

5 May 2008

Request For Information

To: Mr. James X. Kelly, P.E., Utilities Manager
City of Arlington

From: Chris Kelsey

Subject: Information Needs To Facilitate 90 Percent Design
Wastewater Treatment Plant (WWTP)
Upgrade and Expansion Final Design

RFI No. 4: Information Needs to Facilitate 90 Percent Design

KJ Project No. 0597002*02

Requested Response Date: As Indicated For Individual Items
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During, and subsequent to, the 60% design period, many design issues have been presented and discussed between the K/J design team and City of Arlington (COA) public works staff. These identified issues necessitate the need for ongoing input from COA on the preferred direction for a number of design elements. Receiving direction on the items within this Request for Information (RFI #4) will serve towards finalizing the WWTP design criteria, and will allow our design team to continue progressing on the current project schedule.

The following list (with desired dates for receipt of information) is requested from COA:

1. **Existing Site Drainage.** Please review and respond to the 17 April 2008 e-mail sent by K/J regarding clarification of the existing WWTP site drainage. As requested in that e-mail, please verify what storm drain lines are connected to the river outfall and whether or not the City wants any of those storm drains re-routed for onsite containment (e.g., re-routed to the tank drain pump station). **Requested Response:** On or before *Friday, 9 May 2008*.
2. **WAS Pumps.** Please provide nameplate information for the existing WAS pumps. If the pump curves are also available, please provide that information as well. If the pump curves are not available, K/J should be able to obtain them using the nameplate information. **Requested Response:** On or before *Friday, 9 May 2008*.
3. **Shop Sink.** Does the City want a sink in the shop section of the Equipment Building? If so, should it be supplied with hot water? **Requested Response:** On or before *Friday, 9 May 2008*.
4. **Existing Tie Beams.** The 60% design assumed that the existing tie beams in the SBR basins would be removed, cut to length, and reinstalled to attach to the new longitudinal walls. The structural engineer says that the beams could be left in place, tabs welded to the beams to tie into rebar in the new walls, and the new walls cast around the beams. This would provide a small cost savings. The only disadvantage with this approach is that the top of the tie beams are not flush with the top of the basin and would stick up three inches along the intermediate walkways above the new walls. This could be a potential tripping hazard. This could be somewhat mitigated by welding steel plates on that would ramp up and down from the beams to help provide a transition. Please

