POMREQ 2012
SABAH

Achieving a BOD below 20 for POME.

"Is it a Myth or a Reality"

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Existing Technologies Available:-

1) **DAF System.**

2) **Activated Sludge System.**

3) **Aerated Lagoon System.**

4) **Aerated Clarification Setting Tanks.**

5) **Biological Media System.**

So far **NONE** of the above systems**, CAN GUARANTEED BOD < 20 ppm CONSISTENTLY.**

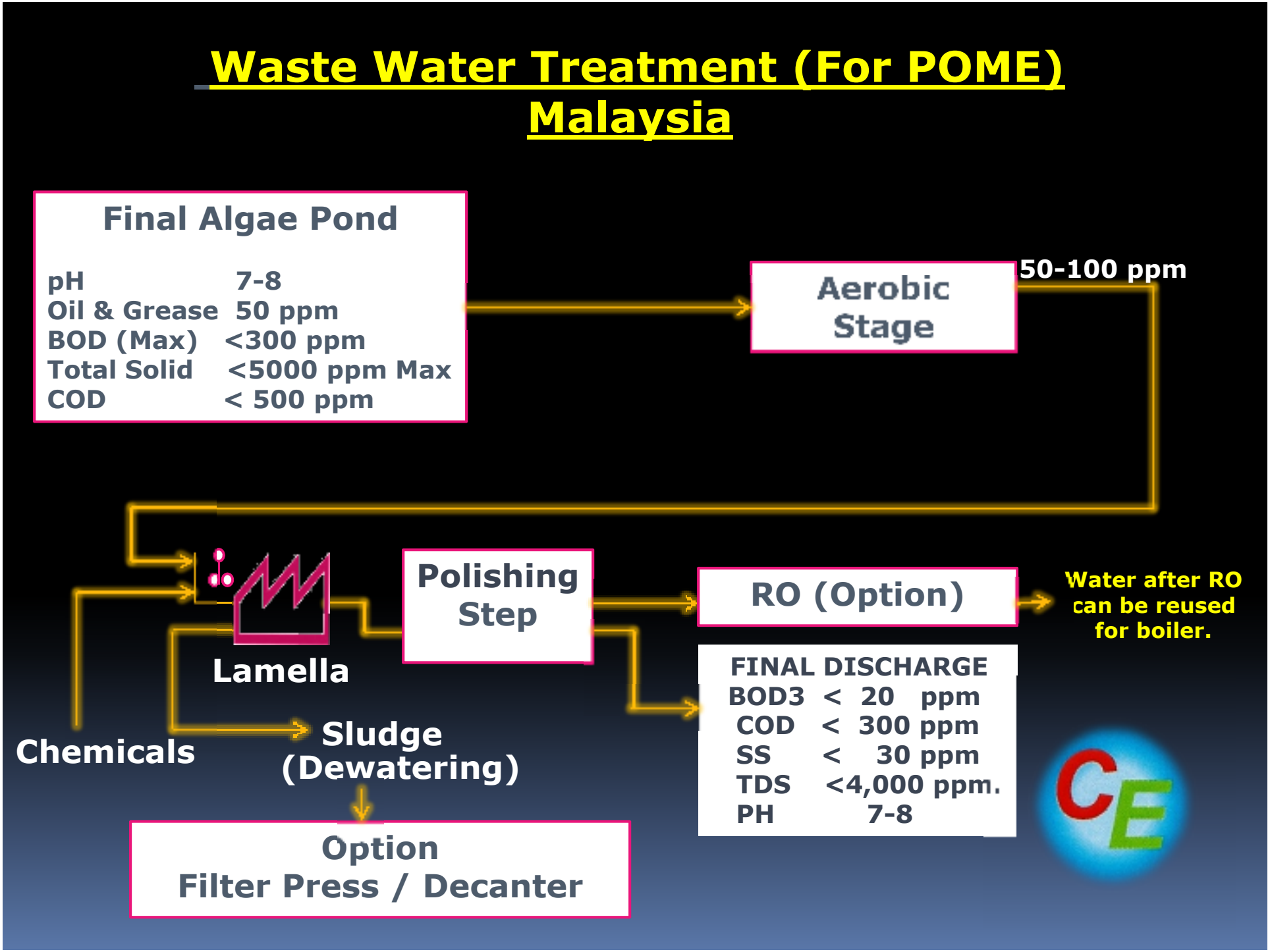
Recently a new method called the **BCMM TECHNOLOGY** has been **R&D in MPOB LABU MILL (AUG 2010- FEB 2011) & in NERAM FELDA MILL(JAN-AUG 2012),** shows **PROMISING** and **CONSISTENT** results.

