matt,

Here are some CS drawings for a comparable 24 MGD submerged design..

With best regards,
C. Russell Davis

Technical Sales Manager, Memcor Products
Siemens Water Technologies LLC
1812 Fargo Blvd

Geneva, IL 60134
Tel.: +1 (630) 248-9096
Fax: +1 (978) 323-0854
Mobile: +1 (630) 248-9096
mailto:calvin.r.davis@siemens.com
www.siemens.com/water

From: Davis, Calvin R (WT)
Sent: Friday, August 16, 2013 11:18 AM
To: 'Kusnir, Matt'
Cc: 'Tippey, Brent'; Gary Lubin
Subject: RE: KAW - Filter Building part 1 of 3

Matt,

Following up on our conversation from last week, here is a summary comparing a 24 MGD submerged and pressurized membrane system.

Also attached are membrane spec sheets for S10N (submerged membrane module) and L20N (pressurized membrane module).

Finally attached is a copy of a presentation given at the South West Membrane Operators Association (SWMOA) 2013 Symposium. The City of Stockton, CA hired CDM on a design-build basis to provide a 30 MGD water treatment plant using membrane filtration. CDM could have built either a submerged or pressurized system, but selected pressurized. There are some good pictures of what this looks like.

I will be sending you two more emails, one with drawings for what a submerged system would look like and the for a pressurized system.

With best regards,
C. Russell Davis

Technical Sales Manager, Memcor Products
Siemens Water Technologies LLC
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Geneva, IL 60134
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Fax: +1 (978) 323-0854
Mobile: +1 (630) 248-9096
mailto:calvin.r.davis@siemens.com
www.siemens.com/water

From: Gary Lubin [mailto:Glubin@hpthompson.com]
Sent: Wednesday, August 14, 2013 3:01 PM
To: 'Kusnir, Matt'
Cc: 'Tippey, Brent'; Davis, Calvin R (WT)
Subject: RE: KAW - Filter Building

Matt,

I spoke to Russ just now. Per his original plan in response to your request, he will have proposals to you by the end of this week.

In the meantime you could check out the Siemens Memcor CP (custom pressurized) system on this web page:

http://www.water.siemens.com/en/products/membrane_filtration_separation/ultrafiltration_membrane_systems/Pages/memcor_product_cp_membrane_system.aspx
and the following web page for their CS (custom submerged) system:

http://www.water.siemens.com/en/products/membrane_filtration_separation/microfiltration_membrane_systems/Pages/MEMCOR%20CS%20Submerged%20Systems.aspx

Gary

From: Kusnir, Matt [mailto:Matthew.Kusnir@hdrinc.com]
Sent: Tuesday, August 13, 2013 4:18 PM
To: Gary Lubin; 'calvin.r.davis@siemens.com'
Cc: Tippey, Brent
Subject: RE: KAW - Filter Building

This is for Richmond Rd. Let me know what information you all need.

We need to get moving ASAP to meet deadlines.

Thank you,
Matt Kusnir

From: Gary Lubin [mailto:Glubin@HPThompson.Com]
Sent: Tuesday, August 13, 2013 4:06 PM
To: Kusnir, Matt; 'calvin.r.davis@siemens.com'
Cc: Tippey, Brent
Subject: RE: KAW - Filter Building

Thanks Matt. I assume this is for the Richmond Road WTP in Lexington? Is that correct? I cannot think of a better person to get help from than Russ. He has been doing membranes forever it seems. Gary

---

From: Kusnir, Matt [mailto:Matthew.Kusnir@hdrinc.com]
Sent: Wednesday, August 07, 2013 6:01 PM
To: calvin.r.davis@siemens.com
Cc: Gary Lubin; Tippey, Brent
Subject: KAW - Filter Building

Russ

Thanks for talking to me on the phone today about our project with Kentucky American. We are studying the filter building and potentially looking to replace their filters with a new technology, with membranes being a very real possibility.

We'd like to look present both gravity and pressure as options, and would like to get some standard drawings on the equipment, etc to get a feel for size of building needed. We'll also need to work with Gary on getting costs put together.

I mis-spoke earlier on capacity. They have 16 filters with a total rated capacity of 24 MGD.

Please send us drawings and literature on the submersible and pressure membrane options. We'll go through the information and ask questions. Any questions or additional information you need, we will try to provide.

Thanks for the consideration,
Matt

MATT KUSNIR
PE

HDR Engineering, Inc.
Water/Wastewater Engineer

2517 Sir Barton Way | Lexington, KY 40509
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From: Davis, Calvin R (WT) <calvin.r.davis@siemens.com>
Sent: Friday, August 16, 2013 12:39 PM
To: Kusnir, Matt
Cc: Tippey, Brent; Gary Lubin
Subject: RE: KAW - Filter Building part 2 of 3
Attachments: P12410010-1&2.pdf; P12410010-3-4&5.pdf

Matt,

Here are some CS drawings for a comparable 24 MGD submerged design..

With best regards,
C. Russell Davis

Technical Sales Manager, Memcor Products
Siemens Water Technologies LLC
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Geneva, IL 60134
Tel.: +1 (630) 248-9096
Fax: +1 (978) 323-0854
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mailto:calvin.r.davis@siemens.com
www.siemens.com/water

From: Davis, Calvin R (WT)
Sent: Friday, August 16, 2013 11:18 AM
To: 'Kusnir, Matt'
Cc: 'Tippey, Brent'; Gary Lubin
Subject: RE: KAW - Filter Building part 1 of 3

Matt,

Following up on our conversation from last week, here is a summary comparing a 24 MGD submerged and pressurized membrane system.

Also attached are membrane spec sheets for S10N (submerged membrane module) and L20N (pressurized membrane module).

Finally attached is a copy of a presentation given at the South West Membrane Operators Association (SWMOA) 2013 Symposium. The City of Stockton, CA hired CDM on a design-build basis to provide a 30 MGD water treatment plant using membrane filtration. CDM could have built either a submerged or pressurized system, but selected pressurized. There are some good pictures of what this looks like.

I will be sending you two more emails, one with drawings for what a submerged system would look like and the for a pressurized system.

With best regards,
C. Russell Davis

Technical Sales Manager, Memcor Products
Siemens Water Technologies LLC
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Geneva, IL 60134
Tel.: +1 (630) 248-9096
Fax: +1 (978) 323-0854
Mobile: +1 (630) 248-9096
mailto:calvin.r.davis@siemens.com
www.siemens.com/water

From: Gary Lubin [mailto:Glubin@hpthompson.com]
Sent: Wednesday, August 14, 2013 3:01 PM
To: 'Kusnir, Matt'
Cc: 'Tippey, Brent'; Davis, Calvin R (WT)
Subject: RE: KAW - Filter Building

Matt,

I spoke to Russ just now. Per his original plan in response to your request, he will have proposals to you by the end of this week.

In the meantime you could check out the Siemens Memcor CP (custom pressurized) system on this web page:

http://www.water.siemens.com/en/products/membrane_filtration_separation/ultrafiltration_membrane_systems/Pages/memcor_product_cp_membrane_system.aspx
and the following web page for their CS (custom submerged) system:

http://www.water.siemens.com/en/products/membrane_filtration_separation/microfiltration_membrane_systems/Pages/MEMCOR%20CS%20Submerged%20Systems.aspx

Gary

From: Kusnir, Matt [mailto:Matthew.Kusnir@hdrinc.com]
Sent: Tuesday, August 13, 2013 4:18 PM
To: Gary Lubin; 'calvin.r.davis@siemens.com'
Cc: Tippey, Brent
Subject: RE: KAW - Filter Building

This is for Richmond Rd. Let me know what information you all need.

We need to get moving ASAP to meet deadlines.

Thank you,
Matt Kusnir

From: Gary Lubin [mailto:Glubin@HPThompson.Com]
Sent: Tuesday, August 13, 2013 4:06 PM
To: Kusnir, Matt; 'calvin.r.davis@siemens.com'
Cc: Tippey, Brent
Subject: RE: KAW - Filter Building

Thanks Matt. I assume this is for the Richmond Road WTP in Lexington? Is that correct? I cannot think of a better person to get help from than Russ. He has been doing membranes forever it seems. Gary

---

From: Kusnir, Matt [mailto:Matthew.Kusnir@hdrinc.com]
Sent: Wednesday, August 07, 2013 6:01 PM
To: calvin.r.davis@siemens.com
Cc: Gary Lubin; Tippey, Brent
Subject: KAW - Filter Building

Russ

Thanks for talking to me on the phone today about our project with Kentucky American. We are studying the filter building and potentially looking to replace their filters with a new technology, with membranes being a very real possibility.

We'd like to look present both gravity and pressure as options, and would like to get some standard drawings on the equipment, etc to get a feel for size of building needed. We'll also need to work with Gary on getting costs put together.

I mis-spoke earlier on capacity. They have 16 filters with a total rated capacity of 24 MGD.

Please send us drawings and literature on the submersible and pressure membrane options. We'll go through the information and ask questions. Any questions or additional information you need, we will try to provide.

Thanks for the consideration,
Matt

MATT KUSNIR
PE

HDR Engineering, Inc.
Water/Wastewater Engineer

2517 Sir Barton Way | Lexington, KY 40509
office: 859.629.4800 | direct: 859.629.4885 | fax: 859.629.4801
matt.kusnir@hdrinc.com | hdrinc.com

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From: Davis, Calvin R (WT) <calvin.r.davis@siemens.com>
Sent: Friday, August 16, 2013 12:18 PM
To: Kusnir, Matt
Cc: Tippey, Brent; Gary Lubin
Subject: RE: KAW - Filter Building part 1 of 3
Attachments: Matt Kusnir, 8-15-13.doc; MGS00tps_L20NSpecSheet_Issue03.pdf; MGS00tps_S10NSpecSheet_Issue02.pdf; SWMOA Stockton Delta Water Supply Project April 2013.pdf

Matt,

Following up on our conversation from last week, here is a summary comparing a 24 MGD submerged and pressurized membrane system.

Also attached are membrane spec sheets for S10N (submerged membrane module) and L20N (pressurized membrane module).

Finally attached is a copy of a presentation given at the South West Membrane Operators Association (SWMOA) 2013 Symposium. The City of Stockton, CA hired CDM on a design-build basis to provide a 30 MGD water treatment plant using membrane filtration. CDM could have built either a submerged or pressurized system, but selected pressurized. There are some good pictures of what this looks like.

I will be sending you two more emails, one with drawings for what a submerged system would look like and the for a pressurized system.

With best regards,
C. Russell Davis

Technical Sales Manager, Memcor Products
Siemens Water Technologies LLC
1812 Fargo Blvd
Geneva, IL 60134
Tel.: +1 (630) 248-9096
Fax: +1 (978) 323-0854
Mobile: +1 (630) 248-9096
mailto:calvin.r.davis@siemens.com
www.siemens.com/water

From: Gary Lubin [mailto:Glubin@hpthompson.com]
Sent: Wednesday, August 14, 2013 3:01 PM
To: 'Kusnir, Matt'
Cc: 'Tippey, Brent'; Davis, Calvin R (WT)
Subject: RE: KAW - Filter Building

Matt,

I spoke to Russ just now. Per his original plan in response to your request, he will have proposals to you by the end of this week.

In the meantime you could check out the Siemens Memcor CP (custom pressurized) system on this web page:

http://www.water.siemens.com/en/products/membrane_filtration_separation/ultrafiltration_membrane_systems/Pages/memcor_product_cp_membrane_system.aspx
and the following web page for their CS (custom submerged) system:

http://www.water.siemens.com/en/products/membrane_filtration_separation/microfiltration_membrane_systems/Pages/MEMCOR%20CS%20Submerged%20Systems.aspx

Gary

From: Kusnir, Matt [mailto:Matthew.Kusnir@hdrinc.com]
Sent: Tuesday, August 13, 2013 4:18 PM
To: Gary Lubin; 'calvin.r.davis@siemens.com'
Cc: Tippey, Brent
Subject: RE: KAW - Filter Building

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Matt Kusnir

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Sent: Tuesday, August 13, 2013 4:06 PM
To: Kusnir, Matt; 'calvin.r.davis@siemens.com'
Cc: Tippey, Brent
Subject: RE: KAW - Filter Building

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Sent: Wednesday, August 07, 2013 6:01 PM
To: calvin.r.davis@siemens.com
Cc: Gary Lubin; Tippey, Brent
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Please send us drawings and literature on the submersible and pressure membrane options. We'll go through the information and ask questions. Any questions or additional information you need, we will try to provide.

