APPENDIX F

Reclaimed Water System Alternatives

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Meeting Notes – August 2, 2006

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As part of the Pima County Regional Optimization Master Plan program, a subcommittee of Tucson Water and PCWMD staff was formed to consider the integration of reclaimed water into the alternative analysis of the regional system configurations. The subcommittee met on August 2, 2006 to discuss a range of reclaimed water issues and address the 13 reclaimed water alternatives developed in Workshop #2 – Reuse/Flow Transfer. Attendees of the meeting were:

Tucson Water	PCWMD	Greeley and Hansen
Melodee Loyer	Steve Munsell	Jerry Bish
Sandy Elder	Ron Riska	
Tim Thomure		
Dean Trammel		

A summary of the meeting discussions and comments are provided below.

1. As a result of the meeting, there were three universally agreed upon position statements by the subcommittee:

   - Tucson Water will continue to operate the Sweetwater recharge/recovery facilities and wetlands indefinitely. The recharge/recovery facilities are required to meet peak reclaimed water demands now and in the future.
   - The 20-mgd capacity at Roger Road WWTP is one scenario being evaluated by Pima County Wastewater Management Department. Tucson Water has plans to work with the County on whatever option the County adopts regarding flow split between the two facilities.
   - Tucson Water plans to make use of its ten acres at the Ina Road WPCF for reclaimed water facilities, as provided for in the 1979 IGA.

2. For future (2030) reclaimed water needs in Pima County, Tucson Water would ideally like to have its allocated average daily flow share of the effluent (at Class A+ quality) split between two locations with 30mgd, plus or minus, at Roger Road WWTP and 20 mgd, plus or minus, at Ina Road WPCF. In addition, up to 3 mgd of reclaimed water would be available from Randolph Park WRF.

   The above effluent allocation does not include possible additional flows for Metro Water, Oro Valley Water, Pima County, SAWRSA or any other entity who may be interested in wheeling water through the reclaimed system.

   30 mgd at Roger Road WWTP will serve the Sweetwater recharge/recovery facilities with a future capacity of up to 20,000 AF/yr, Sweetwater wetlands, booster pump station that feeds the reclaimed

water distribution system, and groundwater augmentation at some future date. At times, under certain operational conditions, some of the 30 mgd could be released to the Santa Cruz River.

20 mgd at Ina Road WPCF (at Class A+ quality) would serve a booster pump station that feeds the reclaimed water distribution system. At times and under certain conditions, some or all of that 20 mgd could be released to the Santa Cruz River.

3. Recharge and recovery facilities at Sweetwater are currently rated at 6,500 AF/yr and are being expanded to 10,000 AF/yr. The ultimate build out of the recharge and recovery facilities at Sweetwater would increase the capacity to 20,000 AF/yr. The build out would occur in steps or stages as demands require.

4. Tucson Water plans to construct a reclaimed water pump station and reservoir at the Ina Road WPCF site. The earliest date for startup after construction would be five years. The facility would likely be about 20 mgd, depended on customer demands.

   If the facilities are constructed prior to the construction of the wastewater upgrades to NdeN facilities at Ina Road WPCF (as stated above), then at a minimum filtration will be required until the new NdeN facilities are constructed (approximately four years). If possible, Tucson Water would like to use the discharge from the BNRAS facility at Ina Road WPCF because of the better water quality. This may not be possible because of the plant discharge permit requirements (blended effluent).

5. Sweetwater wetlands will remain at Roger Road. When the effluent from Roger Road WWTP is upgraded to Class A+, the filtration plant at the Roger Road Reclaimed Water Facility will be decommissioned and the filter backwash will be discontinued. To sustain the wetlands, Class A+ effluent from Roger Road WWTP or perhaps backwash from the filters at the Roger Road WWTP would be utilized. This will require additional review after the system configuration and unit processes are determined for Roger Road WWTP.

6. At some future date, effluent may be treated to drinking water standards for purposes of groundwater augmentation. The facilities to treat the effluent will likely be located at the Roger Road facility on City or County property. Planning will need to include space for the potential of this future facility.

