



CASE STUDY:

CITY OF WEST RICHLAND

50,000 GPD MEMPAC™-1
West Richland, WA



DESIGN PARAMETERS

MODEL SUPPLIED: **MEMPAC-I**

INFLUENT PARAMETERS

AVERAGE DAILY FLOW	50,000 GPD
BIOCHEMICAL OXYGEN DEMAND	8,000 MG/L
TOTAL SUSPENDED SOLIDS	600 MG/L
INFLUENT TYPE	WINERY PROCESS WASTEWATER

EFFLUENT QUALITY

BIOCHEMICAL OXYGEN DEMAND	< 10 MG/L
TOTAL SUSPENDED SOLIDS	< 10 MG/L

PROJECT TEAM

CITY ENGINEER

CITY OF WEST RICHLAND
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PROJECT ENGINEER

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PROJECT MANAGER

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INSTALLATION CONTRACTOR

FLUID RESOURCE MANAGEMENT
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ENGINEER

WALLACE GROUP
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PROJECT DETAILS



OVERVIEW

Cloacina provided a MEMPAC-I for a planned industrial development

The Cloacina system was delivered in two treatment trains: one sludge handling train and one equalization handling system

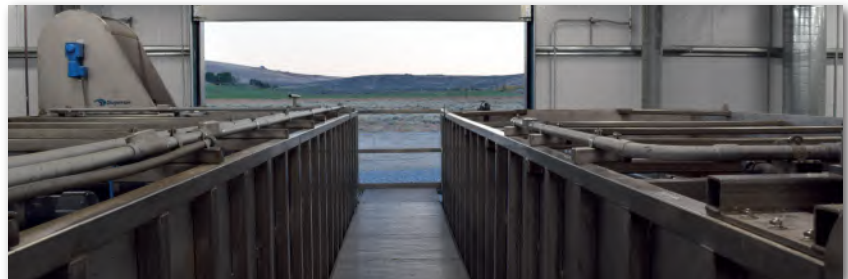
Cloacina provided the city staff with an electronic Operations and Maintenance Manual (OMM), operator checklist, Standard Operating Procedures (SOP) and on-site training

The plant currently sends treated effluent to the city sewer system but their intent is to utilize future treated effluent for irrigation purposes



"I have and will continue to recommend Cloacina to anyone needing a new or retrofitted treatment system. They will provide them with a top-of-the line product as one would expect to receive from the Roman Goddess of the Sewers."

-Drew Woodruff, City of West Richland



For project videos, additional photos and more information, visit cloacina.com/westrichland



CLOACINA SUPPLIED THE FOLLOWING FOR THIS PROJECT:

LIFT STATION: Package fiberglass duplex pump station which included: slide rails, pump bases, pumps, a level transducer, redundant floats, valve vault, isolation valves, aluminum lid and two locking hatches

HEADWORKS: 25,000 gallons of equalization storage, equalization pumps, influent flow meter, self-cleaning screen utilizing zero wash water, grit trap and automated pH adjustment system with sensor, pump and controls

PRIMARY TREATMENT: Roughing filter, fixed media, two-zone distribution header with auto valve, aeration header, auto aeration valves and aeration feed valve

SECONDARY TREATMENT: Fine bubble aeration diffusers, aeration blower, auto air valve, dissolved oxygen sensor and RAS pump

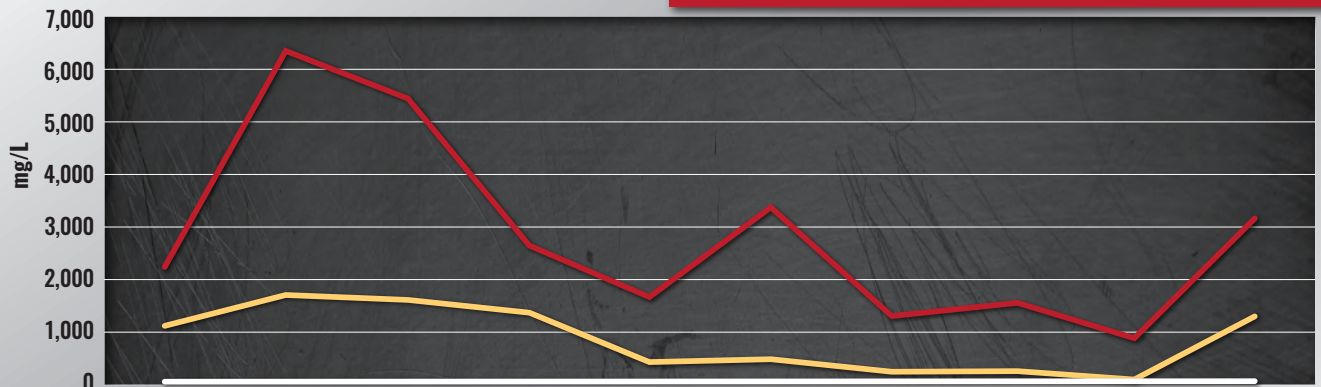
CLARIFICATION: Submerged flat sheet membranes, level transducer, air supply valve, permeate pump, permeate flow meter, CFM meter, online MLSS meter, clean-in-place pump, effluent pump, effluent flow meter, sludge wasting pump and two 25,000 gallon effluent equalization storage tanks

CONTROLS: Stainless steel MCC panels, touch screen controls computer and controls program

ADDITIONAL: Aluminum stairs and catwalks, self-cleaning system for pH, DO and MLSS probes, solids disposal: Cloacina DRYPAC System complete with 15 GPM volute dewatering press with 5,000 gallon aerated storage tank, polymer addition system and elevated platform for disposal into roll-off bin