Thanks for the consideration,
Matt

MATT KUSNIR
PE

HDR Engineering, Inc.
Water/Wastewater Engineer

2517 Sir Barton Way | Lexington, KY 40509
office: 859.629.4800 | direct: 859.629.4885 | fax: 859.629.4801
matt.kusnir@hdrinc.com | hdrinc.com

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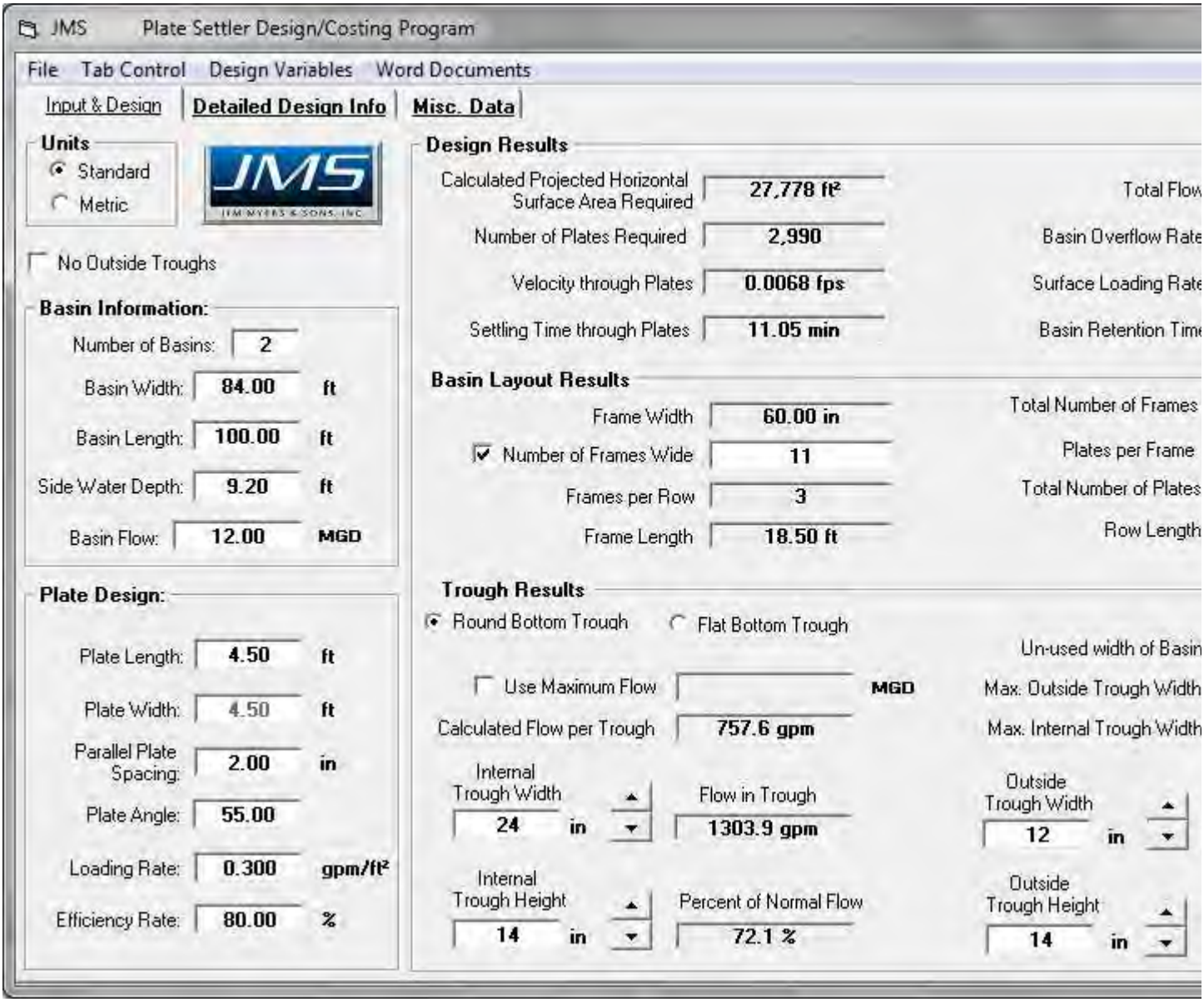
From: Kerry Dissinger <kdissinger@myersequipment.com>
Sent: Friday, August 16, 2013 9:58 AM
To: Kusnir, Matt; Tippey, Brent; Gary Lubin
Cc: Dave Myers; Josh Franks; Jim Brettman
Subject: Lexington, KY WTP: Kentucky American, 24-MGD JMS Plate Settler System and possible sludge removal,, Gary Lubin (HPT) & Matt Kusnir (HDR)

Matt,

Appreciate you giving me a call this morning to discuss this project.

Attached is our recommended plate settler design/layout. Please review and lets discuss any questions you may have. Once there is agreement on the design I can provide a budget cost and get engineering working on an AutoCAD layout drawing.



Thanks,

Kerry Dissinger
Sales Manager

Jim Myers & Sons, Inc.
704.554.8397 (office)
484.333.1178 (mobile)
kdissinger@myersequipment.com
www.myersequipment.com

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From: Kusnir, Matt [mailto:Matthew.Kusnir@hdrinc.com]
Sent: Friday, August 16, 2013 9:26 AM
To: Gary Lubin; Kerry Dissinger; Dave Myers; Josh Franks; Jim Brettman
Cc: Tippey, Brent
Subject: RE: Kentucky American - Plate Settlers

To follow up on our discussion, I called KAW to get some additional information:

- Side water depth is 9' 2"
- The sludge collectors are 4 years old but "a maintenance nightmare" ….replacement is definitely an option

Let me know what else you may need.

Thanks,
Matt

From: Gary Lubin [mailto:Glubin@HPThompson.Com]
Sent: Friday, August 16, 2013 7:49 AM
To: 'Kerry Dissinger'; Kusnir, Matt; 'Dave Myers'; 'Josh Franks'; 'Jim Brettman'
Cc: Tippey, Brent
Subject: RE: Kentucky American - Plate Settlers

I would like to be on the line too. I might learn something.

From: Kerry Dissinger [mailto:kdissinger@myersequipment.com]
Sent: Thursday, August 15, 2013 4:42 PM
To: Kusnir, Matt; Dave Myers; Josh Franks; Jim Brettman
Cc: Gary Lubin; Tippey, Brent
Subject: RE: Kentucky American - Plate Settlers

Matt,

Appreciate the inquiry.

Please give me a call tomorrow morning to review.

Thanks,

Kerry Dissinger
Sales Manager

Jim Myers & Sons, Inc.
704.554.8397 (office)
484.333.1178 (mobile)
kdissinger@myersequipment.com
www.myersequipment.com

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From: Kusnir, Matt [mailto:Matthew.Kusnir@hdrinc.com]
Sent: Thursday, August 15, 2013 4:28 PM
To: Kerry Dissinger; Dave Myers; Josh Franks; Jim Brettman
Cc: Gary Lubin (Glubin@HPThompson.Com); Tippey, Brent
Subject: Kentucky American - Plate Settlers

All,

Hope things are going well.

I'm working with Kentucky American Water on a study in Lexington and we are looking at the idea of dropping submersible membranes into the existing sedimentation basins. In order for this to happen we need to modify the walls, etc in the basins and add in plate settlers to buy us some additional space.

The current plant is rated for 24 MGD. That capacity needs to remain after the modifications. The attached drawings should give you an idea of the space we are working with.

I'd like to request some pricing information and general layout drawings to get a feel for what space we can 'shave off' the basins and devote to membranes. We're working on a pretty tight deadline and would like to get pricing information and layout information by the end of next week.

I'll follow-up with a phone call tomorrow.

Thank you for the consideration,
Matt Kusnir

MATT KUSNIR
PE

HDR Engineering, Inc.
Water/Wastewater Engineer

2517 Sir Barton Way | Lexington, KY 40509
office: 859.629.4800 | direct: 859.629.4885 | fax: 859.629.4801
matt.kusnir@hdrinc.com | hdrinc.com

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From: Kenny Graham <KGraham@southernsalesinc.com>
Sent: Thursday, August 15, 2013 7:22 PM
To: Kusnir, Matt
Cc: Ellis King; Tippey, Brent; Manson Clement
Subject: Re: Kentucky American - plate settlers

Thanks Kurt. We will follow-up with Chris at MRI and get back with you.

Also, I spoke to Manson regarding the Membranes and he and I will be spear-heading that proposal / process.

Kenny Graham
Southern Sales Co.
Sent from my iPhone

On Aug 15, 2013, at 4:29 PM, "Kusnir, Matt" <Matthew.Kusnir@hdrinc.com> wrote:

> All,
>
> Hope things are going well.
>
> I'm working with Kentucky American Water on a study in Lexington and we are looking at the idea of dropping submersible membranes into the existing sedimentation basins. In order for this to happen we need to modify the walls, etc in the basins and add in plate settlers to buy us some additional space.
>
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>
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>
> I'll follow-up with a phone call tomorrow.
>
> Thank you for the consideration,
> Matt Kusnir
>
>
> matt kusnir
> PE
>
> HDR Engineering, Inc.
> Water/Wastewater Engineer
>
> 2517 Sir Barton Way | Lexington, KY 40509
> office: 859.629.4800 | direct: 859.629.4885 | fax: 859.629.4801
> matt.kusnir@hdrinc.com<mailto:matt.kusnir@hdrinc.com> |
> hdrinc.com<http://www.hdrinc.com/>
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> YouTube<http://www.youtube.com/HDRinc>
>
>
>
> <KAW.PDF>

From: Zachery.Dukes@amwater.com
Sent: Monday, August 12, 2013 11:14 AM
To: Tippey, Brent
Cc: Brent.O'Neill@amwater.com; Kevin Kruchinski; David.Shehee@amwater.com
Subject: Fw: GAC at RRS
Attachments: Kentucky-American 130717.pdf; Kentucky-American 130717.xls; pic12027.gif; pic01920.jpg; pic10805.gif

Brent,
The below issue regarding Cyanobacteria is one we would like to make you aware of during your study of the RRS Filter Building. Without taking too much time to look into this it is unclear to me if GAC contactors would resolve this issue or be a cost effective solution to this problem.

Zach

Zachery B. Dukes, P.E.
Project Manager Engineer
Kentucky American Water
2300 Richmond Road
Lexington, KY 40502

Office (859) 268-6352
Cell (859) 537-0750
zachery.dukes@amwater.com
www.amwater.com
----- Forwarded by Zachery B. Dukes/KAWC/AWWSC on 08/12/2013 11:05 AM -----

From: David Shehee/KAWC/AWWSC
To: Zachery B. Dukes/KAWC/AWWSC@AWW
Cc: Ronald K Kruchinski/KAWC/AWWSC@AWW, Brent E O'Neill/SERVCO/AWWSC@AWW
Date: 08/07/2013 02:38 PM
Subject: GAC at RRS

Zach,

One thing I forgot to mention to HDR when we had our meeting was that Jacobson Reservoir has Cyanobacteria in it. These are Blue/Green algae that are often taste and odor causers but also are potentially toxic. While we should be able to address them through our coppering program, they also are removed by GAC and in terms of safety I would consider that a critical need. Can you pass this on as they are considering GAC contactors at RRS? I would think we could have them set up to bypass when we are on the KY River (if that isn't too cost prohibitive up front). I am attaching our latest information on the reservoir for your perusal.