7. Tucson Water has evaluated the reclaimed water system needs for the 2030 condition under each of the regional system configuration options (using Class A+ quality only) – **existing plan, transfer some and transfer all**. In addition, they evaluated a transfer none option. These scenarios would be altered significantly if effluent is not Class A+ quality.

   Current features of the reclaimed water system configuration are shown on the attached Present Conditions schematic. Salient features required for each system configuration option are described below. A schematic of each system configuration option is attached.

- ***Existing Plan (Roger Road WWTP (RR) 32 mgd; Ina Road WPCF (IR) 50 mgd):***
  System configuration option requires additional effluent pumping at Roger Road WWTP and construction of effluent pumping (20 + mgd capacity), disinfection, storage reservoir and booster pumping at Ina Road WPCF. Flow to the Santa Cruz River at Roger Road WWTP will need to be addressed in order to determine facility size at Ina Road, as well as adequacy of 24-inch line to transfer needed flows. (See attached schematic: X-fer Some RR = 32-mgd.)
- ***Transfer Some (RR 20 mgd; IR 62 mgd):***
  System configuration option requires construction of effluent pumping (30 + mgd capacity), disinfection, storage reservoir and booster pumping station at Ina Road WPCF and a reclaimed water transfer main between Roger Road and Ina Road (up to 10 mgd could flow through an existing reclaimed water distribution main but an additional flow of up to 7 mgd or more may have to be transferred for discharge to the Santa Cruz River). (See attached schematic: X-fer More RR = 20 mgd.)
- ***Transfer All (RR 0 mgd; IR 82 mgd):***
  System configuration option requires construction of effluent pumping, disinfection, storage reservoir and booster pumping station at Ina Road WPCF and a reclaimed water transfer main between Roger Road and Ina Road. Pumping capacity will be at least 50 + mgd and transfer main capacity at 30 mgd (plus additional flow to be discharged at Roger Road WWTP into the Santa Cruz River). (See attached schematic: X-fer All.)
- ***Transfer None (RR 60 mgd; IR 22 mgd):***
  System configuration option requires additional effluent pumping at Roger Road WWTP and construction of effluent pumping (20 + mgd capacity), disinfection, storage reservoir and booster pumping at Ina Road WPCF. Discharge from Roger Road WWTP will be available to the Santa Cruz River. (See attached schematic: X-fer None.)

8. Subcommittee comments on the 13 reclaimed water alternatives developed in Workshop # 2 – Reuse/ Flow Transfer are provided in items 8.1 through 8.13 below. The description of the alternative is provided with the subcommittee comments following in italicized type.

   8.1. Base case – Roger Road WWTP remains in operation at 32 mgd with the Sweetwater Recharge/Recovery Facilities.

   a. Reclaimed water system centered at Roger Road WWTP with recharge basins (underground storage) in service.
   This alternative meets the future requirements for reclaimed water flow at Roger Road as long as there is no minimum discharge required to the Santa Cruz, but does not meet the 20-mgd requirement at Ina Road. This is not a suitable alternative.

   b. Reclaimed water system centered at Roger Road WWTP with recharge basins (underground storage) in service and additional new supply provided from Ina Road WPCF
   Meets the Tucson Water's reclaimed water requirements for pumping capacity and storage. Minimal infrastructure required to implement.

   c. Reclaimed water system centered at Roger Road WWTP, reclaimed basins decommissioned and additional new supply provided from Ina Road WPCF.

Without underground storage, Tucson Water will be unable to meet peak summer demands. This is not a suitable alternative.

