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Critical control points

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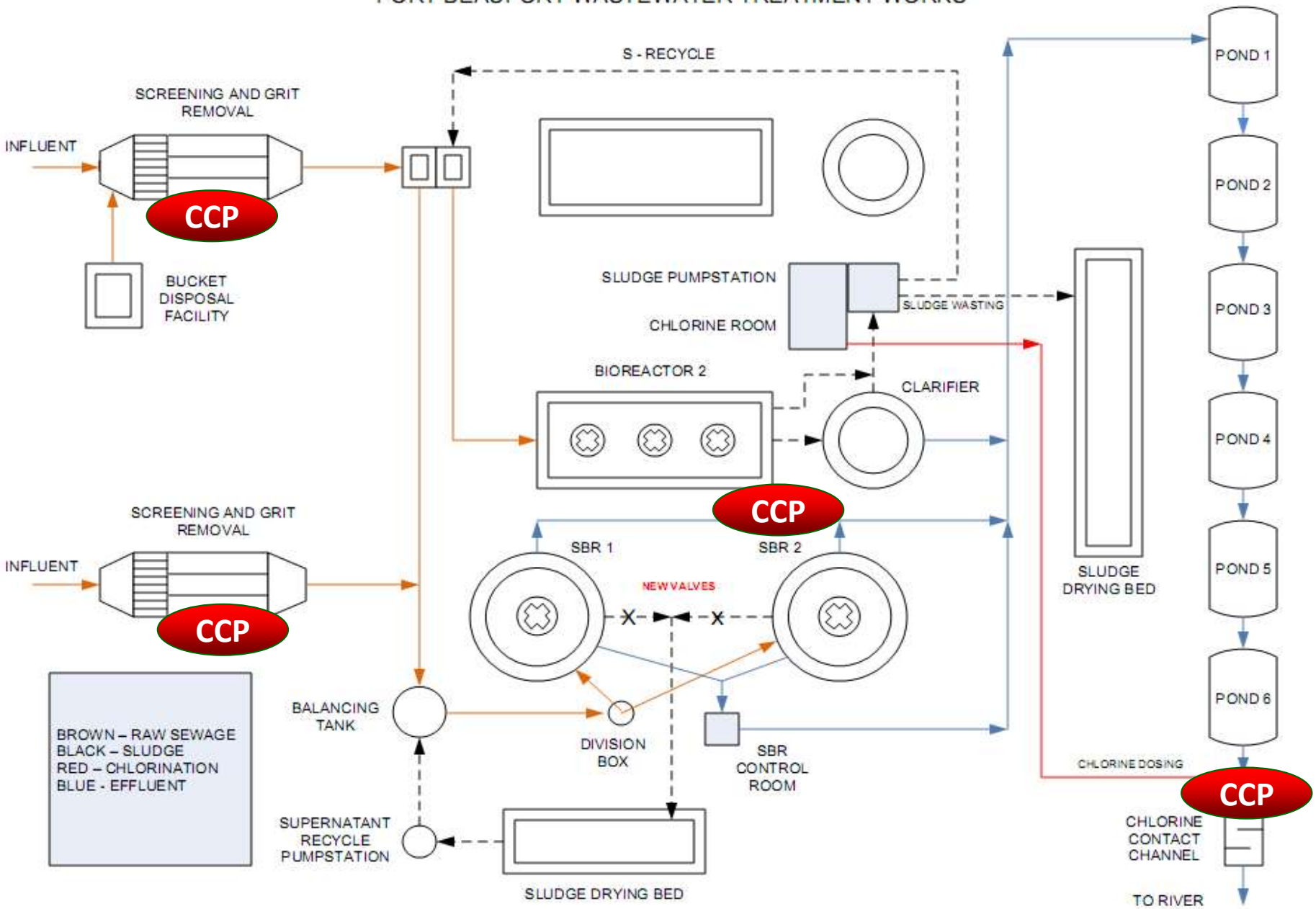
Section 3.

