

Wastewater Reclamation Division

Kihei Wastewater Treatment Grit System CBS-5026

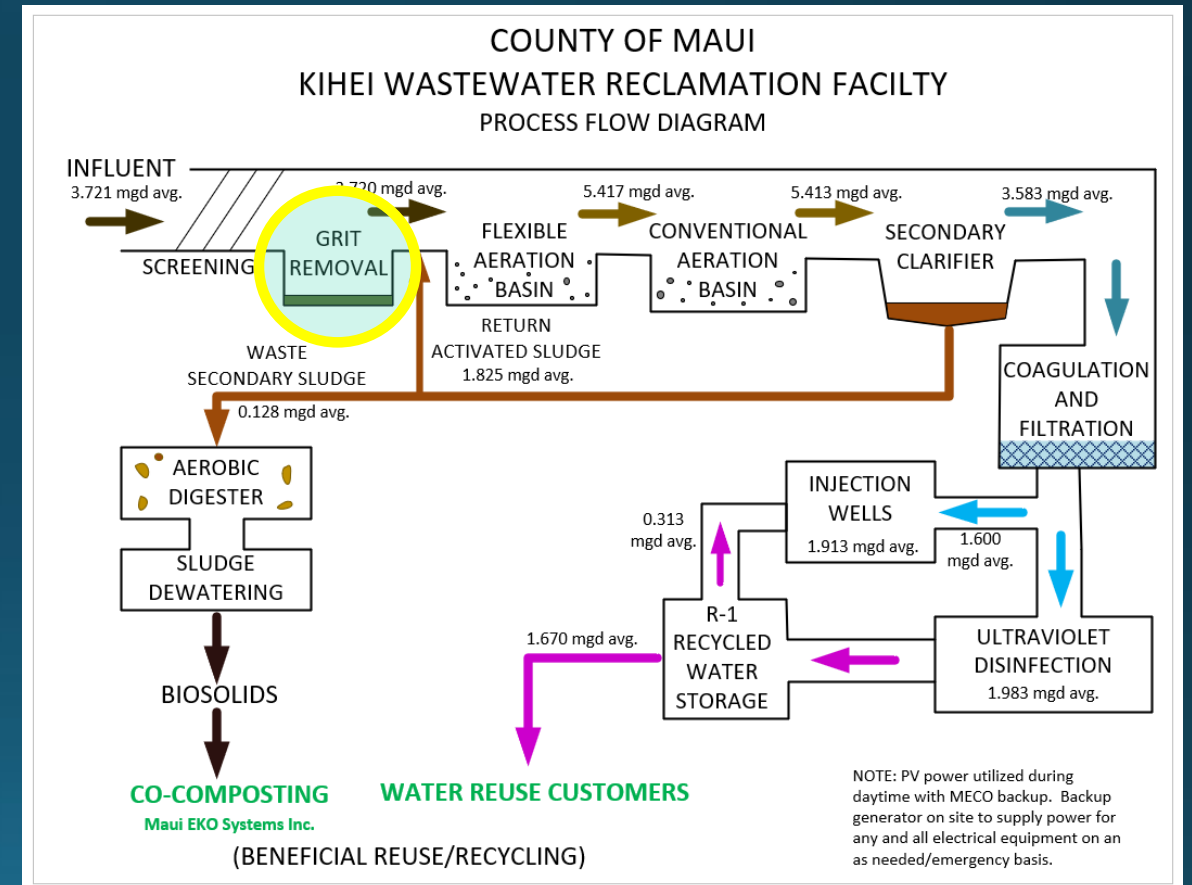
INFRASTRUCTURE AND TRANSPORTATION COMMITTEE MEETING (IT-36)