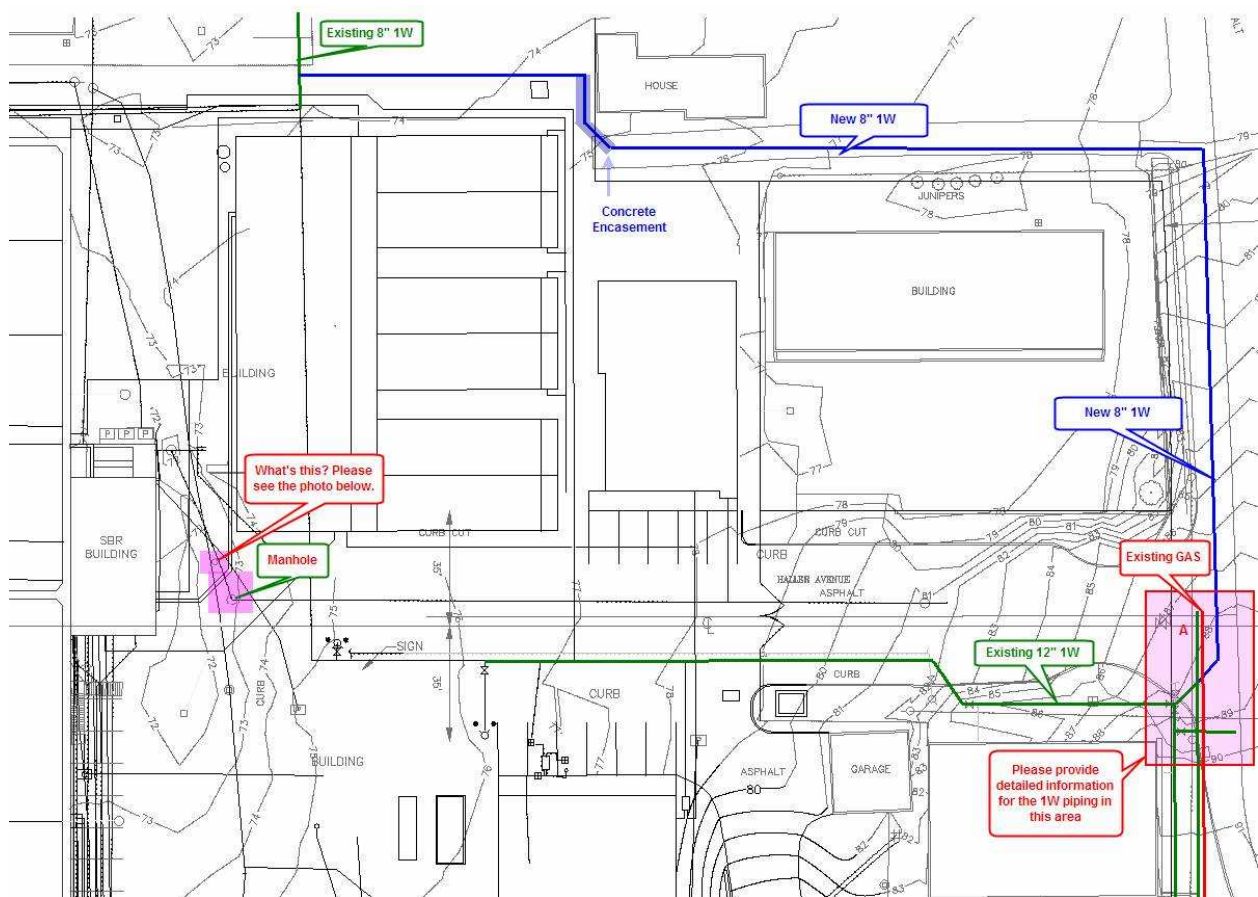
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provide feedback on whether the City is OK with leaving the tie beams in place. (As an additional note, the baffle walls across the basins that were discussed as being pre-cast sections during the 60% design review meeting have now been changed to cast-in-place, due to the higher cost that would have become necessary with reinforcing the cast sections together for full structural bearing capacity.) **Requested Response:** On or before *Friday, 9 May 2008*.

- Existing 1W Piping.** During the 60% design review meeting, it was noted that the alignment of the relocated 1W pipe did not meet the separation requirements. Therefore, we have come up with an alternative alignment (see Figure 1 below).