CHECKLIST FOR CONDUCTING A W_2RAP

FORT BEAUFORT WASTEWATER TREATMENT WORKS



EXAMPLE: Monitoring of Control Measures and Response Protocol

WWTW's Compliance Alert Levels			
Compliance Monitoring Sample	**Alert Levels requiring action**		**Response Protocol**
WWTW A Final Effluent	COD > **75** mg/L TSS > **25** mg/L **5.5** > pH > **9.5** EC > **150** mS/m Ammonia > **6** mg/L as N Nitrate > **15** mg/L as N Ortho- P > **10** mg/L as P	Total Cl_2 **<** **0.3** mg/L E. Coli > **100** #/100 mL Temp > **30^0 C** Cd > **0.005** mg/L Cr > **0.05** mg/L Cu > **0.01** mg/L Zn > **0.1** mg/L Pb > **0.01**mg/L	Laboratory personnel to notify: -Mr. -Mrs - and then Response Protocol to be followed
WWTW Y Final Effluent	COD > **75** mg/L TSS > **25** mg/L **5.5** > pH > **9.5** EC > **150** mS/m Ammonia > **6** mg/L as N Nitrate > **15** mg/L as N Ortho- P > **10** mg/L as P	Total Cl_2 **<** **0.3** mg/L E. Coli > **100** #/100 mL Temp > **30^0 C** Cd > **0.005** mg/L Cr > **0.05** mg/L Cu > **0.01** mg/L Zn > **0.1** mg/L Pb > **0.01**mg/L	Laboratory personnel to notify: -Mr. -Dr - and then Response Protocol to be followed

Operational Alert Levels			
ACTIVATED SLUDGE WASTEWATER TREATMENT WORKS			
Operational Samples	**Alert Levels**		**Actions to be taken**
Raw inlet	COD > **1000** mg/L Ammonia > **100** mg/L as N **5.5** > pH > **9.5** EC > **150** mS/m Settl. solids > **20** mL/L	Cd > **0.005** mg/L Cr > **0.05** mg/L Cu > **0.01** mg/L Zn > **0.1** mg/L Pb > **0.01** mg/L	• Check for possible illegal industrial effluent discharge • Do more frequent measurements of DO levels, pH and MLSS in the activated sludge reactor
Raw inlet settled	COD > **400** mg/L		• Check operation of PST (faulty scrapers; blockages) • Check for oils and fats on the water surface
Activated sludge reactor	DO < **0.5** mg/L DO > **2.0** mg/L		• Increase aeration capacity or cycles • Decrease aeration cycle / adjust VSD
	MLSS < **2000** mg/L		• Reduce discharge of WAS and allow MLSS – levels to increase to 4000 mg/L • Refer to temperature/MLSS SoP
	MLSS > **6000** mg/L		• Gradually waste more sludge on a daily basis to reduce the MLSS to 4000 mg/L • Refer to temperature / MLSS SoP
	pH < **7.0**		• Add lime to the inlet works to maintain the pH in the reactor at 7.0 or above
Secondary settling tanks	COD > **75** mg/L		• Check for sludge carry – over from secondary settling tanks • Check RAS recycle rates • Check for bulking sludge • Check for rising sludge ***Take actions to rectify as appropriate***