8.2. Roger Road WWTP size is reduced to optimize utilization of the existing infrastructure for future needs (20 mgd). (Scalping facility or with some discharge to the Santa Cruz River?)

a. Reclaimed water system centered at Roger Road WWTP with recharge basins (underground storage) in service. Some flow released to Santa Cruz River.
Insufficient quantities at Roger Road WWTP to meet future reclaimed water system demands of Tucson Water. This is not a suitable alternative.

b. Reclaimed water system centered at Roger Road WWTP with recharge basins (underground storage) in service and additional new supply provided by Ina Road WPCF. Some flow released to the Santa Cruz River.
Meets Tucson Water's reclaimed water requirements, but requires pumpback of at least 10 mgd from Ina Road WPCF to Roger Road WWTP to meet reuse water demands plus additional flow for the Santa Cruz River.

c. Scalping plant scheme -- reclaimed water system centered at Roger Road WWTP, recharge basins (underground storage) in service. No flow released to the Santa Cruz River from Roger Road WWTP.
Same as 8.2.a above. Insufficient quantities at Roger Road WWTP to meet future reclaimed water system demands of Tucson Water plus Zero discharge to the Santa Cruz River may not be acceptable. This is not a suitable alternative.

8.3. All reclaimed water is produced at Ina Road WPCF. Roger Road WWTP is eliminated and Sweetwater Facilities are eliminated. Tucson Water or the County builds Sweetwater like facilities at or near Ina Road WPCF.

a. Reclaimed water from plant. No underground storage.
Underground storage facilities are required to meet seasonal demands. This is not a suitable alternative.

b. Reclaimed water from plant with underground storage.
Constructing new underground storage for reclaimed water may be possible, but Tucson Water is committed to the proven underground storage facilities at Roger Road WWTP. Building new underground storage facilities for reclaimed water service would be extremely costly and is not feasible in many areas.

8.4. Ina Road WPCF produces reclaimed water and the Sweetwater Recharge and Recovery Facilities remain in operation next to Roger Road WWTP.
Meets Tucson Water's reclaimed water needs, but requires pumpback of at least 30 mgd from Ina Road WPCF to Roger Road WWTP to meet reuse water demands.

8.5. Randolph Park WRF remains at existing 3-mgd capacity.

Tucson Water is supportive of keeping the Randolph Park WRF. This facility provides low flow demands in the reclaimed water system in the winter and is an additional source or reclaimed water, although small.

8.6. Randolph Park WRF expands to a greater capacity than 3 mgd. (This does not appear viable because of the limited service area connected with the plant.)
Expansion of the Randolph WRF is limited by the maximum collection system capacity associated with the plant and the limited site for expansion of the plant. This is a very unlikely alternative.

8.7. Abandon Randolph Park WRF.
This is possible but unlikely for three reasons. 1) The County has a significant new investment in the facilities, 2) the volume provided to Tucson Water would have to be made up somewhere else, and 3) the County risks losing favorable wheeling rate charges associated with their share of the reclaimed water discharged from the facility.

8.8. Satellite wastewater treatment (scalping?) plants in the outlying areas are upgraded to reclaimed water quality and are used by Tucson Water to augment the reclaimed water system.
At this time there is not an overarching plan by Tucson Water for reclaimed water in the outlying areas. Reclaimed water opportunities will be evaluated on a case-by-case basis considering the effluent water rights, economics, environmental impacts and other factors.

8.9. Santa Cruz River recovery is increased by constructed versus managed recharge systems.
This alternative relates to keeping the effluent discharge water in the County. Provided Tucson Water can received its 2030 effluent allocations at Roger Road and Ina Road as stated in item 2 above, this is not a consideration of this study.

8.10. Connect all outlying facilities to either Roger Road WWTP or Ina Road WPCF.
There are advantages and disadvantages to Tucson Water's overall objectives for reclaimed water by connecting outlying facilities to the two metro plants. There does not seem to be a compelling issue from the reclaimed water perspective to connect the outlying facilities. This option may, however, resolve lingering effluent ownership questions.

8.11. Provide an independent Southlands treatment facility with reclaimed water provisions.
The response to this alternative is similar to item 8.8 above. Reclaimed water opportunities will be evaluated on a case-by-case basis considering the effluent water rights, economics, environmental impacts and other factors. It was suggested that the current HAMP model appears to be working in addressing issues regarding reclaimed water and other water/wastewater issues.