BCMM TERTIARY POLISHING PLANT

- THE SYSTEM CONSISTS OF :-
- **Biological Method:-**
- Aeration
- **Chemical Method:-**
- Flocculation/Polymer
- **Mechanical Method:-**
- Lamella Separator
- Continuous Sand Filter
- **Membrane Method:-**
- UF Technology

(Bringing down & maintaining BOD < 20 ppm before discharge or to be reused for cleaning purpose.)

Waste Water Treatment (For POME) Malaysia



In Our R & D Study, we look at:-

1) Stability and Reliability of this Technology:
   In Maintaining and Achieving BOD<20 ppm consistently,
   In compliance to DOE Standards for POME discharge.

2) Efficiency for SS removal and clarity of discharged water.

3) Chemical Selection, Concentration and Chemical cost / m^3 of POME.

4) Operational and Maintenance Cost.

5) Whether the water can be recycle for Boiler Use without further treatment.

Final Algae Pond Intake to Aeration Tank (Neram Mill Felda) Trengganu.

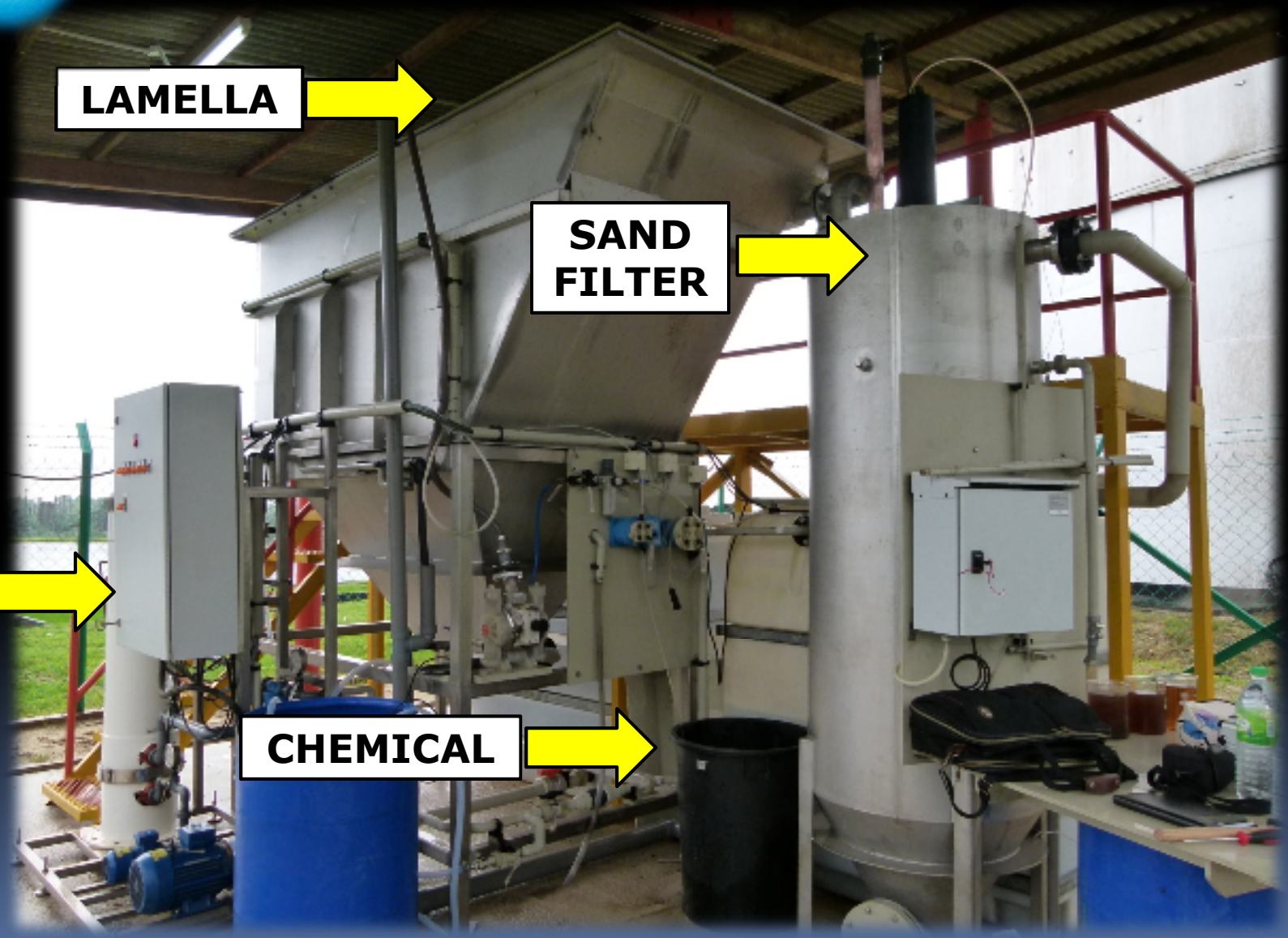
Aerobic Aeration Tanks

Aerators

Influent to Polishing Plant

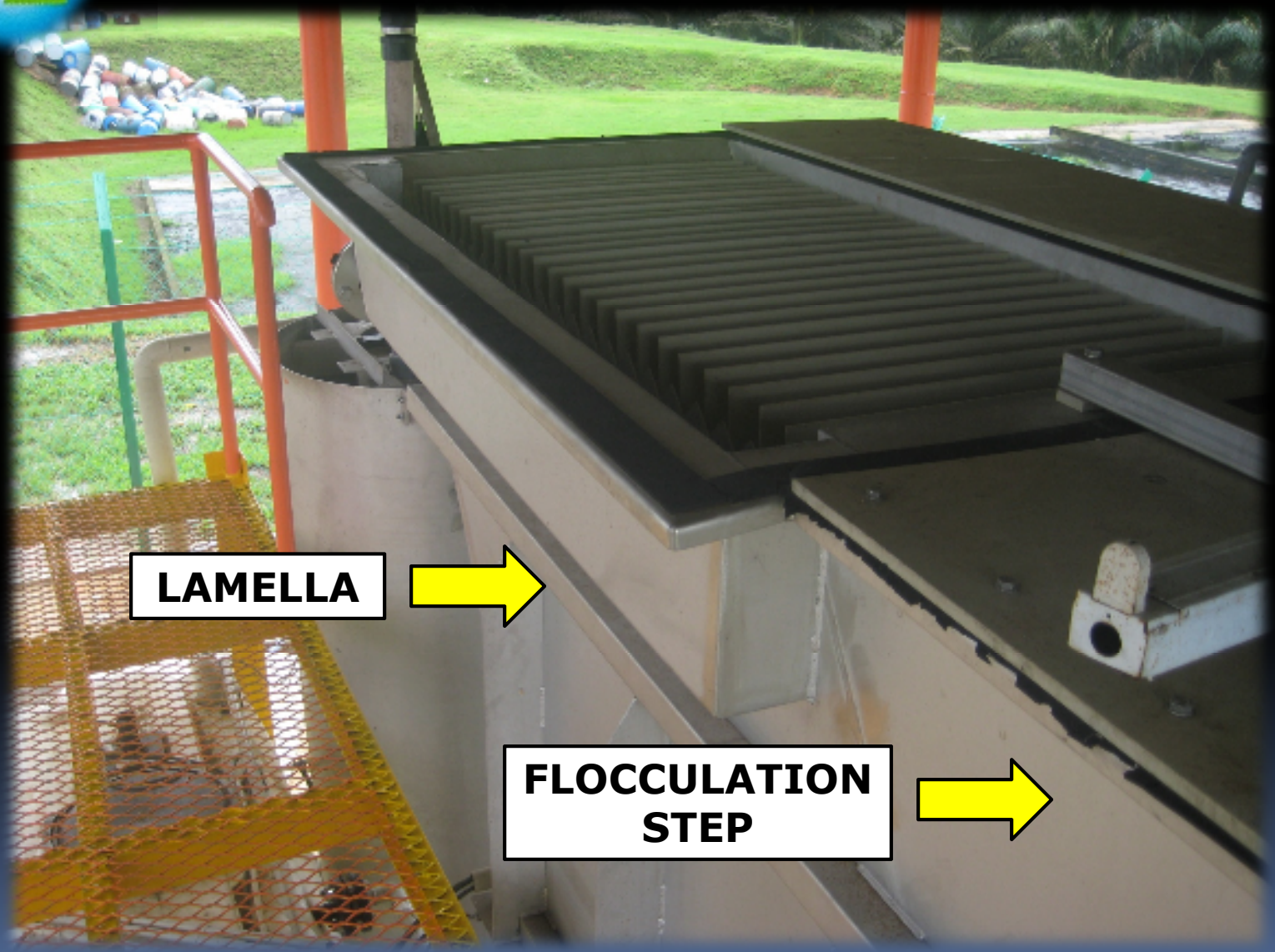
PILOT POLISHING PLANT

EQUIPMENT SET UP

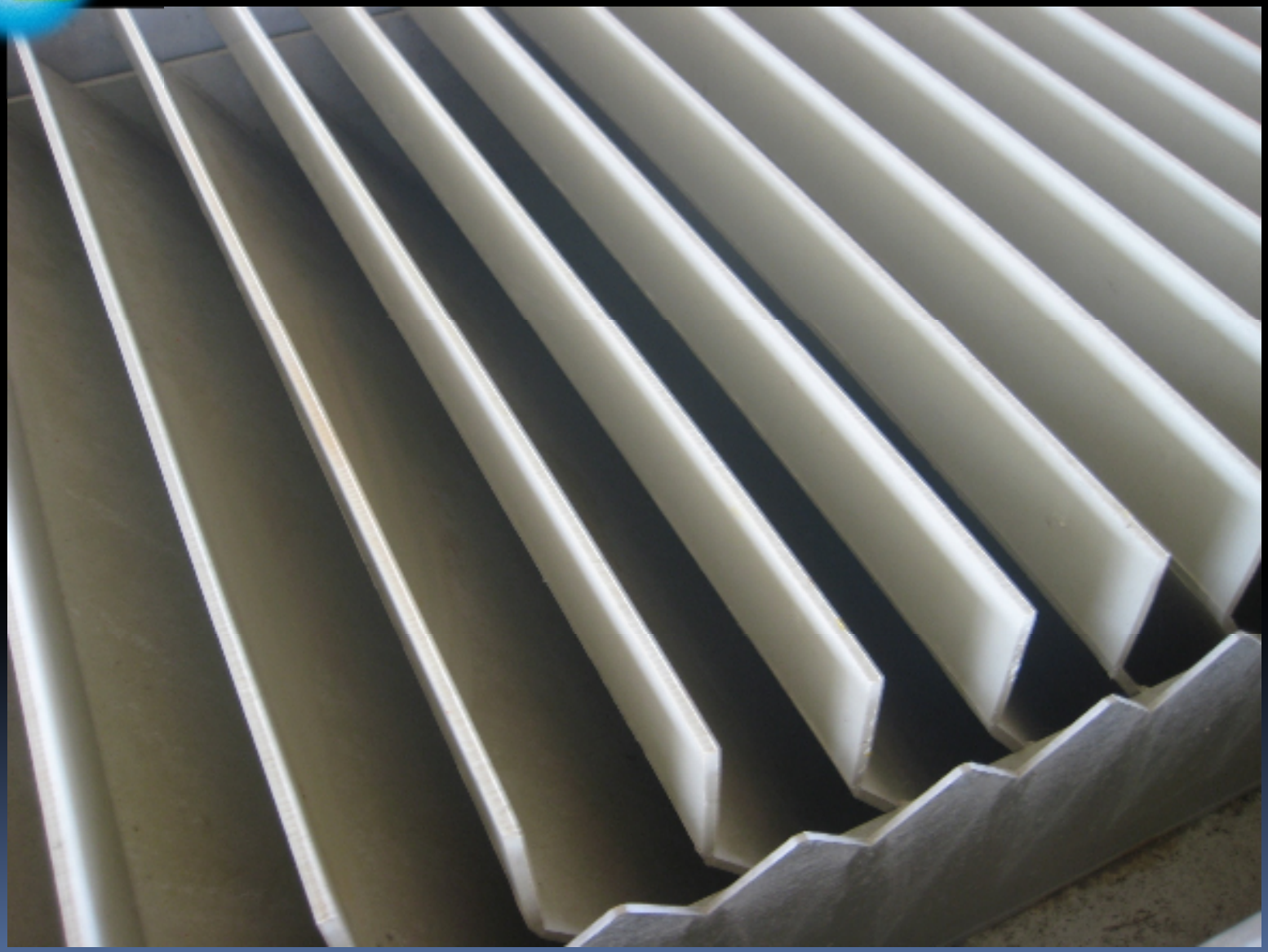


BUFFER TANKS

CHEMICAL AND SOLID REMOVAL



LAMELLA PLATES

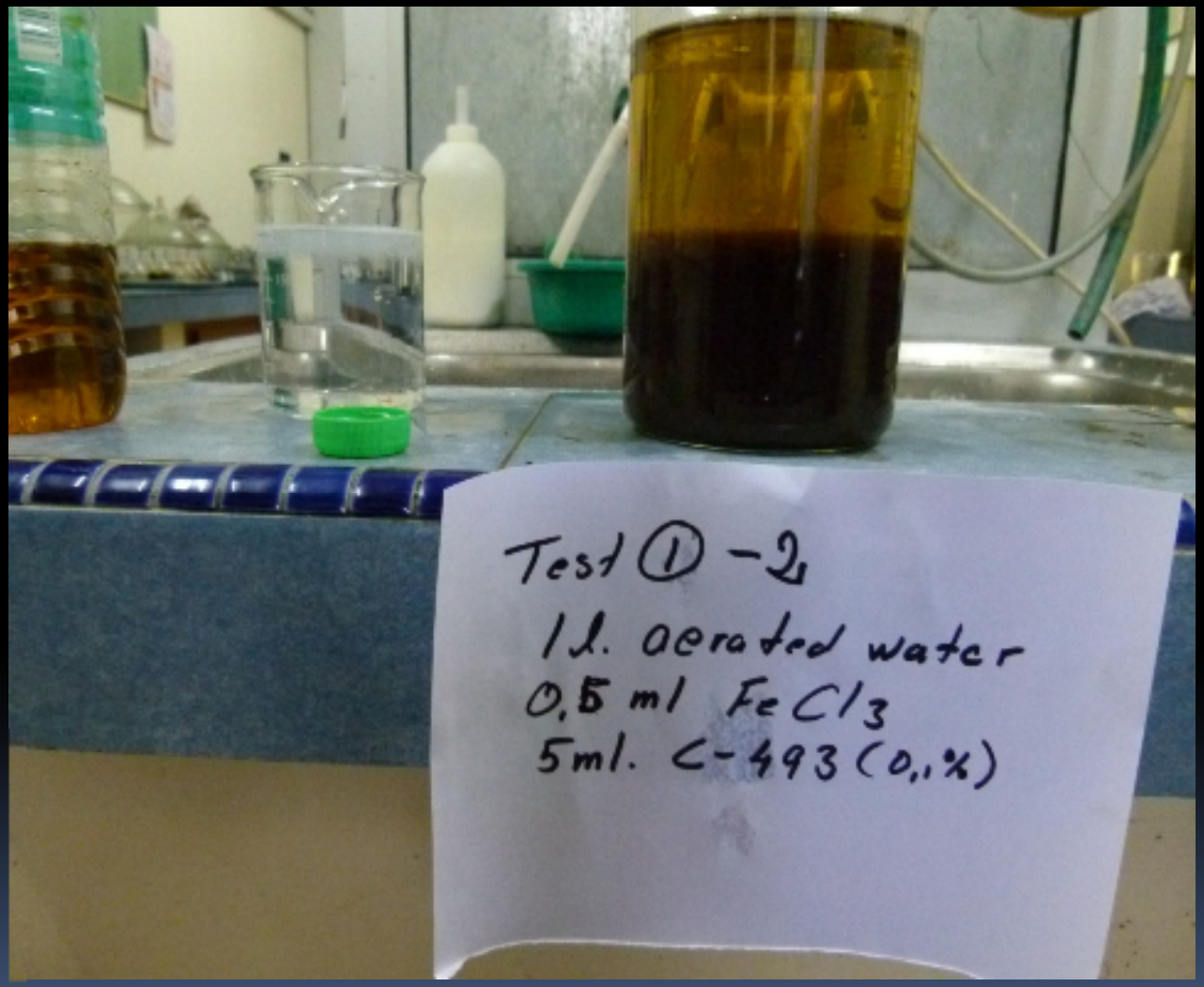


CONTINUOUS SAND FILTER

ULTRA FILTER SYSTEM

SAMPLES TAKEN

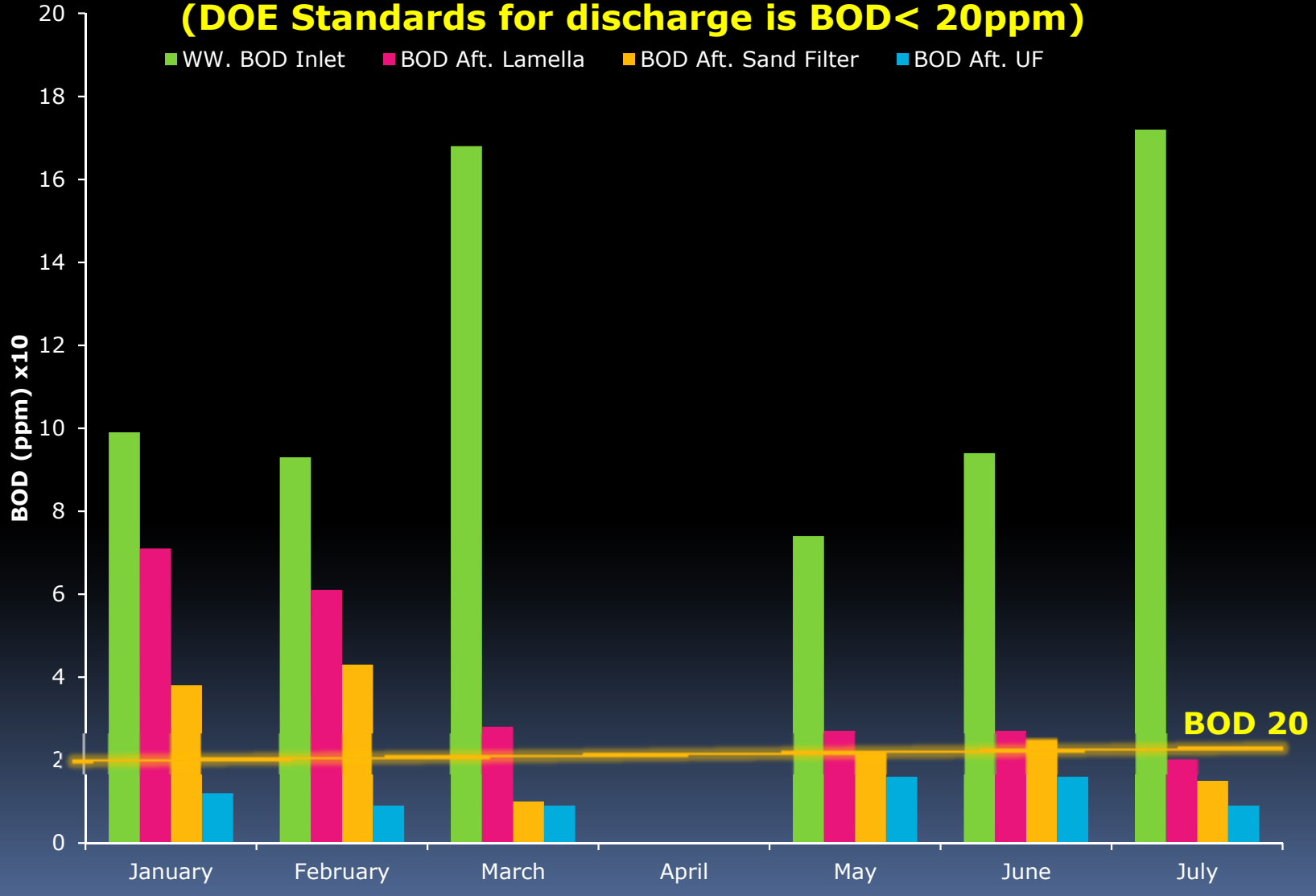
SAMPLE TAKEN FROM AREATED POND