(See attached file: Kentucky-American 130717.pdf)(See attached file: Kentucky-American 130717.xls)

Thanks,

David

_____

David B. Shehee
Superintendent, Water Quality and Environmental Compliance
(Embedded image moved to file: pic12027.gif)
www.kentuckyamwater.com
2300 Richmond Road | Lexington | Kentucky 40502 (859.335.3660 | 7 859.335.3388 | * david.shehee@amwater.com

For quality and value, tap water is the clear choice.

_____

(Embedded image moved to file: pic01920.jpg)bgGS Email Sig1
(Embedded image moved to file:
pic10805.gif)
Please consider the environment before printing this email.

From: Tippey, Brent
Sent: Wednesday, June 26, 2013 4:34 PM
To: 'Zachery.Dukes@amwater.com'; ronald.kruchinski@amwater.com
Subject: RE: RRS Site Visit

Is Kevin or anyone available at either 9:30 or 2:00? Those times would be great on our end...

Thanks for the consideration.

Brent

BRENT A. TIPPEY, P.E.
HDR Engineering
Vice President | Water Business Group Leader

2517 Sir Barton Way | Lexington, KY 40509
859.223.3755 office | 859.629.4831 direct | 859.221.5555 cell Brent.Tippey@hdrinc.com | hdrinc.com

-----Original Message-----
From: Zachery.Dukes@amwater.com [mailto:Zachery.Dukes@amwater.com]
Sent: Wednesday, June 26, 2013 4:08 PM
To: Tippey, Brent
Subject: Re: RRS Site Visit

You can definitely visit Friday but I will be up in Northern Kentucky that day.

Zach

Zachery B. Dukes, P.E.
Project Manager Engineer
Kentucky American Water
2300 Richmond Road
Lexington, KY 40502

Office (859) 268-6352
Cell (859) 537-0750
zachery.dukes@amwater.com
www.amwater.com

From: "Tippey, Brent" <Brent.Tippey@hdrinc.com>
To: "zachery.dukes@amwater.com" <zachery.dukes@amwater.com>
Date: 06/26/2013 01:59 PM
Subject:RRS Site Visit

Hey Zach,

Hope things are well…

Any chance we can get a site visit on Friday at RRS? I made a mistake in your e-mail address and sent a couple into space earlier this week.

Also – did you guys ever find a site plan with utilities that could be distributed.

|----------+
| Brent A. tippey,|HDR Engineering
| P.E.|Vice President | Water Business Group Leader
|----------+
| |2517 Sir Barton Way | Lexington, KY 40509
| |859.223.3755 office | 859.629.4831 direct |
| |859.221.5555 cell
| |Brent.Tippey@hdrinc.com | hdrinc.com
|----------+

WPC Abstract

Kusnir, Matt to: Zachery.Dukes@amwater.com 12/08/2013 08:24 PM

History: This message has been replied to.

Zach,

Take a look at the attached and provide comments. I'm getting a couple others to review it as well. These are due by this Friday (12/13). I'll try to get submitted by Thursday...

Let me know what you think and what edits we may need to make. I'll get them incorporated ASAP.

Thanks,

Matt Abstract - The Next Generation for Kentucky American Water Filtration.docx

Filter Study - Executive Summary
Kusnir, Matt to: zachery.dukes@amwater.com 11/27/2013 09:48 AM

Zach,

Let me know if this will work for what you are looking for. We can cut it down (or expand) if needed.

I'll follow-up with you later…

Thanks,
Matt

matt kusnir PE
HDR Engineering, Inc.
Water/Wastewater Engineer
2517 Sir Barton Way | Lexington, KY 40509
office: 859.629.4800 | direct: 859.629.4885 | fax: 859.629.4801
matt.kusnir@hdrinc.com | hdrinc.com
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Executive Summary.pdf

Water Professional Conference - abstract/presentation

Kusnir, Matt to: zachery.dukes@amwater.com 11/18/2013 04:06 PM

History: This message has been replied to.

Zach,

The Water Professional's Conference isn't until July but abstracts for presentations are due mid-December. Our recent study on the filter building is a great opportunity for a presentation. Thinking about what you all wanted, the options we considered, and ultimately why a decision was made on one option versus the others will be something many people would be interested to hear (as a point of reference, we did a similar presentation with the engineering report for Williamstown WTP last year and it was well received).

Generally, the conference is a nice time to get some good public speaking practice and raise the profile of your company and yourself as an individual. I had good luck last year giving two presentations, including one where I co-presented with David Hawes (who is the executive director) from the Regional Water Resource Agency in Owensboro. Overall, it was a very positive experience for me.

Let me know if you're interested in co-presenting on the filter building study. With your all's permission, I have an abstract I'd like to submit for consideration. If accepted, we'll need to have a 20-25 minute slideshow presentation prepared and then be ready for a 2-3 minute Q&A afterwards. If this isn't your thing, but someone like Kevin or David may be interested, I'd be happy to work with them. I'll do all the 'heavy-lifting' on the abstract and putting together the presentation so its not a big time commitment.

Let me know what you think…

Thanks,
Matt Kusnir

matt kusnir PE
HDR Engineering, Inc.
Water/Wastewater Engineer
2517 Sir Barton Way | Lexington, KY 40509
office: 859.629.4800 | direct: 859.629.4885 | fax: 859.629.4801
matt.kusnir@hdrinc.com | hdrinc.com
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RE: Final Draft - RRS Filter Building Evaluation
Kusnir, Matt to: Zachery.Dukes@amwater.com 10/30/2013 03:08 PM
Cc: "Tippey, Brent"

Download Slingshot file(s) | New User? Click here.
Final KAW RRS Filter Bldg Report_103013.pdf;

Access Slingshot.hdrinc.com home page

Zach,

See the attached (via slingshot). Let me know if the changes are acceptable and if any others are needed.

Thanks,
Matt

-----Original Message-----
From: Zachery.Dukes@amwater.com [mailto:Zachery.Dukes@amwater.com]
Sent: Wednesday, October 30, 2013 3:03 PM
To: Kusnir, Matt
Subject: Re: Final Draft - RRS Filter Building Evaluation

Matt,
Please shoot me a revised, electronic version of the study when you have it.

Thanks,
Zach

Zachery B. Dukes, P.E.
Project Manager Engineer
Kentucky American Water
2300 Richmond Road
Lexington, KY 40502

Office (859) 268-6352
Cell (859) 537-0750
zachery.dukes@amwater.com
www.amwater.com

From: "Kusnir, Matt" <Matthew.Kusnir@hdrinc.com>
To: "zachery.dukes@amwater.com" <zachery.dukes@amwater.com>
Cc: "Tippey, Brent" <Brent.Tippey@hdrinc.com>
Date: 10/29/2013 10:47 AM
Subject: Final Draft - RRS Filter Building Evaluation

Download Slingshot file(s) | New User? Click here.

Final KAW RRS Filter Bldg Report.pdf;

Access Slingshot.hdrinc.com home page

Zach,

Attached (via slingshot), is the final draft for the RRS filter building study. The instructions to download should be fairly straight-forward but if there are issues let me know and I can burn the file onto a CD or upload to a different FTP site.

The only item not included as part of the .pdf is Appendix D, which is a DVD of the clearwell inspection.

As for the hard copies, I'll bring them by your office around lunch today and drop them off for you at the front desk.

If you or anyone else has any additional questions / comments, please let us know.

Thanks,
Matt Kusnir

|---
| matt kusnir|HDR Engineering, Inc.
| PE|Water/Wastewater Engineer
|---
| |2517 Sir Barton Way | Lexington, KY 40509
| |office: 859.629.4800 | direct: 859.629.4885 | fax:
| |859.629.4801
| |matt.kusnir@hdrinc.com | hdrinc.com
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[attachment "Slingshot.txt" deleted by Zachery B. Dukes/KAWC/AWWSC] Slingshot.txt

Final Draft - RRS Filter Building Evaluation

Kusnir, Matt to: zachery.dukes@amwater.com 10/29/2013 10:47 AM
Cc: "Tippey, Brent"

History: This message has been replied to.

Download Slingshot file(s) | New User? Click here.
Final KAW RRS Filter Bldg Report.pdf;

Access Slingshot.hdrinc.com home page

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Thanks,
Matt Kusnir

matt kusnir PE
HDR Engineering, Inc.
Water/Wastewater Engineer
2517 Sir Barton Way | Lexington, KY 40509
office: 859.629.4800 | direct: 859.629.4885 | fax: 859.629.4801
matt.kusnir@hdrinc.com | hdrinc.com
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Slingshot.txt

Engineering Fees
Tippey, Brent to: zachery.dukes@amwater.com 10/24/2013 11:41 AM
History: This message has been forwarded.

Hey Zach,

Following up our meeting from Tues, I thought I would forward this sliding fee schedule that is used to establish engineering fees on many projects in KY…Recognized by PSC as a useful metric on engineering costs.

As you can see, projects with construction costs around $10 m typically result in total engineering fees around 6.5%. This amount is reduced to approximately 4.5% -5.0% for design only services (design fee is approx. 70% of total fee shown on attached with bidding and construction administration being the remaining 30%) so its not a big part of the overall project cost.

Not trying to be a pest but just really interested in the project and know that schedule is important.

Let me know if you have questions or anything develops.

Brent

Brent A. tippey, P.E.
HDR Engineering
Vice President | Water Business Group Leader
2517 Sir Barton Way | Lexington, KY 40509
859.223.3755 office | 859.629.4831 direct | 859.221.5555 cell
Brent.Tippey@hdrinc.com | hdrinc.com

From: donotreply@abacuspcr.com [mailto:donotreply@abacuspcr.com]
Sent: Thursday, October 24, 2013 11:04 AM
To: Tippey, Brent
Subject: Attached Image

3408_001.pdf

RE: Richmond Road Study

Tippey, Brent to: Zachery.Dukes@amwater.com, Kevin.Kruchinski@amwater.com 10/15/2013 08:58 AM

Cc: "Kusnir, Matt", "Anderson, Larry"

History: This message has been replied to.

Do you guys have any communication with your military services group? We put Filter Magic in at Fort Meade MD for American Water military Services. We haven't heard of any problems. Sean Wheatly was the chief operator. You might contact him and see if the performance has been satisfactory.

I can call him but you wouldn't be hearing it first-hand. Let me know if you want us to inquire.

No problem on the study review. Just want to make sure we are not holding anything up.

Brent

BRENT A. TIPPEY, P.E.
HDR Engineering
Vice President | Water Business Group Leader

2517 Sir Barton Way | Lexington, KY 40509
859.223.3755 office | 859.629.4831 direct | 859.221.5555 cell
Brent.Tippey@hdrinc.com | hdrinc.com

-----Original Message-----
From: Zachery.Dukes@amwater.com [mailto:Zachery.Dukes@amwater.com]
Sent: Tuesday, October 15, 2013 8:44 AM
To: Kevin.Kruchinski@amwater.com
Cc: Tippey, Brent; Kevin Kruchinski (r.kevin.kruchinski@amwater.com)
Subject: Re: Richmond Road Study

Under drains, pneumatic valves and controls system aside, the compact/simplistic design they use for the filters/pile gallery/backwash isn't bad. I'm guessing the design isn't proprietary.

Zach

Zachery B. Dukes, P.E.
Project Manager Engineer
Kentucky American Water
2300 Richmond Road
Lexington, KY 40502

Office (859) 268-6352
Cell (859) 537-0750
zachery.dukes@amwater.com
www.amwater.com

From: Ronald K Kruchinski/KAWC/AWWSC
To: "Tippey, Brent" <Brent.Tippey@hdrinc.com>
Cc: Zachery B. Dukes/KAWC/AWWSC@aww, "Kevin Kruchinski

(r.kevin.kruchinski@amwater.com)"
<r.kevin.kruchinski@amwater.com>
Date: 10/15/2013 08:36 AM
Subject: Re: Richmond Road Study

No such thing as magic. Just my opinion.

Kevin Kruchinski
Production Superintendent
Kentucky American Water
2300 Richmond Rd Lexington, KY 40502
r.kruchinski@amwater.com
P 859-335-3418 M 859-361-1770

For quality and value, tap water is the clear choice.