June 6, 2022

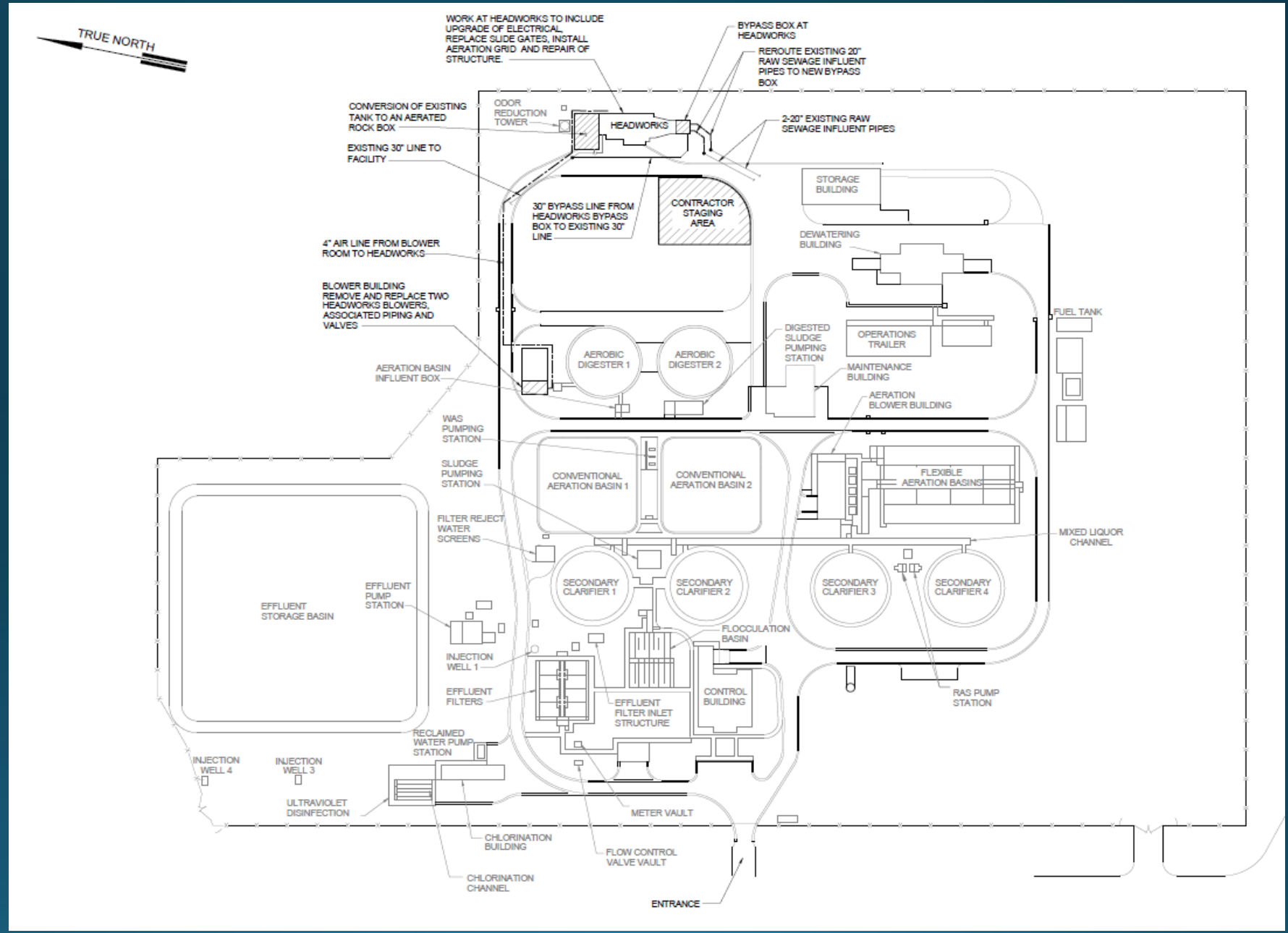
Received at IT meeting on 06/06/2022

Kihei WWRF Process

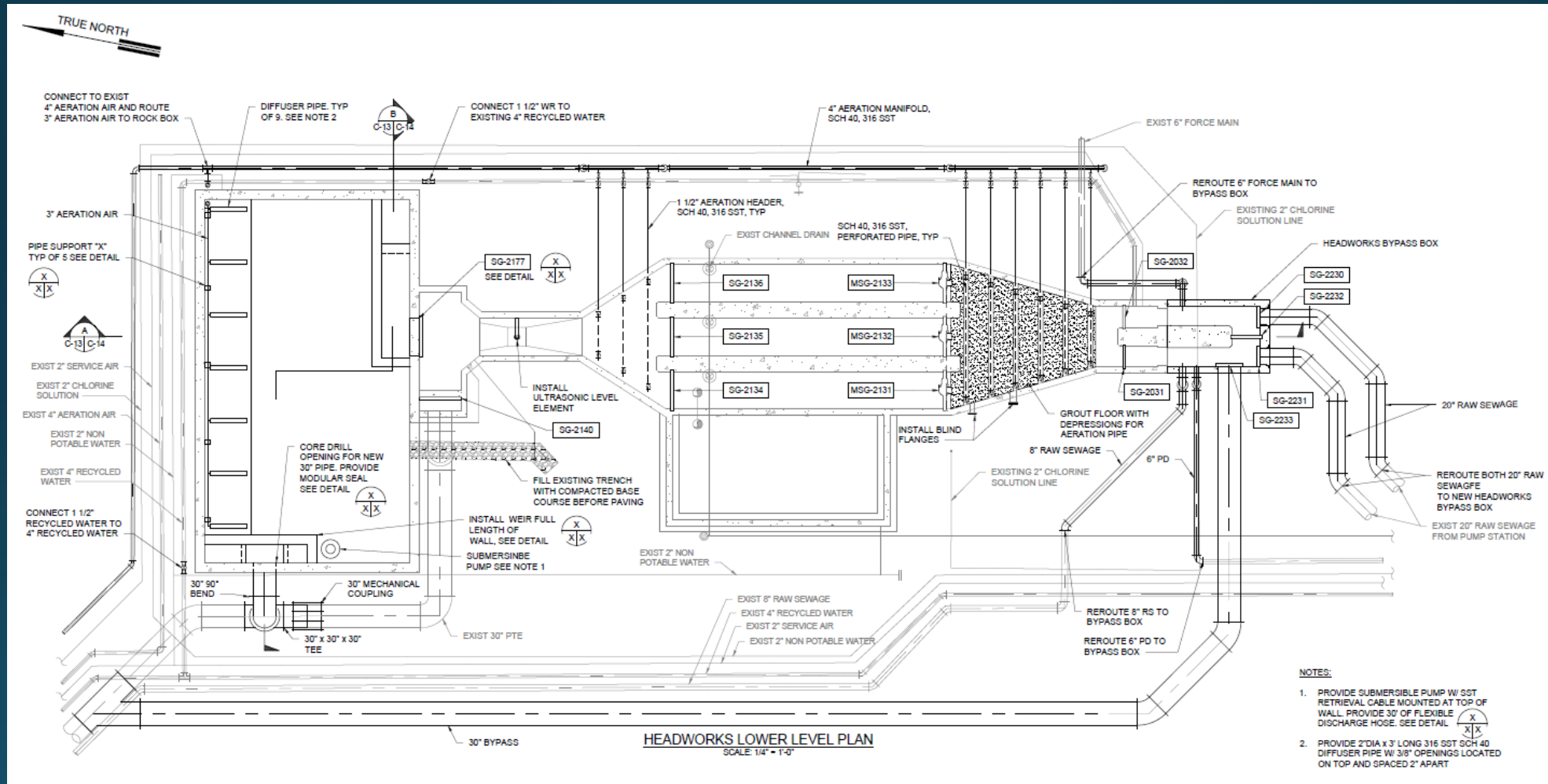
- Grit Removal is the second stage of wastewater treatment following screening for large debris/paper products.
- Grit includes solid materials that are “heavier” (higher specific gravity) than the organic biodegradable solids in the wastewater . It includes sand, gravel, cinder, rock, eggshells, bone chips, seeds, coffee grounds, and large organic particles, such as food waste.
- There is currently not an operating system in the grit chamber in Kihei resulting in nearly 100% passing thru to downstream basins.
- Accumulated grit in aeration basins is difficult to clean, causes additional energy usage when it covers diffusers and makes the biological process less efficient.