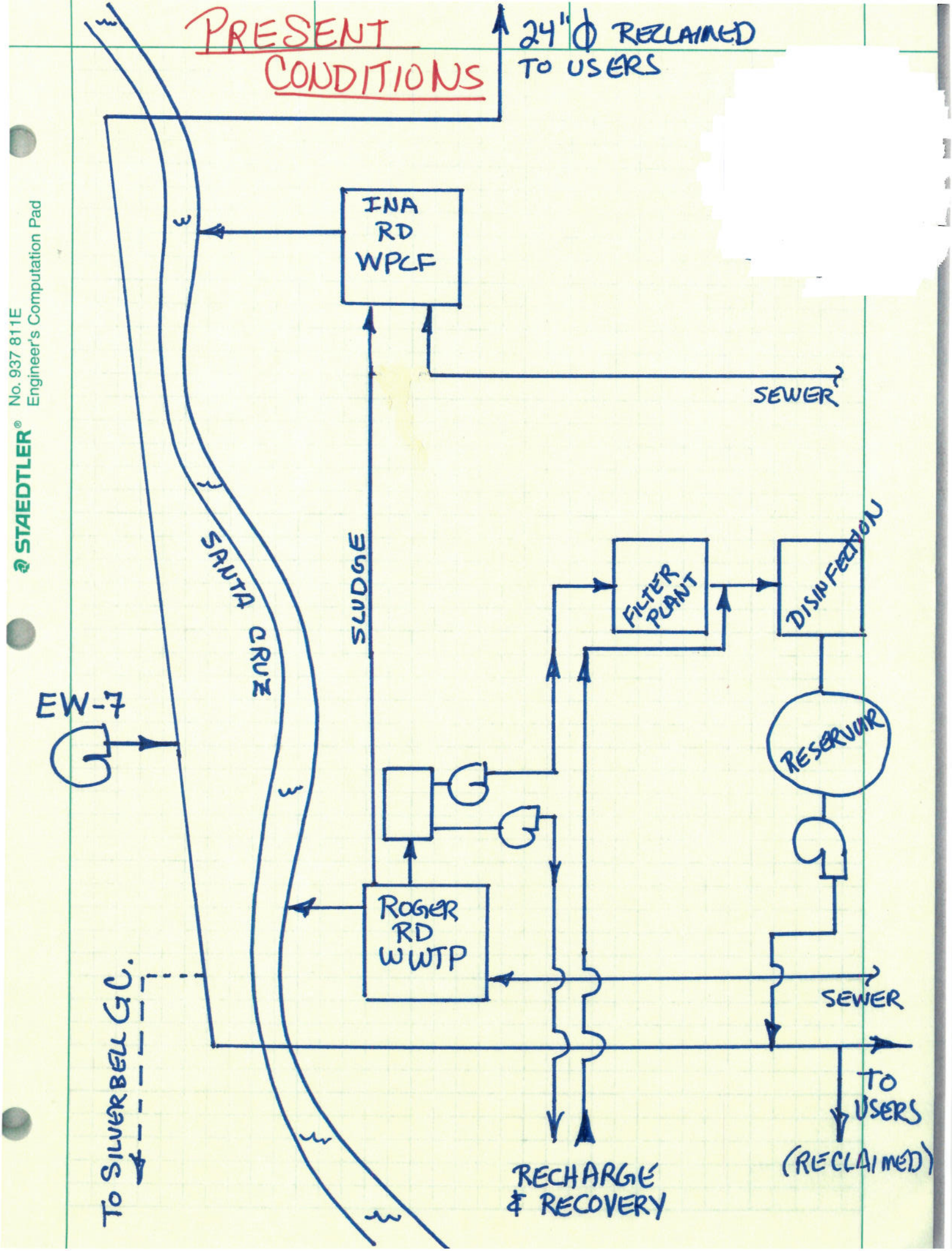
8.12. Expand Roger Road WWTP to provide effluent for Tucson Water use at a higher elevation.
Future use may include transport and treatment to near potable water quality and percolation at Avra Valley recharge facilities. Tucson Water is supportive of this alternative. This capitalizes on

the reclaimed water assessments that Tucson Water has constructed and plans to utilize in the future. This option will also eliminate the need to pump reclaimed water back to Roger Road.