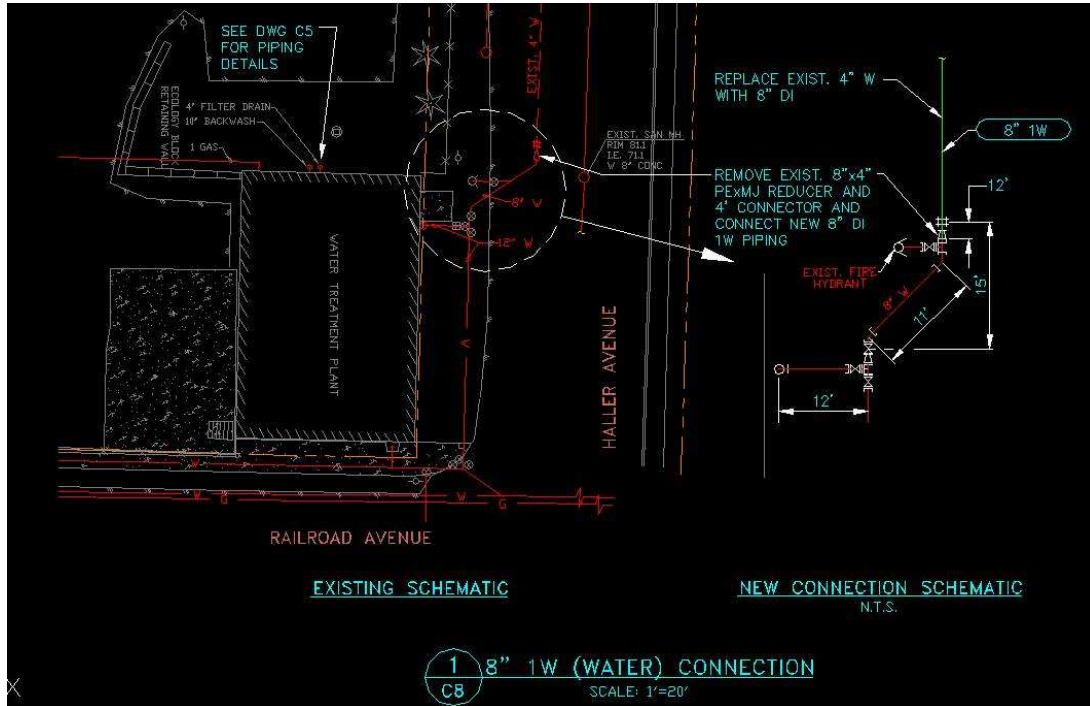


Utilizing the public right of way in the alley north of the apartments, the alternative alignment achieves the separation requirements, except for a short distance at a pinch point near the northeast corner of the MBR tanks. In this location, we will concrete encase the pipe for the short distance that it is less than 10' clear of the RAS piping. We need additional information on the existing 1W piping in the vicinity of the old water treatment plant to complete the design of this revised alignment. Drawing C10 from the previous upgrade (see Figure 2 at the top of the next page) shows some information, but we need information on the continuation of the 1W line that heads north.

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- 6. **Unknown Site Feature.** Figure 3 below shows an unknown feature. It is suspected this could be a monitoring well. Please identify this feature.



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7. **Dewatered Sludge Handling.** Prior to the 60% submittal, the City had asked K/J to evaluate the cost of either depressing the slab in the Solids Handling Building truck bay to contain dewatered sludge, or installing a distribution sludge conveyor to distribute sludge over the length of a truck bed. K/J estimated the cost of lowering the slab to be approximately \$40k and the cost of installing a distribution sludge conveyor to be about \$50k. However, the cost of lowering the slab did not include costs for relocating equipment in the truck bay (e.g., electrical panels) that would need to be moved if sludge were to be dumped on the floor of the truck bay. The City indicated a preference for a distribution sludge conveyor. Please confirm. **Requested Response:** On or before *Friday, 9 May 2008*.

8. **SBR Basin Slab.** The existing slab in SBR #2 is sloped to the southeast corner. This will result in more volume in Aeration Basin #3 and less in Aeration Basin #1. The differential is about 7,000 gallons. Not a substantial amount, but not insignificant. Since the bottom 6" slab is going to be removed anyway, there are three options: 1) Leave the floor elevations as they are. This represents no additional cost beyond what we've already estimated. The disadvantage is the volume differential of 7,000 gallons will remain. 2) The elevation in the southeast corner could be raised 6" and the elevation in the southwest corner lowered 6" so the elevation was constant across the south wall (with the floor still being sloped north to south). This will provide equal volume in each aeration basin. The disadvantage is an added cost of approximately \$28k for additional demolition work and concrete replacement. 3) We would also lower the slab 6" at the south end to gain about 15,000 gallons of total process volume. However, this would require that the floor remained sloped both north to south and east to west to connect with the footing, meaning the volumes in the individual aeration basins would not be balanced (there would still be the 7,000 gallon offset). Also, this option would add approximately \$30k to the cost. Our recommendation would be the second option to provide equal volume in all the aeration basins. Please let us know if you agree with this recommendation or would like us to design based on one of the other options. **Requested Response:** On or before *Friday, 9 May 2008*.

9. **Anoxic Recycle and Nitrate Recycle Propeller Pumps.** Currently, it is assumed that the anoxic and nitrate recycle pumps will be connected to adjustable frequency drives (AFDs) and the discharge from these pumps will be metered. All process model runs have used a 100% anoxic recycle and 300% nitrate recycle. The pumps are sized for the 100% and 300% recycle at 4 MGD. The AFDs would allow the recycle rate to be reduced for flows lower than 4 MGD to maintain the same recycle ratios (100% and 300%). Alternatively, the AFDs could be excluded, such that the pumps would run at a constant speed. This would result in greater than 100% and 300% recycle rates much of the time. This would result in some additional power consumption (though not a substantial amount since the motor sizes are only 2.5 and 9.4 horsepower for the anoxic and nitrate recycle pumps, respectively) and it appears that effluent phosphorus could increase by 10% (increase of about 0.04 mg/l). The benefits would be lower capital cost with the exclusion of the AFDs and flow meters. The flow meters could be replaced with a flow switch to set an alarm if the flow dropped below a setpoint, indicating a problem with the pump or pipeline blockage. Please let us know whether or not you would like to keep the AFDs and flow meters for the submersible anoxic and nitrate recycle pumps, or consider the option described for a capital cost reduction of approximately \$120,000 and

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an increased yearly power cost of approximately \$5,000-\$6,000. The largest component of the capital cost reduction is due to the elimination of the flow meters, which have been assumed to be of stainless steel materials for the submersible application. **Requested Response:** On or before *Friday, 9 May 2008*.