SAMPLES – 11 JANUARY 2012

TEST RESULTS

FELDA NERAM TERTIARY PILOT PLANT
Test Results from month of Jan-July 2012
(DOE Standards for discharge is BOD< 20ppm)



No Aeration (From Algae Pond) **With Aeration (From Aeration Tank)**

Without Aeration

TEST RESULT FROM PILOT PLANT
FROM: ALAF - FELDA NERAM

Flocculant Used: Poly Aluminum Chloride (PAC).

12 January 2012	BOD	SS	TS	COD	pH	AN	TN
Inlet from Final pond	99	310	3283	613	8	87	136
After Lamella	71	229	3016	454	7.3	84	125
After Sand filter	38	191	2924	462	7.3	92	139
After UF Out	12	19	2723	299	7.8	78	119

Flocculant Used: Poly Aluminum Chloride (PAC).

20 February 2012	BOD	SS	TS	COD	pH	AN	TN
Inlet from Final pond	93	535	2827	480	8.12	83	131
After Lamella	61	268	2774	569	7.46	76	118
After Sand filter	43	216	2631	360	7.39	72	112
After UF Out	9	28	2340	222	7.68	58	62

Flocculant Used: Ferric Chloride (Fe Cl.) + Polymer Used: Kimera C-493

21 March 2012	BOD	SS	TS	COD	pH	AN	TN
Inlet from Final pond	168	1280	-	-	-	-	-
After Lamella	28	64	-	-	-	-	-
After Sand filter	10	46	-	-	-	-	-
After UF Out	9	9	2319	234	7.92	24	39

With Aeration

TEST RESULT FROM PILOT PLANT
FROM: ALAF - FELDA NERAM

Flocculant Used: Ferric Chloride (Fe Cl). + Polymer Used: Synergy 1598 C

15 May 2012	BOD	SS	TS	COD	pH	AN	TN
Inlet from Aerated pond	74	628	-	-	7	-	-
After Lamella	27	73	-	-	7	-	-
After Sand filter	21	63	-	-	7	-	-
After UF Out	16	28	2500	150	7	-	-

Flocculant Used: Ferric Chloride (Fe Cl). + Polymer Used: Synergy 1598 C

18 June 2012	BOD	SS	TS	COD	pH	AN	TN
Inlet from Aerated pond	94	482	4430	413	7.76	4	6
After Lamella	27	129	3980	921	7.78	2	6
After Sand filter	25	80	3948	281	7.81	2	7
After UF Out	16	11	3819	209	7.97	2	5

Flocculant Used: Ferric Chloride (Fe Cl). + Polymer Used: Synergy 1598 C

6 July 2012	BOD	SS	TS	COD	pH	AN	TN
Inlet from Aerated pond	172	680	4394	508	8.87	15	21
After Lamella	20	67	3913	225	8.57	3	6
After Sand filter	15	40	3902	215	8.56	3	6
After UF Out	9	10	3884	205	8.57	3	5

Conclusions:-

1) Stability of the system. Consistently achieving BOD < 20 ppm. Meeting DOE Std. for discharge.