8.13. Provide potable quality reclaimed water for groundwater augmentation.
This is discussed in item 6 above. Space for future facilities will likely need to be provided at Roger Road.

The subcommittee review of the reclaimed water alternatives is summarized below.

- Tucson Water can work with Pima County to make the system configuration options work for their future needs.
- Some alternatives, like the existing plan and expand the capacity of Roger Road WWTP, fit the future of the reclaimed water system better than others (transfer some and transfer all). Features to comply with the various alternatives at Class A+ water quality are provided in Item 7 above.
- In all cases the underground storage and recovery of reclaimed water is required and that facility will be located at Roger Road.
- The existing Randolph Park WRF at 3 mgd should continue operation into the future.
- Reclaimed water operations/utilization basis for the outlying facilities will be decided on a case-by-case basis. The current HAMP cooperative approach appears to be an appropriate model.



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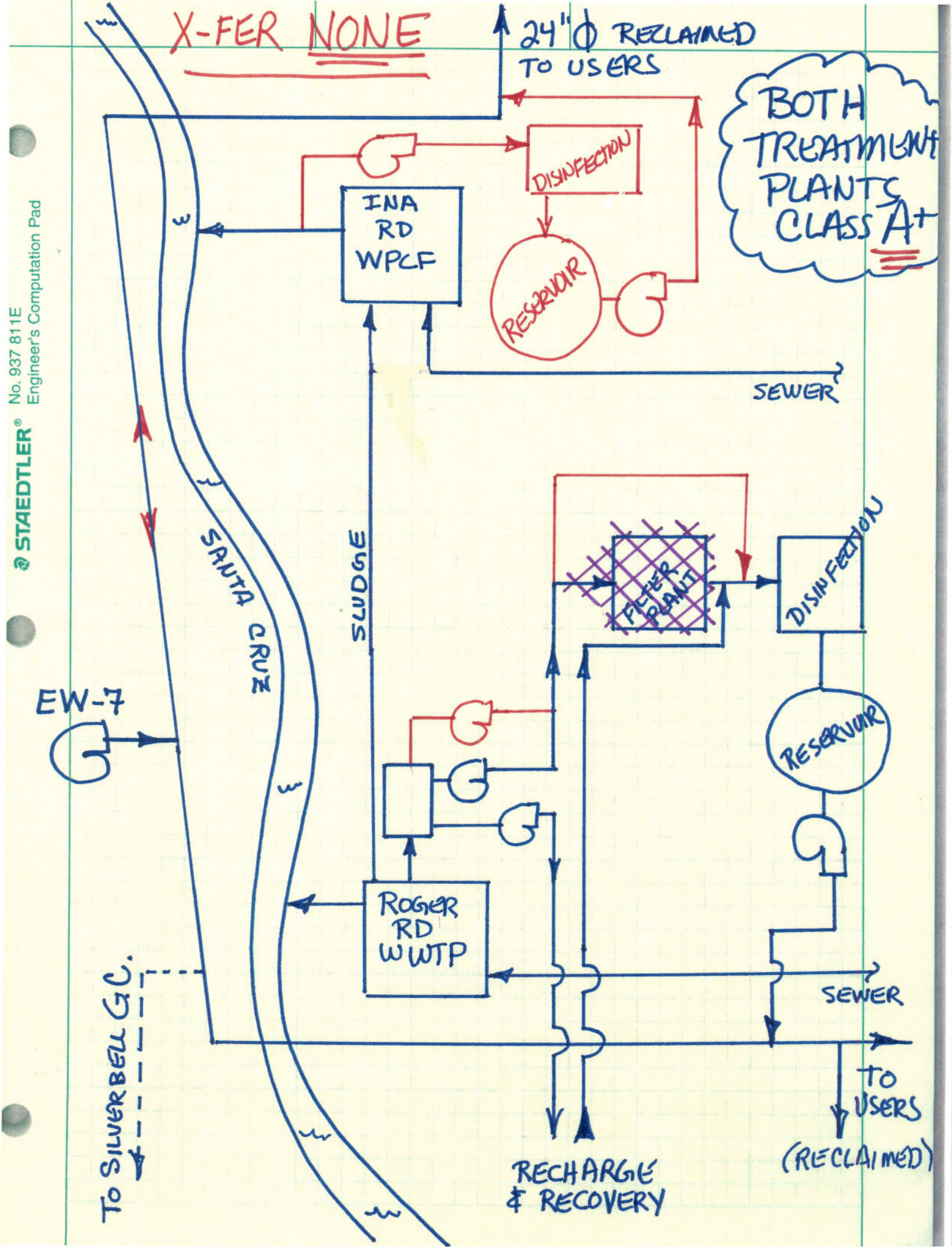