On Oct 15, 2013, at 8:14 AM, "Tippey, Brent" <Brent.Tippey@hdrinc.com> wrote:

Hey Zach/Kevin,

Checking in to see how the review is coming…

Also – Mark Romers from Filter Magic is coming to see me on 10/31. I'm sure he has tried to see you. Do you have any thoughts about that system?

Brent

|---|---|
| Brent A. tippey, P.E. | HDR Engineering
Vice President \| Water Business Group Leader |
| | 2517 Sir Barton Way \| Lexington, KY 40509
859.223.3755 office \| 859.629.4831 direct \|
859.221.5555 cell
Brent.Tippey@hdrinc.com \| hdrinc.com |

Filter assessment report
Kusnir, Matt to: zachery.dukes@amwater.com 09/26/2013 11:39 AM
Cc: "Tippey, Brent"
History: This message has been replied to.

Zach,

I'll drop off 4 sets of the draft report tomorrow (let me know if we need to provide more/less).

Brent and I would like to meet with you and any others that are available tomorrow. We though meeting you for lunch may work. There are a couple of loose ends we'd like to make sure we tie-up before receiving comments and ultimately issuing the final report.

Let me know if you're available for lunch tomorrow. If not, I'll bring the reports by and drop them off for you.

Thanks,
Matt

matt kusnir PE
HDR Engineering, Inc.
Water/Wastewater Engineer
2517 Sir Barton Way | Lexington, KY 40509
office: 859.629.4800 | direct: 859.629.4885 | fax: 859.629.4801
matt.kusnir@hdrinc.com | hdrinc.com
Follow Us - Facebook | Twitter | YouTube

Meeting Minutes - 9-19-13

Kusnir, Matt to: zachery.dukes@amwater.com 09/23/2013 08:09 AM
Cc: "Tippey, Brent"

Zach,

Attached are the meeting minutes from Thursday. Please distribute to your team and let me know if there are any comments.

Thanks,
Matt Kusnir

matt kusnir PE
HDR Engineering, Inc.
Water/Wastewater Engineer
2517 Sir Barton Way | Lexington, KY 40509
office: 859.629.4800 | direct: 859.629.4885 | fax: 859.629.4801
matt.kusnir@hdrinc.com | hdrinc.com
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Minutes 9-19-13.pdf

FW: RRS Contract Appendix

Tippey, Brent to: zachery.dukes@amwater.com 09/19/2013 05:26 PM

History: This message has been replied to.

Hey Zach – I revised the contract to lump sum which was the proposed method of payment rather than hourly. Execute if you concur.

Thanks.

Brent

Brent A. tippey, P.E.
HDR Engineering
Vice President | Water Business Group Leader
2517 Sir Barton Way | Lexington, KY 40509
859.223.3755 office | 859.629.4831 direct | 859.221.5555 cell
Brent.Tippey@hdrinc.com | hdrinc.com

From: donotreply@abacuspcr.com [mailto:donotreply@abacuspcr.com]
Sent: Thursday, September 19, 2013 4:57 PM
To: Tippey, Brent
Subject: Attached Image

3145_001.pdf

Leaking filter build . Picture
Michael D Maggard to: Zachery B. Dukes 09/19/2013 02:33 PM
History: This message has been forwarded .

Mike Maggard
Sr. Specialist Maintenance Service
Kentucky American Water
2300 Richmond Rd.
Lexington, Ky. 40502
office (859) 268-6348
cell (859)321-3674

e-mail michael.maggard@amwater.com

RE: RRS Contract

Tippey, Brent to: Zachery.Dukes@amwater.com 09/16/2013 10:54 AM

History: This message has been replied to.

Hey Zach,

Looks good except change consultant from Strand to HDR at bottom of document.

Brent

BRENT A. TIPPEY, P.E.
HDR Engineering
Vice President | Water Business Group Leader

2517 Sir Barton Way | Lexington, KY 40509
859.223.3755 office | 859.629.4831 direct | 859.221.5555 cell
Brent.Tippey@hdrinc.com | hdrinc.com

-----Original Message-----
From: Zachery.Dukes@amwater.com [mailto:Zachery.Dukes@amwater.com]
Sent: Friday, September 13, 2013 9:05 AM
To: Tippey, Brent
Subject: Fw: RRS Contract

If you find this to be in order please sign and return.

(See attached file: KY-13-HDR-01pdf.PDF)

Zachery B. Dukes, P.E.
Project Manager Engineer
Kentucky American Water
2300 Richmond Road
Lexington, KY 40502

Office (859) 268-6352
Cell (859) 537-0750
zachery.dukes@amwater.com
www.amwater.com
----- Forwarded by Zachery B. Dukes/KAWC/AWWSC on 09/13/2013 09:04 AM -----

From: "Tippey, Brent" <Brent.Tippey@hdrinc.com>
To: "zachery.dukes@amwater.com" <zachery.dukes@amwater.com>
Date: 09/10/2013 07:50 AM
Subject: RRS Contract

Hey Zach,

Had a quick one that I should have caught. Our office manager was filing the contract for the RRS study and noticed that it did not have an Appendix A which provides the definition of the scope and fee. Any chance you could look it over and see if we just didn't get that part of the contract.

If it was omitted , perhaps we could add a very short description of work and

our fee. I think that would make it whole.

Really sorry for the hassle – I should have caught this earlier.

Any help appreciated.

Brent

|--------------------+
| Brent A. tippey, |HDR Engineering
| P.E. |Vice President | Water Business Group Leader
|--------------------+
| |2517 Sir Barton Way | Lexington, KY 40509
| |859.223.3755 office | 859.629.4831 direct |
| |859.221.5555 cell
| |Brent.Tippey@hdrinc.com | hdrinc.com
|--------------------+

RRS Filter Building - Project Update

Kusnir, Matt to: zachery.dukes@amwater.com 09/16/2013 09:56 AM

Cc: "ealexander@fhce.com", "Tippey, Brent" , "Anderson, Larry"

History: This message has been forwarded.

Zach,

A couple updates since our last meeting:

- Electrical/controls inspection of the existing filter building was undertaken. Larry Anderson from our office did the review. There is heavy corrosion everywhere and most everything needs to be replaced. With the confined spaces, this would be extremely difficult. The larger problem, however, relates to code. While the existing electrical may be grandfathered in from a code perspective, any replacement of the conduit, panels, etc would need to be brought up to current code. With the limited space available, it is likely impossible. New space would need to be created. Additionally, the lack of ventilation in the pipe gallery creates worries that any replacement would not be able to hold up for an extended period of time. Based on the electrical inspection, the filter building is recommended for replacement.
- Structural inspection of the existing filter building was also completed. Eddie Alexander completed the review. The floor above the pipe gallery is in bad shape. As you all know, there have been temporary columns added to help shore up the floor and those were definitely justified from Eddie's perspective. In order to continue operations, that floor should be replaced. While not impossible, the entire filter building would likely need to be shutdown. Because there is so little room in the pipe gallery, making temporary connections and bypasses to keep part of the building in service while the floor is being worked on may not be possible (or at least extremely improbable). During the inspection there was also some cracks/damage noticed on the outside of the clearwell walls that are exposed. These could be repaired, but the life expectancy of these repairs is not guaranteed. Eddie also noted cracking in the brick on the outside of the building. We understand some of that brick was recently repaired so this indicates that continued repairs may be necessary. Finally, with a building this old, there is concern that many other problems will continue to show over the next couple years. The overall recommendation of the structural assessment will be to replace the building.
- Ozone: The ozone option has the potential to provide excellent water quality at the plant and improved quality throughout the distribution system. From a cost perspective ozone will NOT pay for itself when analyzing chemical costs. Ozone as a micro-flocculant will reduce other chemical costs but a dollar to dollar comparison will not justify it alone. There are also water quality angles to consider. Less growth potential in the distribution system would mean less flushing is necessary, however without hard data we could not show this as a 'cost-saver.' We've got lots of information on ozone and bio-filtration if you all are interested, including brown-bag presentations.
- As I noted to you earlier, the filter building is not on any historical registry. This is good for the demo option
- Upon further review, retro-fitting the existing building into office/admin space is not recommended. As I noted earlier, the structural work to rehab the existing floor is extensive. Additionally, converting the filter building to office space will require lots of money to retro-fit for insulation and generally make the area suitable for occupancy. At the price tag shown at our

previous meeting ($1 million +), the office space must be able to provide you all with definite needs. We discussed there are only a handful of people that need the additional space, and the filter building area is too large for too little people. A better use of the money would be building a smaller admin building separately at a more modest cost and smaller size.

- It will be our overall recommendation to move forward with a new filter building. The new building will provide you all with a more user friendly maintenance environment and ensure all electrical and structural codes meet modern standards. Additionally, filtration can be optimized with few filters. We'll continue to look into the GAC options (whether separate or combined and how hydraulic grade through the WTP may be affected)
- One item for consideration is the existing clearwell and how we may re-use it. Also, while building new, additional clearwell capacity should be considered and hydraulic grades also need to be considered (e.g. – will the hydraulic grade line create a need for a new pumping stage to move water). Many of these decisions are somewhat interlinked in the conversation on CT and also hinge on details such as whether ozone will be included. For cost estimating purposes, I'd recommend we estimate the cost of a new clearwell into the project and then see how we may optimize the size as design approaches.

Sorry for such a long email but I was unsure if we were going to have a project update meeting. Please pass this information along to relevant team members. If necessary, we could have a meeting tomorrow at 1 p.m. covering the information outlined above. I would expect it to be relatively short as we work towards our final report draft submittal.

Let me know any other questions that may arise.

Thanks,
Matt Kusnir

matt kusnir PE
HDR Engineering, Inc.
Water/Wastewater Engineer
2517 Sir Barton Way | Lexington, KY 40509
office: 859.629.4800 | direct: 859.629.4885 | fax: 859.629.4801
matt.kusnir@hdrinc.com | hdrinc.com
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Sep 11, 2013 9:39:03 AM

From: Kusnir, Matt < Matthew.Kusnir@hdrinc.com >
To: "zachery.dukes@amwater.com" < "zachery.dukes@amwater.com" >
Subject: **Filter Building Study - historic preservation**

Zach,

Just a heads up… LFUCG has a historic registry (http://www.lexingtonky.gov/historic) where certain zones are registered as historic and also cases where buildings are registered as histori others by the National Register.

The filter building is NOT in a historic area nor is the building itself a historic landmark. This is good news for any potential renovation or demolition of that building.

Thanks,
Matt

MATT KUSNIR
PE

HDR Engineering, Inc.
Water/Wastewater Engineer

2517 Sir Barton Way | Lexington, KY 40509
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Attachments:

Aug 7, 2013 2:38:35 PM

From: David Shehee/KAWC/AWWSC < David.Shehee@amwater.com >
To: Zachery B. Dukes/KAWC/AWWSC@AWW < Zachery.Dukes@amwater.com >
Subject: **GAC at RRS**

Zach,

One thing I forgot to mention to HDR when we had our meeting was that Jacobson Reservoir has Cyanobacteria in it. These are Blue/Green algae that are often taste and odor causers but also are potentially tc coppering program, they also are removed by GAC and in terms of safety I would consider that a critical need. Can you pass this on as they are considering GAC contactors at RRS? I would think we could ha that isn't too cost prohibitive up front). I am attaching our latest information on the reservoir for your perusal.

Thanks,

David

David B. Shehee
Superintendent, Water Quality and Environmental Compliance
KENTUCKY
AMERICAN WATER
www.kentuckyamwater.com
2300 Richmond Road | Lexington | Kentucky 40502
☎ 859.335.3660 | 859.335.3388 | david.shehee@amwater.com

For quality and value, tap water is the clear choice.

BLUEGRASS
GREENSOURCE

Please consider the environment before printing this email.