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Constituent	General Limit
Microbiological Compliance	
E. coli / faecal coliforms (cfu / mpn per 100 mℓ)	1 000
Chemical Compliance	
Ammonia (ionised and un-ionised) as Nitrogen (mg/ℓ)	6
Chemical Oxygen Demand (mg/ℓ)	75*
Nitrate/Nitrite as Nitrogen (mg/ℓ)	15
Ortho-phosphate as phosphorus (mg/ℓ)	10
Physical Compliance	
pH	5.5 – 9.5
Electrical Conductivity (mS/m)	70 -150 max mS/m above intake
Suspended Solids (mg/ℓ)	25
Additional Determinants	
Chlorine as Free Chlorine (mg/ℓ)	0.25
Fluoride (mg/ℓ)	1
Soap, oil or grease (mg/ℓ)	2.5
Dissolved Arsenic (mg/ℓ)	0.02
Dissolved Cadmium (mg/ℓ)	0.005
Dissolved Chromium (VI) (mg/ℓ)	0.05
Dissolved Copper (mg/ℓ)	0.01
Dissolved Cyanide (mg/ℓ)	0.02
Dissolved Iron (mg/ℓ)	0.3
Dissolved Lead (m/l)	0.01
Dissolved Manganese (mg/ℓ)	0.1
Mercury and its compounds (mg/ℓ)	0.005
Dissolved Selenium (mg/ℓ)	0.02
Dissolved Zinc (mg/ℓ)	0.1
Boron (mg/ℓ)	1

Verification

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- DWA monthly compliance monitoring
- Green Drop scores
- RPMS
- Benchmarking with peers that employ similar technology or operate under similar circumstances.

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Effective and responsive management requires that:

- Actions be taken in response to variations during normal operational conditions
- Actions taken to 'incidents' where loss of control of the system occur
- Procedures be followed in unforeseen or emergency situations

= Incident Response Management Protocol against the different alert levels

- Monthly inspection reports by Regional Managers
- Operational meeting and reporting on compliance and deviations from critical limits
- Expenditure reporting and cashflow management within ring-fenced cost centres
- Monthly update of Green Drop System and eWQMS
- SLA management of KPIs and redressing deviations therefrom
- O&M schedules and rosters and record of completion and sign-off
- Spillages and incident reporting
- Flow and quality monitoring programmes

- Access to treatment plants with logbook control
- SLA arrangement with AW for the O&M of bulk wastewater services
- Training and capacity building initiatives
- Recruitment drive to appoint wastewater staff

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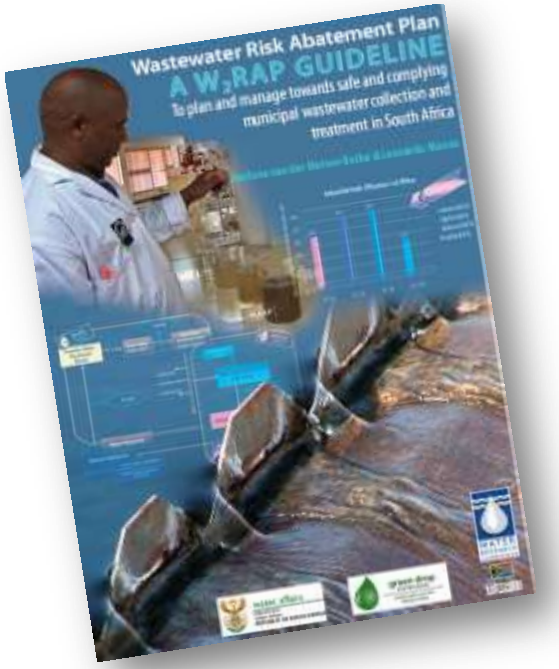

	YES	NO
1. Has a multi-disciplinary team of experts been assembled to carry out the W_2RAP development?	■	□
2. Has the team been informed of their duties and commitment?	■	□
3. Has the wastewater treatment system been described? (i.e. has each step in the system been considered for range and magnitude of hazards that may be present, and the ability of existing processes and infrastructure to manage actual or potential risk)	■	□
4. Following the description of the system above, has all the information been documented on three levels: catchment, collection and treatment?	■	□
5. Has the system been assessed and a flow diagram constructed?	■	□
6. Has the flow diagram been further developed to allow for flow and quality in-, during-, and out of the plant?	■	□
7. Have these hazards been identified and prioritised using the hazard assessment matrix provided?	■	□
8. Are there critical control points and control measures in place to reduce the identified hazards?	■	□

green drop
CERTIFICATION
waste water service
REGULATION

Q & A?

water affairs
Department:
Water Affairs
REPUBLIC OF SOUTH AFRICA