Kihei WWRF



Kihei WWRF Headworks



Getting Grit Out

- Grit is going to settle somewhere
- We can attempt to grab it at the beginning, or
- Empty larger aeration basins down stream that are more complicated to clean due to aeration piping, diffusers and their size
- Taking down large basins is more difficult as flow continues to grow and wastewater needs to be treated
- Dry the grit before transporting to landfill

Table 2-1. Grit Classification with Settling Velocity and Flow

Grit Classification	Grit Particle Size (Ps) (micron)	Settling Velocity (Vs) (fpm)
Very Light	75	$V_s \leq 0.97$
Light	110	$0.97 < V_s \leq 1.60$
Medium - Light	150	$1.60 < V_s \leq 3.00$
Medium – Heavy	210	$3.00 < V_s \leq 4.30$
Heavy	330	$4.30 < V_s \leq 6.00$
Very heavy	Ps > 330	$V_s > 6.00$

fpm=feet per minute

Basin Cleaning Considerations



- Volume of removal
- Manpower requirement
- Safety considerations
- Time to complete
- Equipment used
 - Vactor Trucks
 - Shovels
 - Conveyors
- Frequency
- Maintenance Priorities
- Displaced Wastewater Flow



Project Time Line

Initial Study by Brown and Caldwell to evaluate 6 different alternatives.

Expected costs \$6+M

2016

- 1 Maintain status quo
- 2 Replace in kind
- 3 Eutek TeaCup/Eutek Grit Snail
- 34 Induced Vortex Grit Removal
- 5 Aerated Grit Removal
- 6 HeadCell System

2020

Follow up Study by HDR completed . Evaluated two additional alternatives. Included a grit characterization study

- 1 Status Quo
- 2 Rock Box Settler
- 3 Huber Grit Wolf

Started the design process for the new system.

Expected Cost <\$4M

FY2021

FY2023

Expected construction of the chosen system

Cost of Construction

- Demolition of Existing Equipment
- Structural Repairs to Existing Basin
- New Blowers/Airline to Headworks
- Piping Modifications
- Modifications to Blower Building
- Construction of Grit System Bypass
- Electrical and Instrumentation Upgrades

KIHEI WWRF GRIT SYSTEM REPLACEMENT - 50% SUBMITTAL			
PROJECT TITLE			
KIHEI WWRF GRIT SYSTEM REPLACEMENT			
ACTIVITY			
County of Maui			
PREPARED BY (Name)			DATE
HDR			August 2021
ACF		CATEGORY CODE	
		\$/SYS	SYS QUAN (UM)
			TOTAL
KIHEI WWRF GRIT SYSTEM REPLACEMENT - 50% SUBMITTAL			
001	Mobilization	\$ 103,128	1 \$ 103,128
002	Field Office	\$ 70,540	1 \$ 70,540
003	Headworks Demolition	\$ 186,566	1 \$ 186,566
004	Blower Building Demolition	\$ 16,268	1 \$ 16,268
005	Site Piping	\$ 258,807	1 \$ 258,807
006	Headworks Modifications	\$ 1,832,836	1 \$ 1,832,836
007	Blower Building Modifications	\$ 63,302	1 \$ 63,302
008	Structural Repairs	\$ 435,889	1 \$ 435,889
009	Electrical and Instrumentation	\$ 614,645	1 \$ 614,645
TOTAL			\$ 3,581,980

Thank you, Questions?