Attachments:
Kentucky-American 130717.xls Kentucky-American 130717.pdf

Aug 14, 2013 2:59:44 PM

From: Kusnir, Matt < Matthew.Kusnir@hdrinc.com >
To: "zachery.dukes@amwater.com" < "zachery.dukes@amwater.com" >
Subject: **KAW RRS - information request**

Zach,

I have a couple information request items to follow up on. Listed below are several items that came up during discussion that I don't believe we've received yet. Let me know if any of thes

- SCADA programming (will show us how and under what conditions the WTP is operated)
- Previous GAC study performed by KAWC
- Operational guidance from KAWC on target TOC, turbidity, DBPs, etc.

This information will be important in understanding the entire treatment process and in determining the best filtration technology to recommend. We'd also like to utilize some of the infc

If you have any questions on the info request, feel free to email or call.

Thanks,
Matt

MATT KUSNIR
PE

HDR Engineering, Inc.
Water/Wastewater Engineer

2517 Sir Barton Way | Lexington, KY 40509
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Attachments:

UNDERWATER INSPECTION REPORT

RICHMOND ROAD CLEAR WELL

CONDITION ASSESSMENT
KENTUCKY AMERICAN WATER COMPANY
LEXINGTON, KENTUCKY

INSPECTION DATE: AUGUST 13, 2013
REPORT DATE: SEPTEMBER 17, 2013

Prepared for:

HDR, Inc.
2517 Sir Barton Way
Lexington, KY 40509

Prepared by:

Marine Solutions, Inc.
225 Industry Parkway
Nicholasville, KY 40356

MSI MARINE SOLUTIONS, INC.
ENGINEERING & COMMERCIAL DIVING SERVICES

225 Industry Parkway
Nicholasville, Kentucky 40356
(859) 260-1055
(859) 554-4100 FAX
www.msimarinesolutions.com

September 17, 2013 MSI13-032L02

Mr. Brent Tippey, P.E.
Vice President
HDR Engineering
2517 Sir Barton Way
Lexington, KY 40509-2275

Re: Underwater Inspection Report
Richmond Road Clear Well
Kentucky American Water Company
Lexington, Kentucky

Dear: Mr. Tippey,

Please find enclosed the underwater inspection report for the condition assessment of the Kentucky American Water Company Richmond Road Clear Well located in Lexington, Kentucky. The inspection was performed on August 13, 2013. We appreciate the opportunity to assist with this project.

Respectfully Submitted,

MARINE SOLUTIONS, INC.

John J. Loftus, P.E.
Senior Project Engineer

Sean P. Chapman, P.E.
Project Manager

Table of Contents

Section **Page No.**

List of Appendixes

1. INTRODUCTION

Marine Solutions, Inc. (MSI) conducted an underwater inspection of the Kentucky American Water Company Richmond Road Clear Well in support of a condition assessment and options evaluation for continued and increased use. The inspection was performed on August 13, 2013. The underwater inspection was performed as part of an overall evaluation of the Richmond Road Filter Building. The areas subject to inspection included the east, center, west, and north bays of the interior areas of the clear well both below and above water at the time of the inspection. The purpose of the inspection and this report is to document the conditions, confirm structural configurations, identify possible structural deficiencies and provide recommendations for assessment of the discovered conditions.

The following provides a description of the inspection procedures used, observed conditions, conclusions and recommendations. Photographs of the conditions are included as Attachment A. Sketches illustrating the location of identified conditions are included as Attachment B. A log identifying the photos and videos taken are included in Attachment C.

1.1. Inspection Procedures

An inspection was performed on the interior of the clear well. At the time of the inspection, the clear well water level was at an elevation of 990.8 feet. The water surface elevation was obtained by measurements from elevations shown on 1953 record building plans. At the time of the inspection, a majority of the clear well structure was submerged, the upper portions of the clear well walls, underside of the operating/filter floor and floor beams were above water during the inspections. A tactile and visual inspection was performed throughout the entire interior of the clear well and sediment was removed from select areas for closer examination. Videos and photos were taken to document the typical conditions and structural deficiencies.

In order to identify locations of found conditions, the four bays of the clear well were labeled as the “East Bay”, “Center Bay”, “West Bay”, and the “North Bay” (see illustration in Appendix B). Floor beams in each bay were number from the north to the south on the East, Center, and West Bays and from east. Floor beams in the North Bay were numbered from the east to the west. Walls were labeled in each bay according to direction (north, south, east or west). The underside of the operating/ filter floor was referred to as the clear well ceiling during the inspection. All defects were located using the above labeling system. The general configuration of the clear well is illustrated on the drawing provided in Attachment B.

2. OBSERVED CONDITIONS

The following provides a list of the observations made and conditions noted. Photographs are included in Attachment A. An illustration of the clear well with noted conditions is provided in Attachment B.

2.1. General Observations

The following general conditions were observed during the inspection.

- The general configuration of the clear well was verified during the inspection using the 1924 and 1953 facility plans.
- The concrete surfaces below water typically were covered with a light layer of brown/red sediment up to 1/16 inch thick.
- The concrete walls and floors in all of the bays and the ceiling and floor beams in the Center Bay were covered with an epoxy coating. The coating was generally in fair condition, covering approximately 75 percent of the concrete surfaces. Isolated areas of the coating appeared to be thin or worn away at random isolated areas.
- The exposed areas of the concrete floor exhibited light scaling up to 1/4 inch deep.
- Pipes penetrating the ceiling typically exhibited heavy corrosion with up to 1/2 inch thick of rust scaling. However, the pipes appeared secure and no holes through the steel casings of the pipes were observed.
- Areas of pipe penetrations typically exhibited spalling around the edges of the pipe with up to 4 inches of penetration and exposed reinforcing steel with up to 100 percent section loss. The spalls appeared to be the result of rough cut-outs for the pipe penetrations.

2.2. Clear Well Observations

The following specific conditions were observed during the inspection.

2.2.1. West Bay:

- The concrete floor beams (filter level floor beams) exhibited random hairline cracks and exposed steel appearing to be reinforcement stirrups or form chairs spaced approximately every 8 feet. The exposed steel appears to be exposed due to insufficient form separation and concrete cover occurring when the beams were cast. The exposed bars have heavy corrosion with up to 50 percent section loss. Cracking, spalls or other forms of deterioration was not observed on the beams.
- The concrete ceiling (underside of the filter level floor) exhibited random hairline cracks. At isolated locations exposed steel from form ties or reinforcement chairs exists, generally spaced approximately every 1 foot transversely across the floor slab.
- A transverse crack with efflorescence was observed on the ceiling, measuring 10 feet long and 1/16 inch to 1/8 inch wide between floor beams 7 and 8. The crack extended from the east wall of the bay to 10 feet to the west.

- A transverse crack with efflorescence was observed on the ceiling, measuring 6 feet long and 1/16 inch wide between floor beams 11 and 12. The crack extended from the east wall of the bay to 6 feet to the west.
- A transverse crack with efflorescence was observed on the ceiling, measuring 5 feet long and 1/16 inch wide between floor beams 11 and 12. The crack was centered 4 feet east of the west wall.
- A transverse crack with efflorescence was observed on the ceiling, measuring 8 feet long and 1/16 inch wide between floor beams 17 and 18. The crack extended from the east wall of the bay to 8 feet to the west.
- A spall was observed on the south wall of the bay, 6 feet from the east wall and 2 feet below the ceiling, measuring 1 foot in diameter and 2 inches of penetration with 1 steel reinforcement bar exposed with up to 75 percent section loss.
- A spall was observed on the south wall of the bay, 6 feet from the east wall and 4 feet below the ceiling, measuring 18 inches high, 4 inches wide, and 3 inches of penetration with 1 reinforcement bar exposed with up to 50 percent section loss.
- A spall was observed on the south wall of the bay, 6 feet from the east wall and 5 feet below the ceiling, measuring 6 inches in diameter and 2 inches of penetration with no reinforcement bars exposed.

2.2.2. Center Bay:

- The concrete floor beams typically exhibited random hairline cracks. Exposed steel was not observed on the underside of the beams. Cracking, spalls or other forms of deterioration was not observed.
- The concrete ceiling typically exhibited random hairline cracks and exposed steel form ties or chairs spaced approximately every 6 inches, transversely across the slab at isolated locations.
- A transverse crack with efflorescence was observed on the ceiling measuring 15 feet long and 1/16 inch wide between floor beams 5 and 6. The crack extended from the west wall to the east wall.
- A spall was observed on the ceiling between floor beams 5 and 6, 4 feet from the east wall at an existing pipe penetration, measuring 1 foot long, 8 inches wide, and 2 inches of penetration with no reinforcement bars exposed.
- A transverse crack with efflorescence was observed on the ceiling measuring 15 feet long and 1/8 inch wide between floor beams 8 and 9. The crack extended from the west wall to the east wall.
- Two bands of honeycombing due to poor concrete consolidation were observed on the concrete column below the number 16 floor beam on the west wall at 2 location 5 feet

and 6 feet below the water surface. The areas measure 4 feet long, 6 inches wide, and 1 inch of penetration.

- A band of honeycombing due to poor concrete consolidation was observed on the concrete column below the number 12 floor beam on the west wall 5 feet below the water surface. The area measures 4 feet long, 6 inches wide, and 1 inch of penetration.

2.2.3. East Bay:

- The concrete floor beams exhibited random hairline cracks and exposed steel appearing to be reinforcement stirrups or form chairs spaced approximately every 8 feet. The exposed steel exhibited heavy corrosion with up to 50 percent section loss. Cracking, spalls or other forms of deterioration was not observed.
- The concrete ceiling exhibited random hairline crack and exposed steel form ties or reinforcement chairs spaced approximately every 1 foot transversely across the slab at isolated locations.
- A transverse crack with efflorescence was observed on the ceiling measuring 19 feet long and 1/8 inch to 1/4 inch wide between floor beams 14 and 15. The crack extended from the west wall to the east wall.
- A transverse crack with efflorescence was observed on the ceiling measuring 5 feet long and 1/16 inch wide between floor beams 19 and 20. The crack extended from the east wall of the bay to 5 feet toward the west.
- A spall was observed on the ceiling between floor beams 15 and 16, at an existing pipe penetration. The spalled area measured 1 foot long, 1 foot wide, and 4 inches of penetration with 2 bars exposed with 100 percent section loss.
- A void with flowing water was observed between floor beams 20 and 21, on the west wall 1 foot below the ceiling, measuring 4 inches wide and 2.5 inches tall.
- A spall was observed on the south wall of the bay, 6 feet from the east wall and 2 feet below the ceiling, measuring 1 foot high, 18 inches wide, and 2 inches of penetration with 1 bar exposed with up to 75 percent section loss.
- A diagonal crack was observed on the west wall column below floor beam 19, from the bottom of the window extending upward, measuring 6 feet long, 1/8 inch wide, and penetrating through the thickness of the wall.

2.2.4. North Bay:

- The concrete floor beams exhibited random hairline cracks. Cracking, spalls or other forms of deterioration was not observed.

- The concrete ceiling exhibited random hairline cracks and exposed steel form ties spaced approximately every 6 inches. The exposed form ties exhibited heavy corrosion with up to 50 percent section loss.

3. CONCLUSIONS AND RECOMMENDATIONS

Overall the clear well was found to be in good condition. Defects or damage that would affect the integrity or stability of the reinforced concrete walls, columns, floor or the above filter level floor were not observed. Repairs are recommended to limit future deterioration and extend the operational life of the well.

The void with leaking water found within the East Bay should be investigated from the operations floor level and repaired if warranted. The operations floor above the center bay of the well is situated at a lower elevation than the adjacent filter floors located to the east and west. The void could have been intentional to allow water to drain from the filter/operations floor above the center bay of the clear well.

The spalls and areas of exposed steel within the clear well are not structural concerns at this time; however, they should be repaired to limit further deterioration and cover exposed and corroding steel areas. The areas should be repaired by partial depth concrete replacement methods designed to be placed and remain in the wet well environment. However, prior to making any concrete repairs around pipes which penetrate the ceiling of the clear well, the remaining service life of the pipes should be considered. At the time of the inspection the outer portions of the pipes exhibited heavy corrosion which may make replacement warranted. If it is determined that the pipes are to be replaced, concrete repairs should be made following the replacement.