10. **Bulk Water Purchasing Hose Bib.** There is currently a bulk water purchasing hose bib north of the existing lab that is fenced and labeled with a sign. This will need to be removed for construction of the Equipment Building. Is this bulk water purchasing hose bib still used? If so, where does the City want this hose bib and sign relocated? If relocated, it is assumed that it will need to be fenced with a man gate, as is currently the case. **Requested Response:** On or before *Friday, 9 May 2008*.
11. **Utility Plant Site Boundaries.** During the 60% design review meeting, the City indicated that the property line on Haller Avenue should be shifted to the east, such that it runs continuously with the western property line of the existing apartment building, effectively shortening the length of Haller Avenue. Additionally, the City expressed a belief that the asphalt paved access road on the west side of the SBR basins was within the Utility Plant property, which was not indicated by our survey. Please furnish a redlined copy of Existing Site Plan Sheet C1 that depicts the proper property boundaries. **Requested Response:** On or before *Friday, 9 May 2008*.
12. **Planning Requirements.** K/J provided a code review document to the City following the 60% submittal. Please review the planning requirements and provide feedback on our assumptions. **Requested Response:** On or before *Friday, 16 May 2008*.
13. **Gas Service.** The City indicated they plan to bring gas service to the site. Gas service will be extended to the Lab/Office Building. Please confirm whether or not gas service will be extended to any of the other buildings and whether or not the existing electric space heaters in the existing Support Building are to be replaced with gas space heaters. **Requested Response:** On or before *Friday, 16 May 2008*.
14. **Dewatering Equipment Pre-Selection.** The City indicated a potential desire to pre-select the dewatering equipment manufacturer in order to optimize design and establish required space for the solids handling building expansion. K/J has requested data from Prime Solution comparing performance of a 24-inch and 36-inch diameter unit to help the evaluate a possible pre-selection. **Requested Response:** On or before *Friday, 16 May 2008, or after receipt of data*.
15. **Influent Sanitary Sewer.** The City indicated that the influent sewer upstream of the headworks has been revised. Please provide information on the revisions. **Requested Response:** On or before *Friday, 16 May 2008*.
16. **Noise Requirement.** During the 60% design review meeting, the City expressed concern about noise from the biofilter fans. The City indicated they would look into what noise level would be allowable, which included the suggestion to limit decibel levels at the property boundaries to 45 dB(a). Due to the cost associated with sound attenuation necessary for equipment under power outage or emergency conditions, we recommend that any required noise levels be limited to "normal" facility operations. Please provide

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the allowable noise level for the fans. **Requested Response:** On or before *Friday, 16 May 2008*.