2) The SS drops tremendously from 700ppm to < 30 ppm after UF.

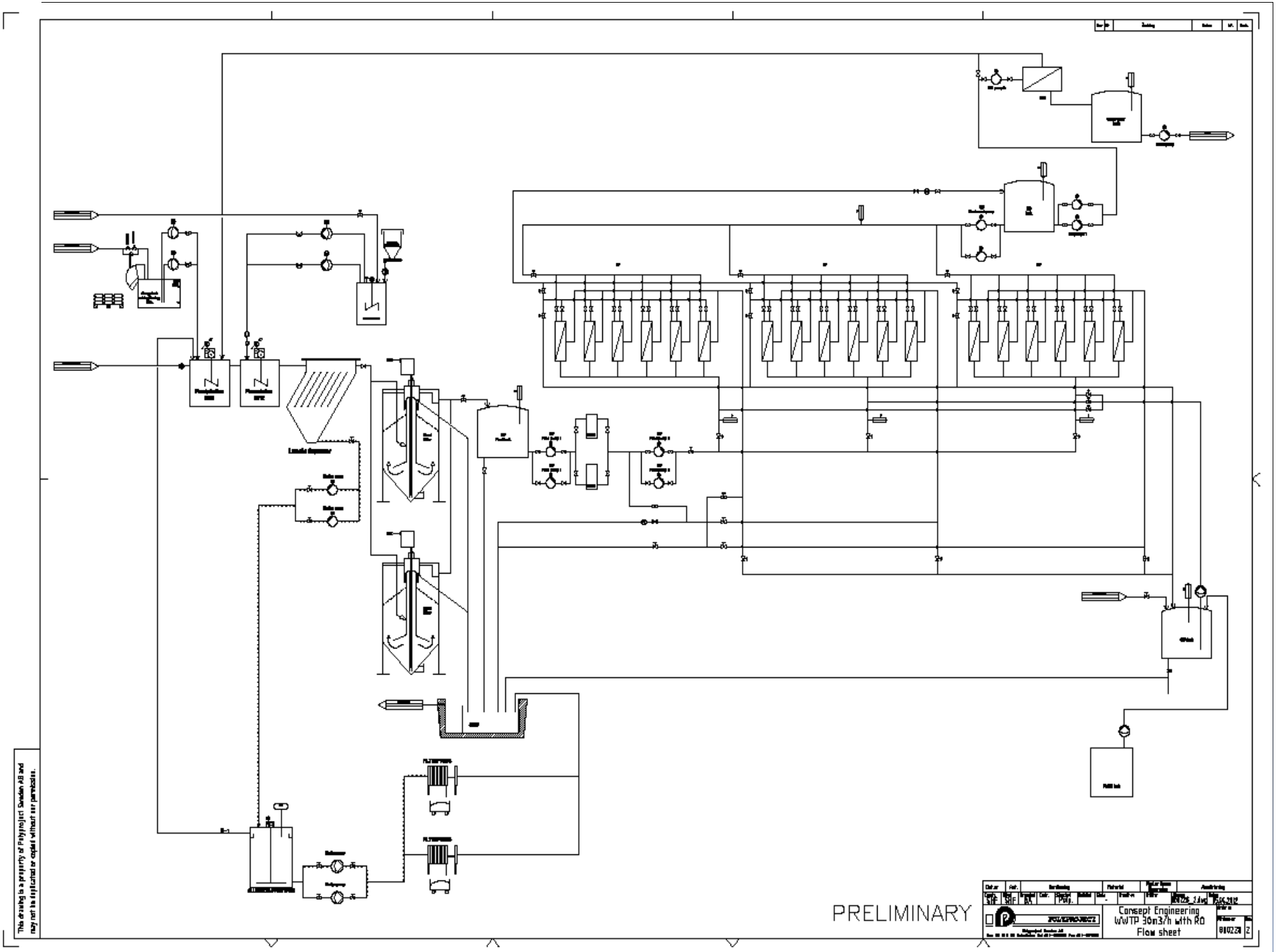
3) TDS does not change much. Very high> 3000 ppm (Cannot be reused for boiler, further treatment needed.)

4) PH between 7-8.