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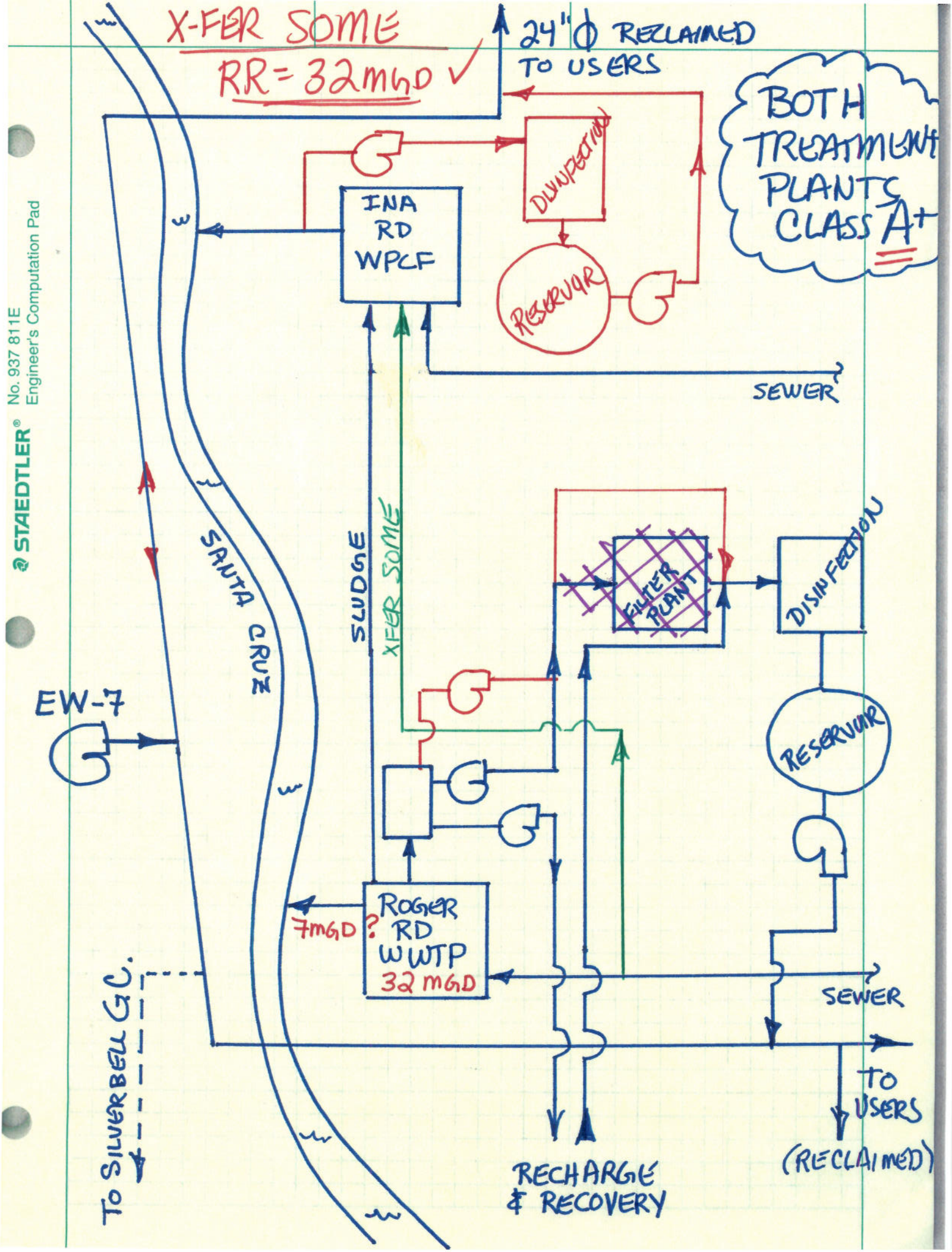