17. **Standby Power Generator Fuel Storage.** During the 60% design review meeting, there was discussion about fuel storage capacity. It was agreed that unless requirements dictated otherwise, 24-hours of fuel storage would be provided. Ecology's Orange Book and EPA's document on reliability classifications do not specify minimum fuel storage requirements. NFPA 110 requires 48 to 96 hours of fuel storage for Level 1 facilities, but wastewater facilities are classified as Level 2 and have no specific requirements. Therefore, we typically recommend 24-hours of fuel storage. Currently, this storage provision would translate to a required fuel tank size of 2400 gallons to enable normal operations of the full facility under Phase 2 flows. Our code review indicated that there are no restrictions for this tank capacity under an outdoor application. Please confirm that you agree with the conclusion to size the fuel storage for 24-hours, and that the City's fire marshal does not have any concerns for the size of the diesel storage tank that might not have been addressed in the code review. **Requested Response:** On or before *Friday, 16 May 2008*.
18. **Laboratory Equipment Needs.** During the 60% design review meeting, there was discussion of what laboratory equipment would need to be furnished by the Contractor. Per a previous e-mail from the City dated 1 February 2008, the City indicated they wanted the Contractor to supply a new fume hood, autoclave, and DI water system. The City has since procured a new DI water system. During the review meeting, the City indicated they would also like a lab grade dishwasher. Please confirm whether or not any equipment besides the dishwasher, autoclave, and fume hood is to be provided by the contractor (e.g., balance table, oven, vacuum pump, etc.). **Requested Response:** On or before *Friday, 16 May 2008*.
19. **Laboratory Equipment Dimensions.** Please provide dimensions on large equipment (e.g., refrigerator/freezer, balance table, etc.) that is to be relocated to the new laboratory. **Requested Response:** On or before *Friday, 16 May 2008*.
20. **Pipe Materials.** During the 60% design review meeting there was discussion on pipe materials. The previous upgrade used PVC and galvanized steel (thermoplastic coated) for buried water piping and copper and galvanized steel for exposed water piping. K/J typically used soft copper for buried and hard copper for exposed. The City indicated that buried 1W, 2W, and 3W piping should be HDPE. The City also indicated that exposed 1W, 2W, and 3W piping should be PVC. The City indicated they did not want to use copper piping. HDPE pipe is only available in sizes down to 2 inches. For smaller sizes in buried applications, should PVC be used? Also, for sizes greater than or equal to 4 inches, does the City want to use ductile iron or HDPE for buried water pipelines? Please confirm these pipe materials. Also, please provide information on any specific material requirement for plumbing drain piping. **Requested Response:** On or before *Friday, 16 May 2008*.
21. **Contractor Staging Area.** During the 60% design review meeting, there was discussion about potentially using a portion of Haller Park, to the north and adjacent to the existing Utilities Administration Building, as a staging area for the Contractor. This

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would potentially supplement the area where the privy was discovered directly east of the Utilities Administration Building, which will be utilized for staging. The City indicated they would look into this possibility, as well as determine if further staging areas in proximity to the Utility Plant (such as on the Butler property) could be made available. Please provide feedback on potential additional areas that might be utilized for contractor staging. **Requested Response:** On or before *Friday, 16 May 2008*.

22. **Digested Sludge Pumps Spare.** The existing digested sludge pumps are limited in their operating speed to prevent water column separation. At the maximum allowable speed, the pumps have a maximum capacity of approximately 90 gpm, which is sufficient for Phase 1, based on 100 hours per week of operation. For Phase II, the second pump will also need to be operated in parallel to achieve the necessary capacity. Additionally, if the City wishes to operate the dewatering process less frequently during Phase I, both pumps will be required. Does the City want a shelf spare pump provided for Phase I to supplement the two installed pumps, or only at Phase II when simultaneous operation of two pumps may become more routine? **Requested Response:** On or before *Friday, 16 May 2008*.
23. **Digested Sludge Pump Rehabilitation.** K/J plans to specify that the Contractor pay for Penn Valley to rehabilitate the existing digested sludge pumps. Penn Valley offers a rehabilitation for about \$4,000 per pump, or \$8,000 for replacement of the main pump section. The advantage of the replacement is that they will provide the newest pump section that allows maintenance in place, without having to remove the pump. Please indicate City preference. **Requested Response:** On or before *Friday, 16 May 2008*.
24. **WAS Pump Rehabilitation.** K/J plans to specify the Contractor rehabilitate the Gorman Rupp WAS pumps. The motor will be replaced with an inverter duty motor. In addition, please indicate what other rehabilitation tasks the City specifically like to have done (e.g., replace seals, bearings, etc.)? **Requested Response:** On or before *Friday, 16 May 2008*.
25. **Solids Handling Building Heating.** Earlier, K/J identified that heating the Belt Filter Press room of the existing Solids Handling Building could not be done without either insulating the walls, obtaining a waiver allowing this area to be classified as a semi-heated space (since the energy requirement would exceed that allowed for a semi-heated space), or shutting down odor control for this space during the cold weather months. Please provide direction on how the City plans to proceed and if a waiver can be obtained. **Requested Response:** On or before *Friday, 16 May 2008*.

Please call us with any questions or problems at (253) 874-0555. We appreciate the continued responsiveness of the City.