The concrete cracks within the clear well provide a means for water infiltration, evident from the heavy efflorescence. It is therefore recommended that these cracks be repaired to prevent further leakage into the clear well and to limit corrosion of the concrete slab's steel reinforcement and crack propagation. The cracks should be repaired by crack injection methods, including filling and sealing the cracks. The cracking appears likely to translate through the floor slab. As such, the cracks should be repaired and sealed from both above and below the filter level floors.

The honeycombing due to poor concrete consolidation observed in the Center Bay is likely an as-constructed condition and does not appear to be actively deteriorating. Therefore, no repairs are recommended for these areas.

- END OF REPORT -

Attachment A

Photographs

Photo – 1	West Bay. Transverse crack on the ceiling between floor beams 7 and 8.

Photo – 2	West Bay. Transverse crack on the west side of the ceiling between floor beams 11 and 12.

Photo - 3	West Bay. Transverse crack on the east side of the ceiling between floor beams 11 and 12.

Photo - 4	West Bay. Transverse crack on the ceiling between floor beams 17 and 18.

Photo - 5	West Bay. Three spalls on the south wall, 6 feet west of the east wall.

Photo - 6	Center Bay. Typical condition of floor beams.

Photo - 7	Center Bay. Typical condition of the ceiling. Note the apparent exposed reinforcement chairs.

Photo - 8	Center Bay. Typical 10 inch diameter pipe penetration through the ceiling.

Photo - 9	Center Bay. Typical 8 inch diameter pipe penetration through the ceiling.

Photo - 10	Center Bay. South wall with 24" pipe and 12 in diameter U-pipe penetration through ceiling.

Photo - 11	Center Bay. Typical 12 inch diameter U-pipe penetration through ceiling.

Photo - 12	Center Bay. Transverse crack on the ceiling between floor beams 5 and 6.

Photo - 13	Center Bay. Transverse crack on the ceiling between floor beams 8 and 9.

Photo - 14	Center Bay. Spall on the ceiling floor beams 5 and 6, 4 feet west of the east wall.

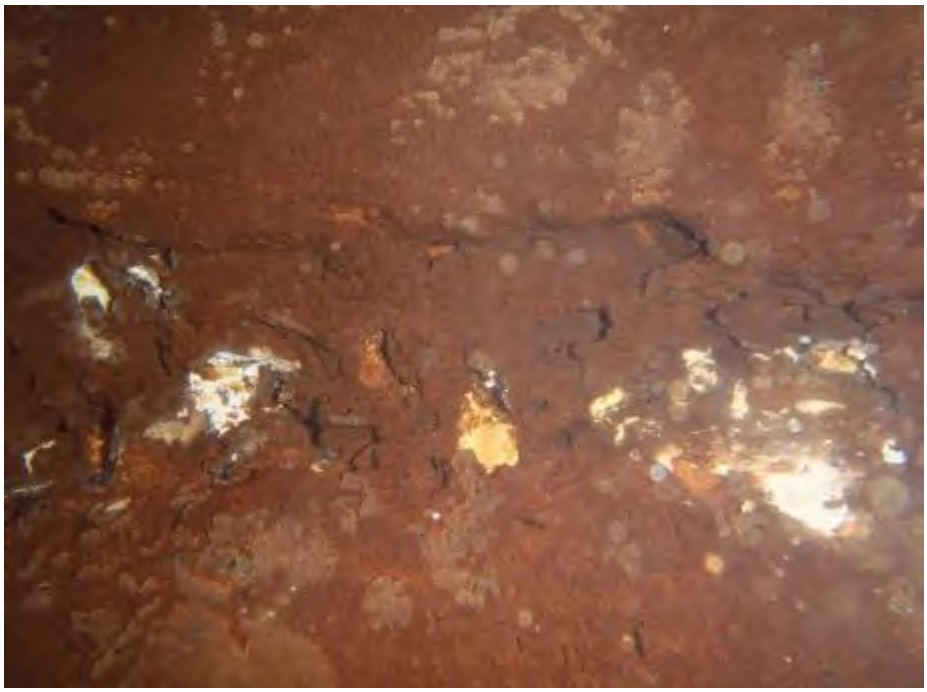


Photo - 15	Center Bay. Poor concrete consolidation on the west wall below floor beam 16.

Photo - 16	East Bay. Typical condition of floor beam. Note the exposed stirrup.

Photo - 17	East Bay. Typical condition of the ceiling. Note the exposed form ties.

Photo - 18	East Bay. Typical 12 inch diameter pipe penetration through the ceiling.

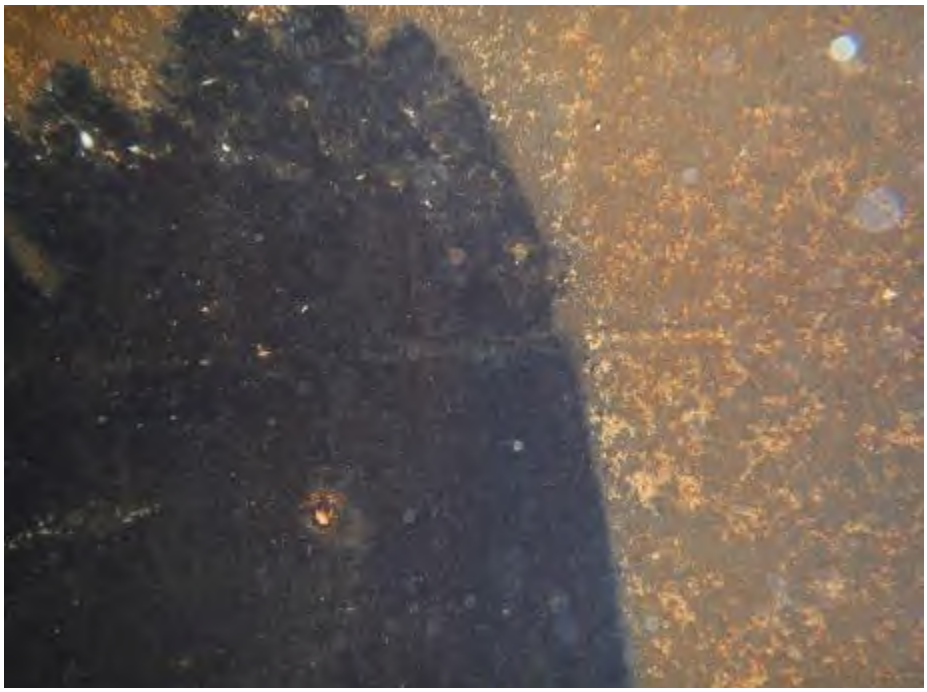


Photo - 19	East Bay. Underwater photo showing the typical condition of the coated wall with sediment partially wiped away.

Photo - 20	East Bay. Underwater photograph showing the typical condition of the floor in an area where the coating has been removed.

Photo - 21	East Bay. Transverse crack on the ceiling between floor beams 9 and 10.

Photo - 22	East Bay. Transverse crack on the ceiling between floor beams 14 and 15.

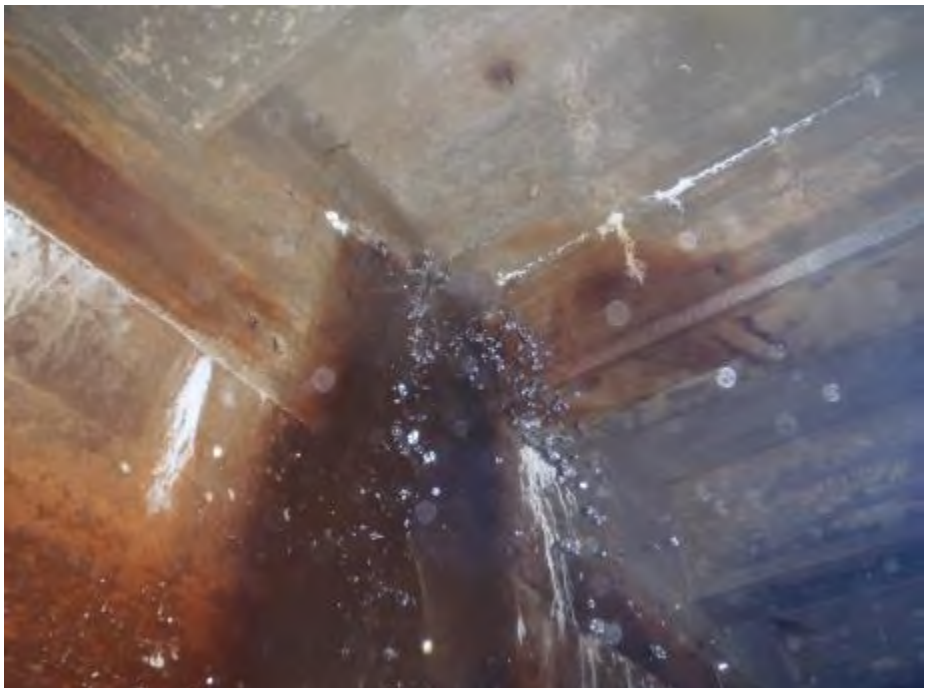


Photo - 23	East Bay. Void on the west wall between floor beams 20 and 21. Note the water coming through the void.

Photo - 24	East Bay. Spall on the south wall 6 feet west of the east wall.

Photo - 25	East Bay. Underwater photo of the diagonal crack on the west wall at floor beam 19.

Photo - 26	North Bay. Typical condition of floor beams.