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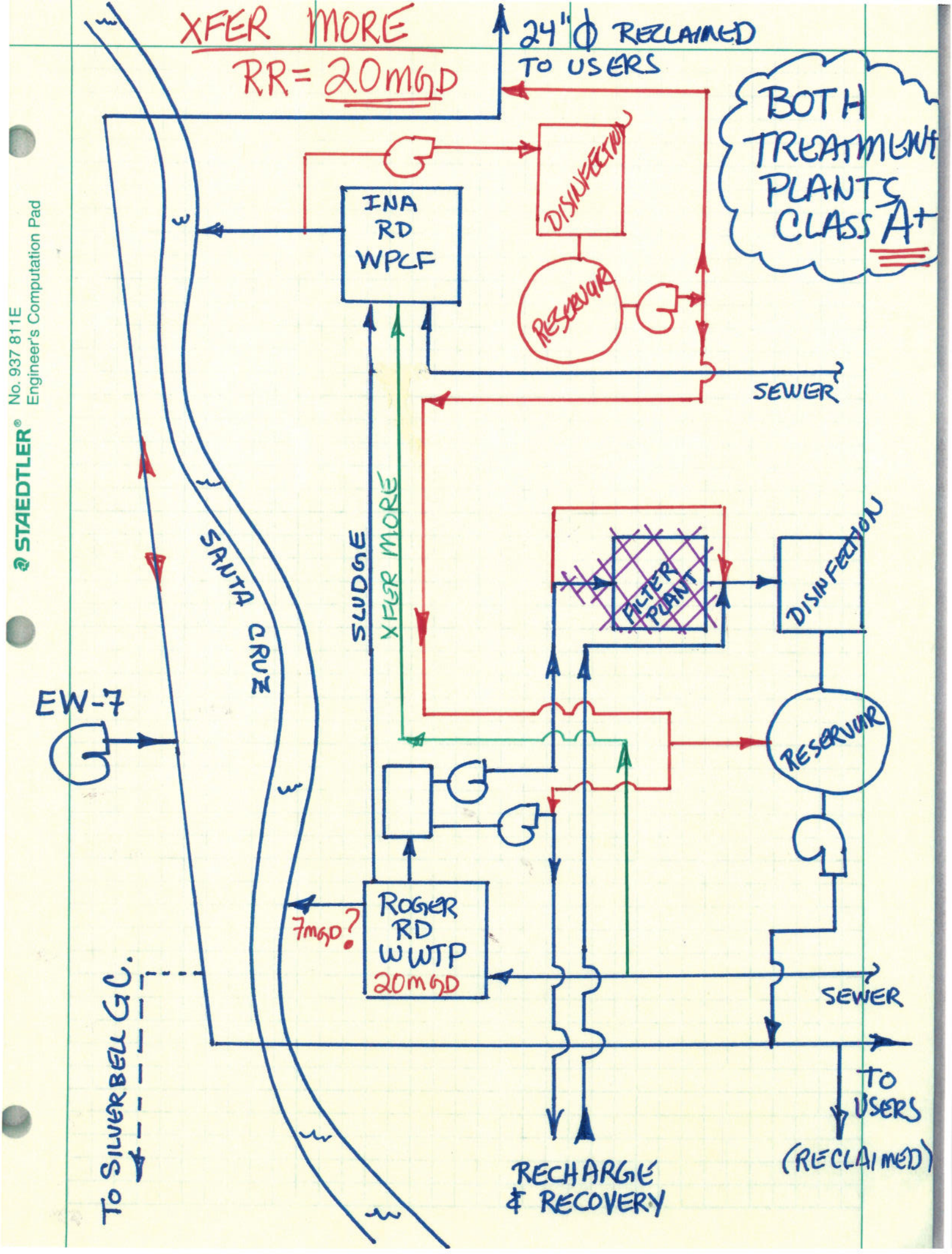