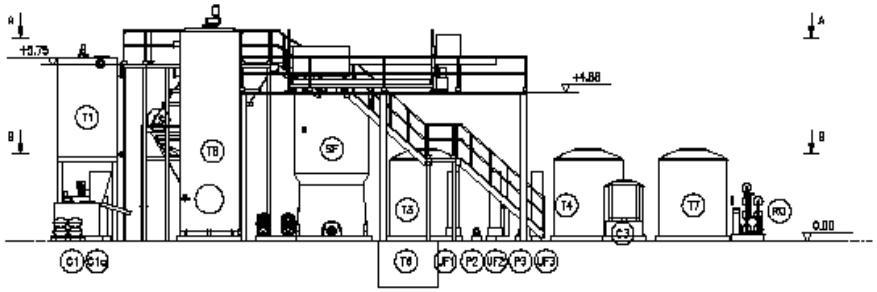
5) COD after UF < 300 ppm.

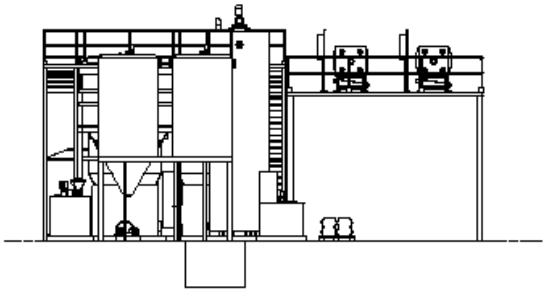
6) Low Chemical Treatment Cost: RM 0.20 / m^3 POME.

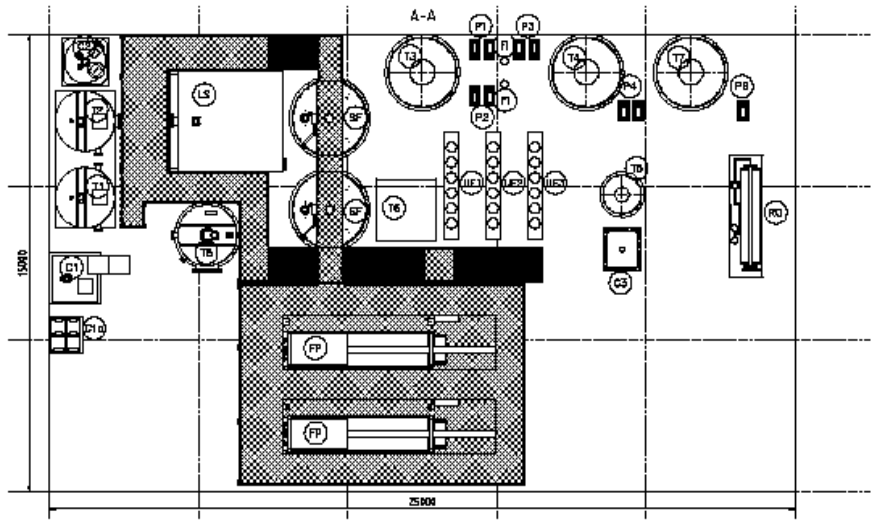
Polishing Plant (Schematic)

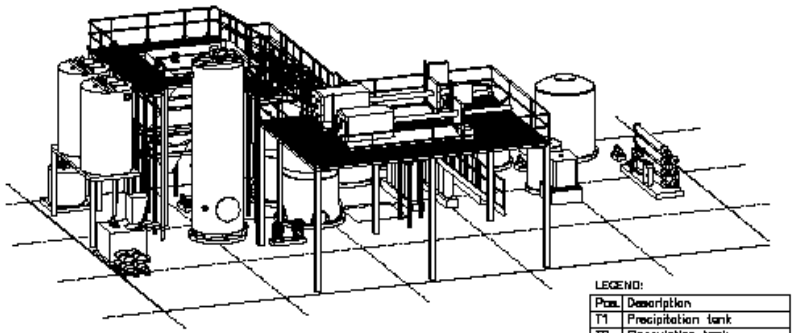

PRELIMINARY
Concept Engineering
WWTP 30m3/h with RO
Flow sheet
This drawing is a property of Polyplant Sweden AB and may not be duplicated or copied without our permission.

Polishing Plant Layout









Pos.	Description
T1	Precipitation tank
T2	Flocculation tank
T3	UF Feed tank
T4	RO Tank
T5	CIP Tank
T6	Sump
T7	Clean water tank
T8	Sludge tank
LS	Lamella separator
SF	Sand filter
F1	Filter
UF1	Ultra Filter 1
UF2	Ultra Filter 2
UF3	Ultra Filter 3
RO	RO plant
FP	Filter Press
P1	UF Feed pump 1
P2	UF Feed pump 2
P3	UF Back wash pump
P4	RO pumps
P5	Sludge pump
P6	Outlet pump
P7	Filter Press pumps
C1	Coagulant tank
C1a	Coagulant socke
C2	Polymer tank
C3	NaOH tank

PRELIMINARY

Concept Engineering
WWTP Layout
30m3/h with RO

Commercial Polishing Plant for Waste Water.

THANK YOU