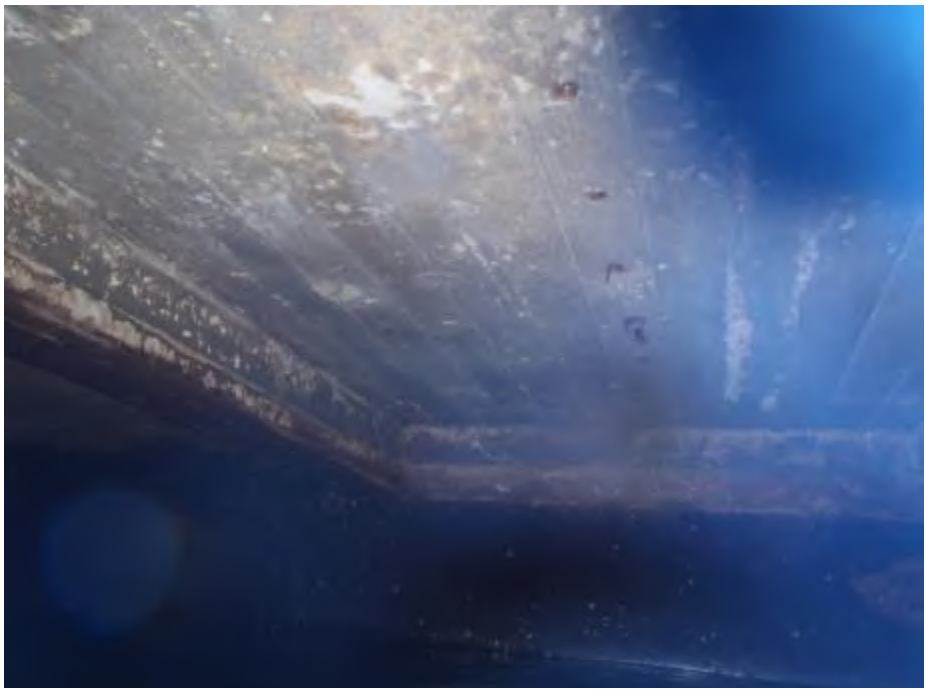
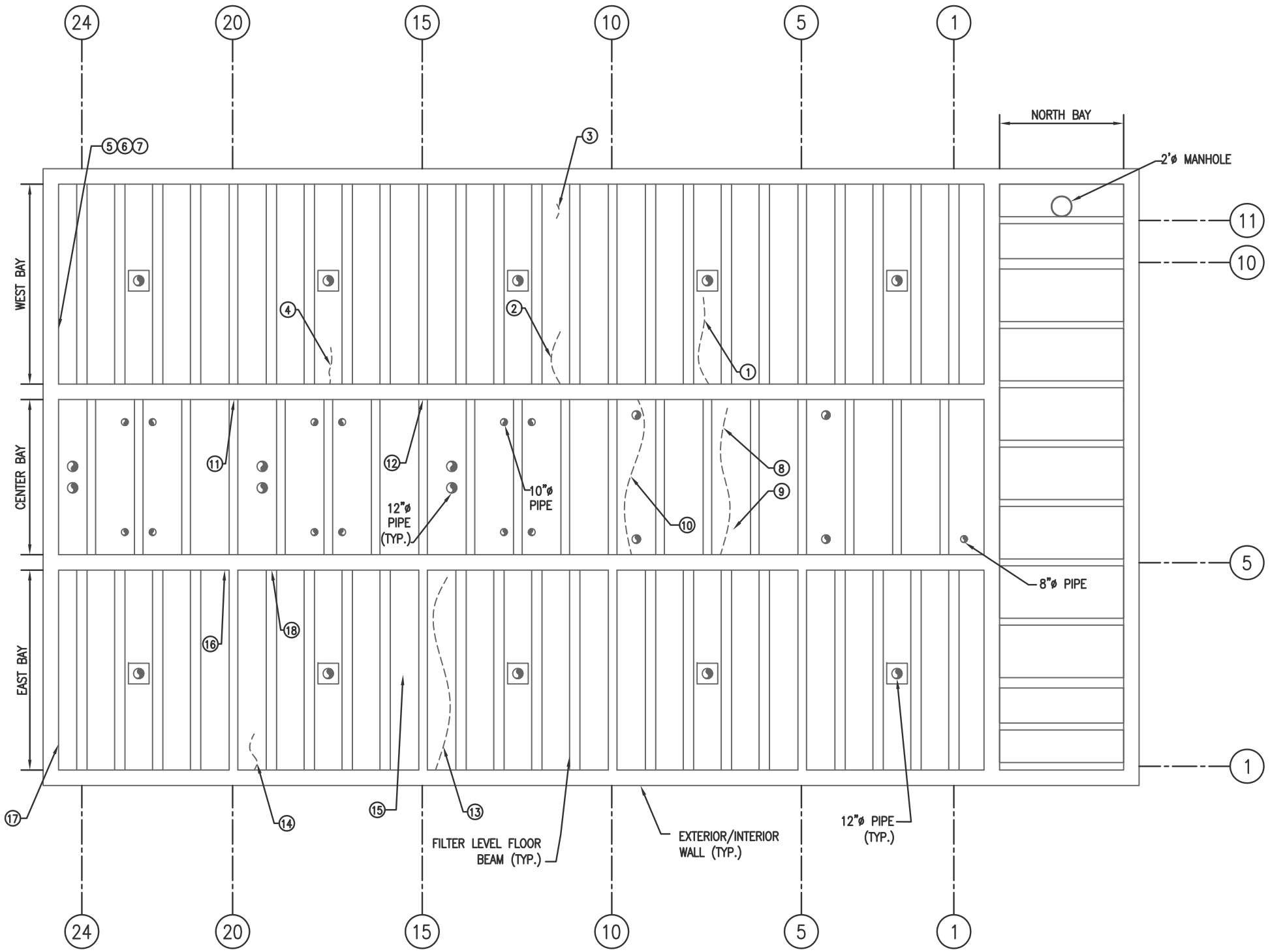


Photo - 27	North Bay. Typical condition of the ceiling. Note the exposed form ties.

Attachment B

Figures



PLAN–CLEAR WELL INTERIOR

LEGEND

(1) BEAM NUMBER DESIGNATION

① CONDITION NOTE

PIPE PENETRATION INTO CLEAR WELL

--- CRACK

NOTES:

1. THIS DRAWING IS INTENDED TO ILLUSTRATE THE GENERAL LOCATION OF OBSERVED CONDITIONS ONLY. ACTUAL STRUCTURAL CONFIGURATIONS MAY VARY.

2. THE LOCATIONS OF FOUND CONDITIONS WERE IDENTIFIED BY AREAS OF THE CLEAR WELL LABELED "EAST BAY", "WEST BAY", "CENTER BAY", AND "NORTH BAY" AND BY FILTER LEVEL FLOOR BEAMS NUMBERED FROM NORTH TO SOUTH AND EAST TO WEST AS SHOWN.

CONDITION NOTES:

1. A TRANSVERSE CRACK WITH EFFLORESCENCE WAS OBSERVED ON THE CEILING MEASURING 10 FEET LONG AND 1/16 INCH TO 1/8 INCH WIDE BETWEEN FLOOR BEAMS 7 AND 8. THE CRACK EXTENDED FROM THE EAST WALL OF THE BAY 10 FEET WEST.
2. A TRANSVERSE CRACK WITH EFFLORESCENCE WAS OBSERVED ON THE CEILING MEASURING 6 FEET LONG AND 1/16 INCH WIDE BETWEEN FLOOR BEAMS 11 AND 12. THE CRACK EXTENDED FROM THE EAST WALL OF THE BAY 6 FEET WEST.
3. A TRANSVERSE CRACK WITH EFFLORESCENCE WAS OBSERVED ON THE CEILING MEASURING 5 FEET LONG AND 1/16 INCH WIDE BETWEEN FLOOR BEAMS 11 AND 12. THE CRACK WAS CENTERED 4 FEET EAST OF THE WEST WALL.
4. A TRANSVERSE CRACK WITH EFFLORESCENCE WAS OBSERVED ON THE CEILING MEASURING 8 FEET LONG AND 1/16 INCH WIDE BETWEEN FLOOR BEAMS 17 AND 18. THE CRACK EXTENDED FROM THE EAST WALL OF THE BAY 8 FEET WEST.
5. A SPALL WAS OBSERVED ON THE SOUTH WALL OF THE BAY, 6 FEET FROM THE EAST WALL AND 2 FEET BELOW THE CEILING, MEASURING 1 FOOT IN DIAMETER AND 2 INCHES OF PENETRATION WITH 1 BAR EXPOSED WITH UP TO 75 PERCENT SECTION LOSS.
6. A SPALL WAS OBSERVED ON THE SOUTH WALL OF THE BAY, 6 FEET FROM THE EAST WALL AND 4 FEET BELOW THE CEILING, MEASURING 18 INCHES HIGH, 4 INCHES WIDE, AND 3 INCHES OF PENETRATION WITH 1 BAR EXPOSED WITH UP TO 50 PERCENT SECTION LOSS.
7. A SPALL WAS OBSERVED ON THE SOUTH WALL OF THE BAY, 6 FEET FROM THE EAST WALL AND 5 FEET BELOW THE CEILING, MEASURING 6 INCHES IN DIAMETER AND 2 INCHES OF PENETRATION WITH NO BARS EXPOSED
8. A TRANSVERSE CRACK WITH EFFLORESCENCE WAS OBSERVED ON THE CEILING MEASURING 15 FEET LONG AND 1/16 INCH WIDE BETWEEN FLOOR BEAMS 5 AND 6. THE CRACK EXTENDED FROM THE WEST WALL TO THE EAST WALL.
9. A SPALL WAS OBSERVED ON THE CEILING BETWEEN FLOOR BEAMS 5 AND 6, 4 FEET FROM THE EAST WALL AT AN EXISTING PIPE PENETRATION, MEASURING 1 FOOT LONG, 8 INCHES WIDE, AND 2 INCHES OF PENETRATION WITH NO BARS EXPOSED.
10. A TRANSVERSE CRACK WITH EFFLORESCENCE WAS OBSERVED ON THE CEILING MEASURING 15 FEET LONG AND 1/8 INCH WIDE BETWEEN FLOOR BEAMS 8 AND 9. THE CRACK EXTENDED FROM THE WEST WALL TO THE EAST WALL.
11. TWO BANDS OF POOR CONCRETE CONSOLIDATION WERE OBSERVED ON THE CONCRETE COLUMN BELOW THE NUMBER 16 FLOOR BEAM ON THE WEST WALL AT 2 LOCATIONS 5 FEET AND 6 FEET BELOW THE WATER SURFACE. THE AREAS MEASURE 4 FEET LONG, 6 INCHES WIDE, AND 1 INCH OF PENETRATION.
12. A BAND OF POOR CONCRETE CONSOLIDATION WAS OBSERVED ON THE CONCRETE COLUMN BELOW THE NUMBER 12 FLOOR BEAM ON THE WEST WALL 5 FEET BELOW THE WATER SURFACE, MEASURE 4 FEET LONG, 6 INCHES WIDE, AND 1 INCH OF PENETRATION.
13. A TRANSVERSE CRACK WITH EFFLORESCENCE WAS OBSERVED ON THE CEILING MEASURING 19 FEET LONG AND 1/8 INCH TO 1/4 INCH WIDE BETWEEN FLOOR BEAMS 14 AND 15. THE CRACK EXTENDED FROM THE WEST WALL TO THE EAST WALL.
14. A TRANSVERSE CRACK WITH EFFLORESCENCE WAS OBSERVED ON THE CEILING MEASURING 5 FEET LONG AND 1/16 INCH WIDE BETWEEN FLOOR BEAMS 19 AND 20. THE CRACK EXTENDED FROM THE EAST WALL OF THE BAY 5 FEET WEST.
15. A SPALL WAS OBSERVED ON THE CEILING BETWEEN FLOOR BEAMS 15 AND 16, AT AN EXISTING PIPE PENETRATION, MEASURING 1 FOOT LONG, 1 FOOT WIDE, AND 4 INCHES OF PENETRATION WITH 2 BARS EXPOSED WITH 100 PERCENT SECTION LOSS.
16. A VOID WITH FLOWING WATER WAS OBSERVED BETWEEN FLOOR BEAMS 20 AND 21, ON THE WEST WALL 1 FOOT BELOW THE CEILING, MEASURING 4 INCHES WIDE AND 2.5 INCHES TALL.
17. A SPALL WAS OBSERVED ON THE SOUTH WALL OF THE BAY, 6 FEET FROM THE EAST WALL AND 2 FEET BELOW THE CEILING, MEASURING 1 FOOT HIGH, 18 INCHES WIDE, AND 2 INCHES OF PENETRATION WITH 1 BAR EXPOSED WITH UP TO 75 PERCENT SECTION LOSS.
18. A DIAGONAL CRACK WAS OBSERVED ON THE WEST WALL COLUMN BELOW FLOOR BEAM 19, FROM THE BOTTOM OF THE WINDOW EXTENDING UPWARD, MEASURING 6 FEET LONG, 1/8 INCH WIDE, AND PENETRATING THROUGH THE THICKNESS OF THE WALL.

MSI MARINE SOLUTIONS, INC.
ENGINEERING & COMMERCIAL DIVING SERVICES

INSPECTION DATE: AUGUST 13, 2013

NOT TO SCALE

KENTUCKY AMERICAN WATER COMPANY
CLEAR WELL
CONDITION ASSESSMENT

INTERIOR CLEAR WELL CONDITION PLAN

FIG. NO. **B-1**

Kentucky American Water Company – Richmond Road Station

Filter Building Options Summary

1- Option 1 includes a new rapid rate granular media filtration building. The filters consist of 18" anthracite followed by 12" of sand and a supporting IMS cap. Due to the new construction, existing operational impact would be minimal. The entire filter building could remain in service while a new building was being built. After the new filter building goes online, the existing filter building could be fully renovated into an administrative area with offices, restrooms, etc. Some areas, such as the pipe gallery, could be demolished then abandoned. To save money, the entire building does not need to be converted. The downside to only a new filter building is the reduced water quality. The GAC caps could be installed on top of filter, however this is undesirable as it takes a current problem and passes it on to future operations. No future considerations (i.e. – stricter regulations) are accounted for with this option.