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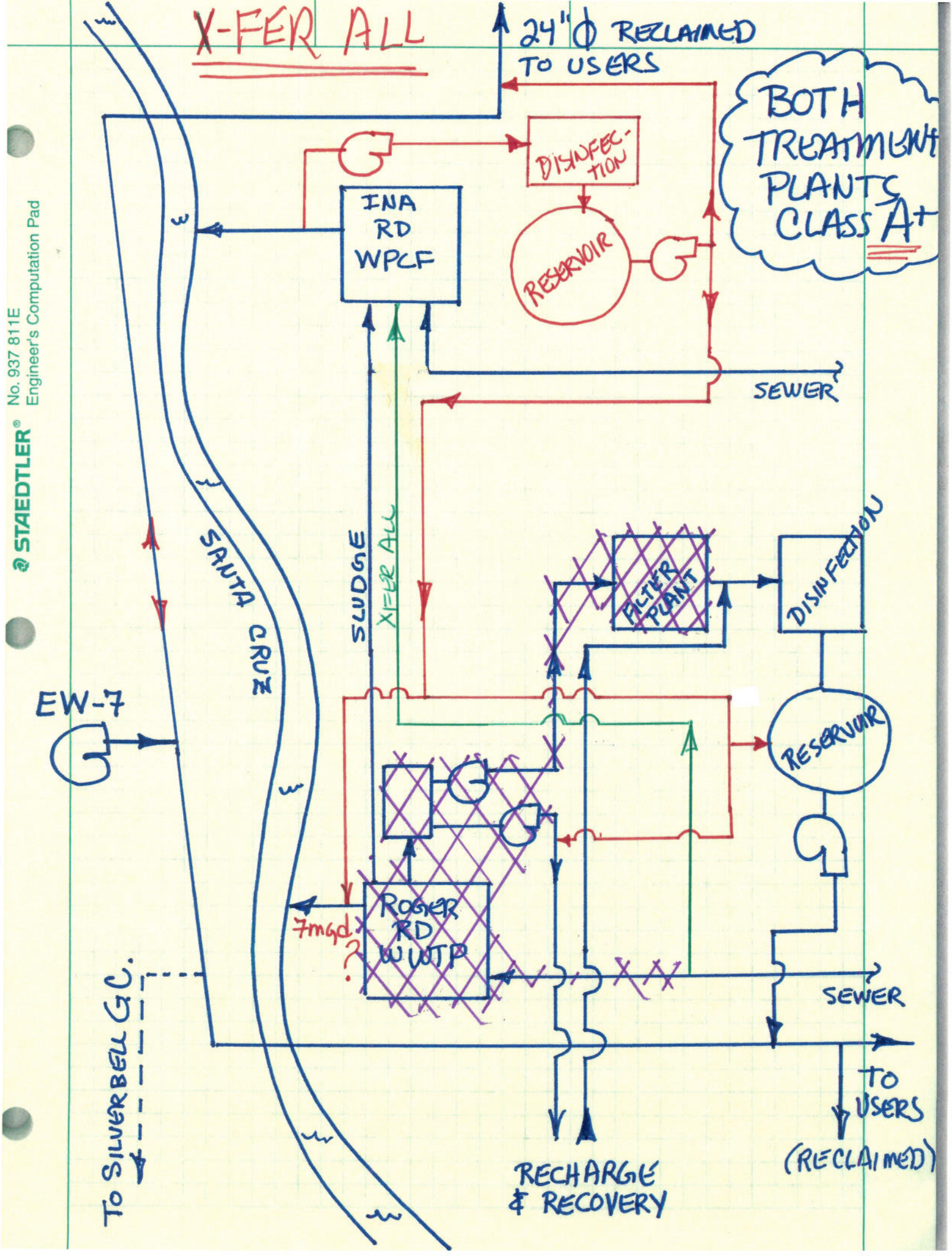

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