2016 HARVEST - BOD

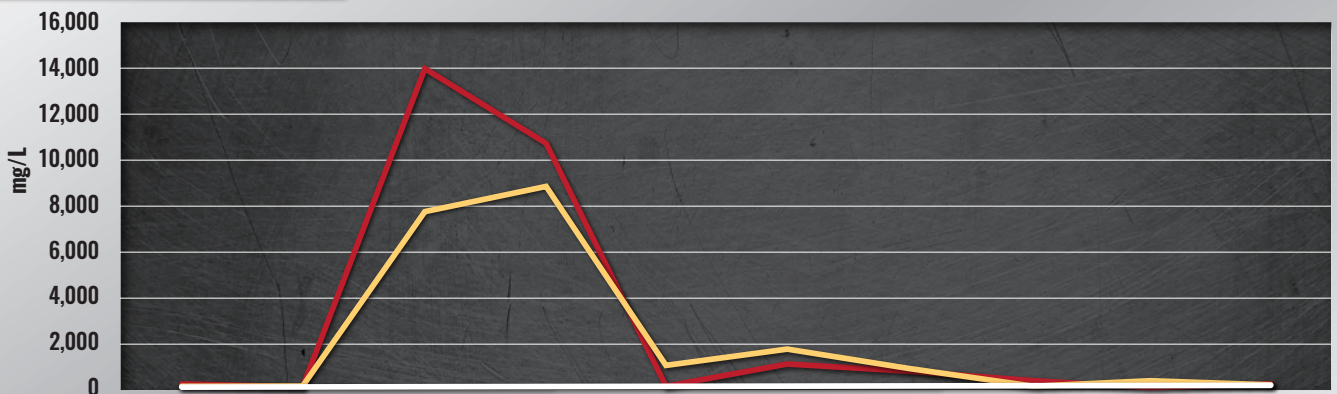
SAMPLE RESULTS: 2016 HARVEST



	09/06/16	09/20/16	09/28/16	10/05/16	10/12/16	10/21/16	10/27/16	11/02/16	01/18/17	02/08/17
Influent	2,226	6,390	5,475	2,676	1,708	3,405	1,338	1,581	925	3,207
Filter	1,125	1,725	1,632	1,384	438	511	250	296	115	1,320
Effluent	2	2	2	2	2	2	2	2	2	2

Graph illustrates Biochemical Oxygen Demand (BOD) reduction within the MEMPAC-I from system start-up through 2016 harvest

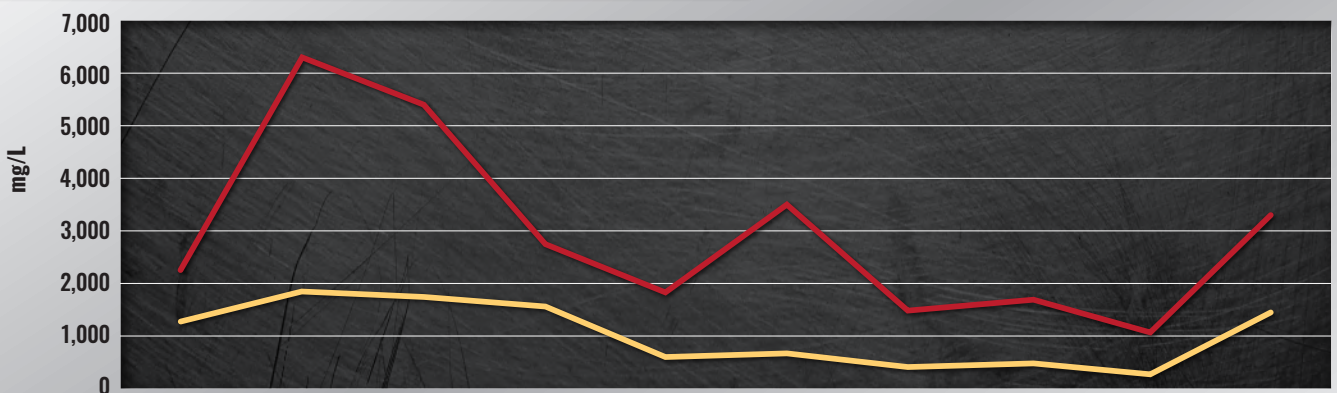
2016 HARVEST - TSS



	09/06/16	09/20/16	09/28/16	10/05/16	10/12/16	10/21/16	10/27/16	11/02/16	01/18/17	02/08/17
Influent	192	170	15,070	11,850	140	1,170	870	425	125	270
Filter	168	180	8,324	9,530	1,125	1,934	586	185	405	250
Effluent	1	1	5	3	5	5	2	4	4	8

Graph illustrates Total Suspended Solids (TSS) reduction by the MEMPAC-I from system start-up through 2016 harvest

2016 HARVEST - FILTER REMOVAL RATE (BOD)



	09/06/16	09/20/16	09/28/16	10/05/16	10/12/16	10/21/16	10/27/16	11/02/16	01/18/17	02/08/17
Influent	2,252	6,390	5,475	2,676	1,708	3,405	1,338	1,581	926	3,207
Filter	1,125	1,725	1,632	1,384	438	511	250	296	115	1,320
Removal Rate	50.27%	73.00%	70.19%	48.28%	74.36%	84.99%	81.32%	81.28%	87.58%	58.84%

Graph illustrates BOD removal performance by the MEMPAC-I from system start-up through 2016 harvest