2- Option 2 includes a new rapid rate granular media filtration building and new GAC building. The filters consist of 18" anthracite followed by 12" of sand and a supporting IMS cap. Due to the new construction, existing operational impact would be minimal. The entire filter building could remain in service while a new building was being built. After the new filter building goes online, the existing filter building could be fully renovated into an administrative area with offices, restrooms, etc. Some areas, such as the pipe gallery, could be demolished then abandoned. To save money, the entire building does not need to be converted. The GAC building is estimated around a 10 minute EBCT, more than doubling the current EBCT through the existing caps. This option will provide superior water quality and provide additional comfort in protection from stricter future regulations. Two new buildings does consume much more existing space on the current site.

PHOTO AND VIDEO LOG

UNDERWATER INSPECTION
RICHMOND ROAD CLEAR WELL
KENTUCKY AMERICAN WATER COMPANY
LEXINGTON, KY
DATE: August 13, 2013

Video	Photo	Location	Description
001	NA	East Bay. North end and west wall/window.	Typical condition.
002	24-27	East Bay. North end above water.	Typical floor beams and underside of the floor.
003	28, 29	East Bay. Ceiling between floor beams 3 and 4.	Typical 12 inch pipe penetration.
004	22, 23	East Bay. Ceiling between floor beams 9 and 10.	Transverese crack on ceiling.
005	20, 21	East Bay. Ceiling between beams 14 and 15.	Transverese crack on ceiling.
006	NA	East Bay. West wall between floor beams 15 and 16.	Spall on wall.
007	17-19	East Bay. West wall between floor beams 20 and 21.	Void on wall.
008	13-16	East Bay. South wall.	Spall on wall.
009	04-12	East Bay. South wall and floor.	Typical condition.
010	NA	Center Bay. South end and west wall/window.	Typical condition.
011	01-03	East Bay. West wall at floor beam 19.	Diagonal crack on wall.
012	32-34	East Bay. North end and pump.	Typical condition of pump pipe, floor beams, ceiling.
013	30, 31	Center Bay. Ceiling between floor beams 5 and 6.	Transverese crack on ceiling.
014	39-41	Center Bay. Ceiling at floor beam 10.	Typical 8 inch pipe penetrations.
015	44-46	Center Bay. South wall.	Pipe penetrations.
016	NA	Center Bay. Transverse wall below floor beam 16.	Typical condition.
017	47-49	Center Bay. West wall below floor beam 16.	Poor concrete consolidation on wall.
018	NA	North Bay. West end below water.	Typical Conidtion.
019	50	West Bay. Ceiling between floor beams 7 and 8.	Transverese crack on ceiling.
020	53	West Bay. Ceiling between floor beams 17 and 18.	Transverese crack on ceiling.
021	54-56	West Bay. South wall 6 feet west of the east wall.	Three spalls on the wall.

PHOTO AND VIDEO LOG

UNDERWATER INSPECTION
RICHMOND ROAD CLEAR WELL
KENTUCKY AMERICAN WATER COMPANY
LEXINGTON, KY
DATE: August 13, 2013

Video	Photo	Location	Description
022	NA	North Bay.	Typical condition.
023	57-59	North Bay.	Typical condition.
NA	35, 36	Center Bay. Ceiling between floor beams 7 and 8.	Typical 10 inch pipe pentration.
NA	37	Center Bay. Ceiling between floor beams 5 and 6.	Spall on ceiling.
NA	38	Center Bay. Ceiling between floor beams 8 and 9.	Transverese crack on ceiling.
NA	42, 43	Center Bay. Ceiling between floor beams 11 and 12.	Typical 12 inch U-pipe penetration.
NA	51	West Bay. Ceiling between floor beams 11 and 12, west side.	Transverese crack on ceiling.
NA	52	West Bay. Ceiling between floor beams 11 and 12, east side.	Transverese crack on ceiling.

Aug 7, 2013 10:03:35 AM

From: Kusnir, Matt < Matthew.Kusnir@hdrinc.com >
To: "Zachery.Dukes@amwater.com" < "Zachery.Dukes@amwater.com" >
Subject: **RE: Drawings - RRS**

Zach,

I've copied the drawings off the ftp site along with the water quality information. I'm still sifting through it all but I've been able to access it.

Thank you,
Matt Kusnir

-----Original Message-----
From: Zachery.Dukes@amwater.com [mailto:Zachery.Dukes@amwater.com]
Sent: Wednesday, August 07, 2013 9:32 AM
To: Kusnir, Matt
Subject: Fw: Drawings - RRS

Matt,
Please confirm you received these.

Zach

Zachery B. Dukes, P.E.
Project Manager Engineer
Kentucky American Water
2300 Richmond Road
Lexington, KY 40502

Office (859) 268-6352
Cell (859) 537-0750
zachery.dukes@amwater.com
www.amwater.com
----- Forwarded by Zachery B. Dukes/KAWC/AWWSC on 08/07/2013 09:30 AM -----

Attachments:

Aug 9, 2013 3:13:44 PM

From: Quail, Steven < Steven.Quail@hdrinc.com >
To: "Jerry.Garland@amwater.com" < "Jerry.Garland@amwater.com" >
Subject: **RE: Expiration of Certificate of Insurance for American Water - HDR Eng SAP 114812**

Jerry,

Attached is an updated certificate.

Steve

STEVEN J. QUAIL
P.E., BCEE

HDR Engineering, Inc.
Senior Project Manager

6300 S. Old Village Place, Suite 100 | Sioux Falls, SD 57108-2102
605.977.7768 | c: 605.214.4681
steven.quail@hdrinc.com | hdrinc.com
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From: Jerry.Garland@amwater.com [mailto:Jerry.Garland@amwater.com]
Sent: Friday, August 09, 2013 10:08 AM
To: Quail, Steven; Garcia, Gayle; Berggren, Eric
Cc: Zachery.Dukes@amwater.com; Paul.Ferla@amwater.com; aw.procurement@amwater.com; Joseph.Ahlvin@amwater.com
Subject: Expiration of Certificate of Insurance for American Water - HDR Eng SAP 114812
Importance: High

Steven,

Your certificate of Insurance (attached) has expired. Per the Terms and Conditions of your contracts HDR is required to timely submit updates. Please return a current Certificate of Insuran

Regards,

Jerry Garland

Attachments:
3224_001.pdf.pdf

Aug 20, 2013 3:43:18 PM

From: Michael D Maggard/KAWC/AWWSC < Michael.Maggard@amwater.com >
To: Zachery B. Dukes/KAWC/AWWSC@AWW < Zachery.Dukes@amwater.com >
Subject: **Re: Fw: KAW RRS - information request**

Attached are the control strategies for RRS. Let me know if anything else is needed.

Mike Maggard
Sr. Specialist Maintenance Service
Kentucky American Water
2300 Richmond Rd.
Lexington, Ky. 40502
office (859) 268-6348
cell (859)321-3674
e-mail michael.maggard@amwater.com

Zachery B. Dukes---08/14/2013 03:22:52 PM---Mike, can you provide information for the first bullet point below? David, can you provide informati

From: Zachery B. Dukes/KAWC/AWWSC
To: Michael D Maggard/KAWC/AWWSC@AWW, David Shehee/KAWC/AWWSC@AWW
Cc: Kevin Kruchinski <r.kevin.kruchinski@amwater.com>, Justin D Sensabaugh/KAWC/AWWSC@AWW
Date: 08/14/2013 03:22 PM
Subject: Fw: KAW RRS - information request

Mike, can you provide information for the first bullet point below?

David, can you provide information for the second and third bullet points below?

Sorry for the short notice but these are fairly time sensitive so I would like to have them by the end of the week.

Thanks,
Zach

Attachments:
RRS Control Strategies.pdf

Aug 6, 2013 9:17:24 AM

From: Justin D Sensabaugh/KAWC/AWWSC < Justin.Sensabaugh@amwater.com >
To: R Kevin Kruchinski/KAWC/AWWSC@AWW < R.Kruchinski@amwater.com >
Subject: **Re: Fw: RRS Clearwell Structural Condition Assessment**

I need a calendar invite when confirmed.

****
Justin D. Sensabaugh
Operations Supervisor - Production
Kentucky American Water
2300 Richmond Road
Lexington, KY 40502
Office (859) 268-6342
Internal 7-533-6342
Cell (859) 455-6743
Fax (859) 335-3342
justin.sensabaugh@amwater.com

Ronald K Kruchinski---08/06/2013 09:13:03 AM---Zach- I've heard back from everybody on the team so it looks like its a go.

From: Ronald K Kruchinski/KAWC/AWWSC
To: Zachery B. Dukes/KAWC/AWWSC@AWW
Cc: Justin D Sensabaugh/KAWC/AWWSC
Date: 08/06/2013 09:13 AM
Subject: Re: Fw: RRS Clearwell Structural Condition Assessment

---

Zach-

I've heard back from everybody on the team so it looks like its a go.

Justin-

You are the lead man on this. Please handle everything with the plants? Tanks full, reminder day before, etc.

****
Attachments:

Aug 9, 2013 10:38:08 AM

From: Jerry Garland/ILAWC/AWWSC < Jerry.Garland@amwater.com >
To: Zachery B. Dukes/KAWC/AWWSC@AWW < Zachery.Dukes@amwater.com >
Subject: **Re: Fw: RRS Filter Building - EAS**

Zack here it is

  

You'll need an updated certificate of insurance.

Regards,

Jerry Garland
Senior Capital Buyer
Illinois American Water
100 N. Water Works Dr.
Belleville, IL 62223
PH 618-239-3285
Internal 7-431-3285
CL 618-343-5874
Email: jerry.garland@amwater.com

Zachery B. Dukes---08/09/2013 09:21:26 AM---Jerry, Will you be able to have this to me this am?

From: Zachery B. Dukes/KAWC/AWWSC
To: Jerry Garland/ILAWC/AWWSC@AWW
Date: 08/09/2013 09:21 AM
Subject: Fw: RRS Filter Building - EAS

Jerry,
Will you be able to have this to me this am?

Zachery B. Dukes, P.E.
Project Manager Engineer
Kentucky American Water
2300 Richmond Road
Lexington, KY 40502

Attachments:
RFP - ESL Study - FINAL.docx HDR Insurance Certificate.pdf ESL Scope of Services_Final_11Mar13.docx HDR IAWC ESLI Plan Limited Professional Services Contract.docx

Aug 6, 2013 8:32:45 AM

From: Tippey, Brent < Brent.Tippey@hdrinc.com >
To: "zachery.dukes@amwater.com" < "zachery.dukes@amwater.com" > "Kevin Kruchinski (r.kevin.kruchinski@amwater.com)" < "Kevin Kruchinski (r.kevin.kruchinski@am
Subject: **RRS Clearwell Structural Condition Assessment**

Hi Zack/Kevin,

Hope things are well.

We would like to propose Tuesday Aug 13th for the clearwell condition assessment. Marine would mobilize at 9AM and be inside the clearwell from approximately 10 AM -2 PM.

Let me know if this works…

Brent

BRENT A. TIPPEY, P.E.

HDR Engineering
Vice President | Water Business Group Leader

2517 Sir Barton Way | Lexington, KY 40509
859.223.3755 office | 859.629.4831 direct | 859.221.5555 cell
Brent.Tippey@hdrinc.com | hdrinc.com

Attachments:

Sep 10, 2013 7:50:51 AM

From: Tippey, Brent < Brent.Tippey@hdrinc.com >
To: "zachery.dukes@amwater.com" < "zachery.dukes@amwater.com" >
Subject: **RRS Contract**

Hey Zach,

Had a quick one that I should have caught. Our office manager was filing the contract for the RRS study and noticed that it did not have an Appendix A which provides the definition of the see if we just didn't get that part of the contract.

If it was omitted , perhaps we could add a very short description of work and our fee. I think that would make it whole.

Really sorry for the hassle – I should have caught this earlier.

Any help appreciated.

Brent

BRENT A. TIPPEY, P.E.

HDR Engineering
Vice President | Water Business Group Leader

2517 Sir Barton Way | Lexington, KY 40509
859.223.3755 office | 859.629.4831 direct | 859.221.5555 cell
Brent.Tippey@hdrinc.com | hdrinc.com

Attachments: