



HACCP in Water: “The War on Error”.

David Smith

Product Quality Coordinator

Gold Coast Water

Gold Coast City

Australia



Where is Gold Coast City ?



Source: www.gold-coast.net

Sun, Sand & Surf



Source: www.gold-coast.net

Statistics for Gold Coast

- Population: 470,000 growing at 5%
- Topography: background hills falling to floodplain and beaches
- Average Temperatures:
 - Summer - min 70 max 85
 - Autumn - min 60 max 75
 - Winter - min 50 max 69
 - Spring - min 60 max 77
- Annual Rainfall: 60 inches

Background Information

- Gold Coast has two water sources. (Hinze Dam 80%; purchase from Brisbane 20%)
- Two Water Plants (Molendinar & Mudgeeraba)
- 74 suburban water storage reservoirs.
- Four Wastewater Plants.
- Certified for ISO 9000, ISO14000 and HACCP

The Mission for Gold Coast Water

To constantly provide safe, high quality drinking water for the inhabitants of Gold Coast City.



The Home Team

- Product Quality Staff
- Catchment Staff
- Water Plant Operators
- Hydraulic Officers
- Samplers & Lab staff
- Call Centre Staff
- Field Staff
- Instrument Technicians

Enemies in the War On Error

- Entropy. The universal, spontaneous tendency towards disorder.
- The tendency for all bodies to seek the lowest possible energy state.
- The tendency for people to always seek the path of least resistance.
- The observation that people will always do the right thing...
when all other options have been exhausted.
- A supporting cast of bacteria, protozoans, corrosion, biofilm, DBP's etc., etc.

The Home Team's Weapons for Mass Consumption

A Catchment to Tap Water Quality Management System.

Featuring:

- The Multiple Barrier Approach
- ISO 9000
- Partnership for Safe Water
- HACCP
- Full compatibility with WHO Water Safety Plans and Australian "Framework" document.

The Battle Plan

(The Modified HACCP System)

- Define the level of quality and safety we seek.
- Construct a validated system process flow diagram (in person)
- Identify and assess risks to the overall mission and to the individual process components. (use correct skill base, no desktops)
- Understand and accept that some risks will be missed, and that risk changes.
- Design procedures to implement:
 - Monitoring, control, corrective action and reporting.
 - Ongoing and automatic risk updating.
 - Auditing and accountability.

Key Weapon #1

The Procedure.

- Procedures are the first step in blocking the path of least resistance.
- There is a procedure for each process step or significant risk.
- Each procedure is a formal instruction from the manager to the operational staff. (some include instruction to the manager).
- Most procedures explain the step, the risks, responsibilities, monitoring, control and corrective action.
- Appropriate procedures contain the HACCP critical Limits and the failure (“excursion”) reporting path.
- Many procedures contain prompts to guide auditors.
- Procedures are designed to implement and automatically update risks and risk mitigations as well as implement the HACCP plan.
- Procedures are few in number and mostly short (1-3 Pages).



Key Weapon #2

The HACCP Excursion Reporting System

- All Critical Limit failures must be reported to senior management within 24 hours.
- It is extremely difficult to conceal failure.
- Operational staff have an incentive to unite and avoid the need for excursions.
- Operational staff need no encouragement to report failures caused by poor equipment, bad planning, lack of training or resources.
- Senior Managers receive the emailed HACCP excursions whether they want to or not.
- Failing to read HACCP excursions is a risk that managers are highly unlikely to take.

The GCW HACCP Excursion form

HACCP EXCURSION - WATER/WASTEWATER

When form completed please e-mail to:

- Director GCW
- Managers GCW
- Product Quality Section
- Water / Wastewater Treatment Coordinator

Section A	Site:	Molendinar Water Treatment Plant		
	Date of Exceedance	6 March 2002		
	Time of Exceedance:	0140 hrs to 0530 hrs	*Duration:	3.8 hrs
	Reported By:	Tommy Fontana		
	Contact No:	Work: (07) 5581 7014 Mobile: 0414 180 870		
	Consequence of event:	<ul style="list-style-type: none"> • No consequence due to turbidity below 1 ntu, chlorine system remained functional and low bacto counts in the raw water. 		
	Suspected Cause/Reason for Storage:	<ul style="list-style-type: none"> • High filter turbidities - Polyelectrolyte batching sequence failure. 		
Actions Taken:	<ul style="list-style-type: none"> • Reduced raw water flow to plant to reduce load on filters, • Increased Alum dose, • Reset poly batching sequence, • Increased chlorine dose, • Tested sample from # 4 res. turbidity 0.34 ntu ,chlorine 0.98 mg/L, apparent colour 3.0 HU. 			

Section B -	Parameter/s Affected: Eg. pH, turbidity	Level of Specification Affected:	**Excursion Value:	Specification Value/s:
	Turbidity	Critical Limit	0.50 ntu	< 0.2 ntu
			
			
			

What is reportable in the modified HACCP System

- Certain changes in raw water quality (eg algae, bacto, Mn).
- Certain water plant problems with respect to recycled water, dosed water pH, turbidity, chlorine, Al, Mn, etc. .
- Failure to inspect a reservoir.
- Failures in distribution system sampling test results.
- Exceeding daily limits for customer complaints re: dirty water, taste/odour, illness related or “other”.

AUSTRALIAN FOOTBALL



Australian Football

The “screamer” or “speccy”



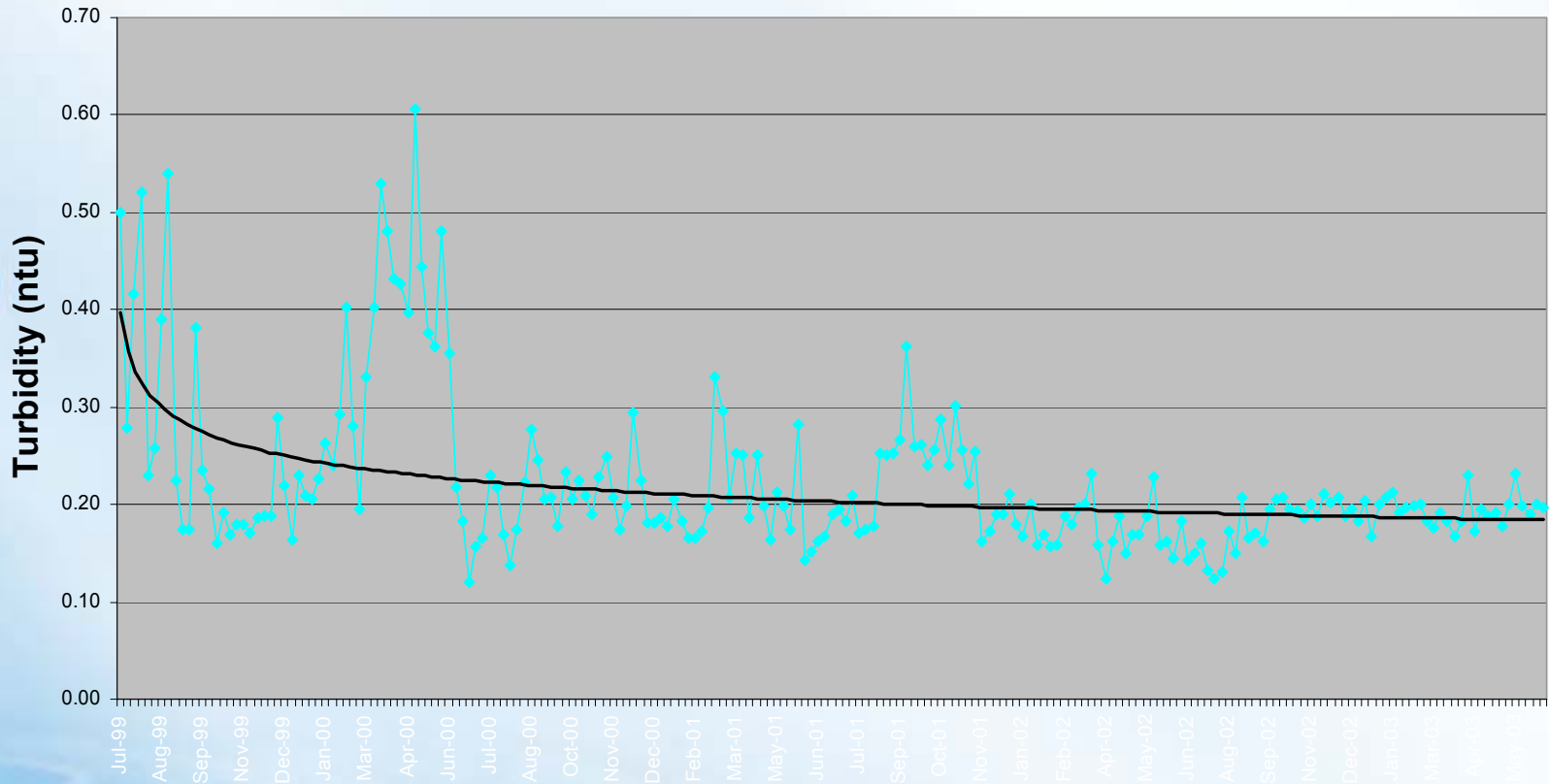
“Speccies”



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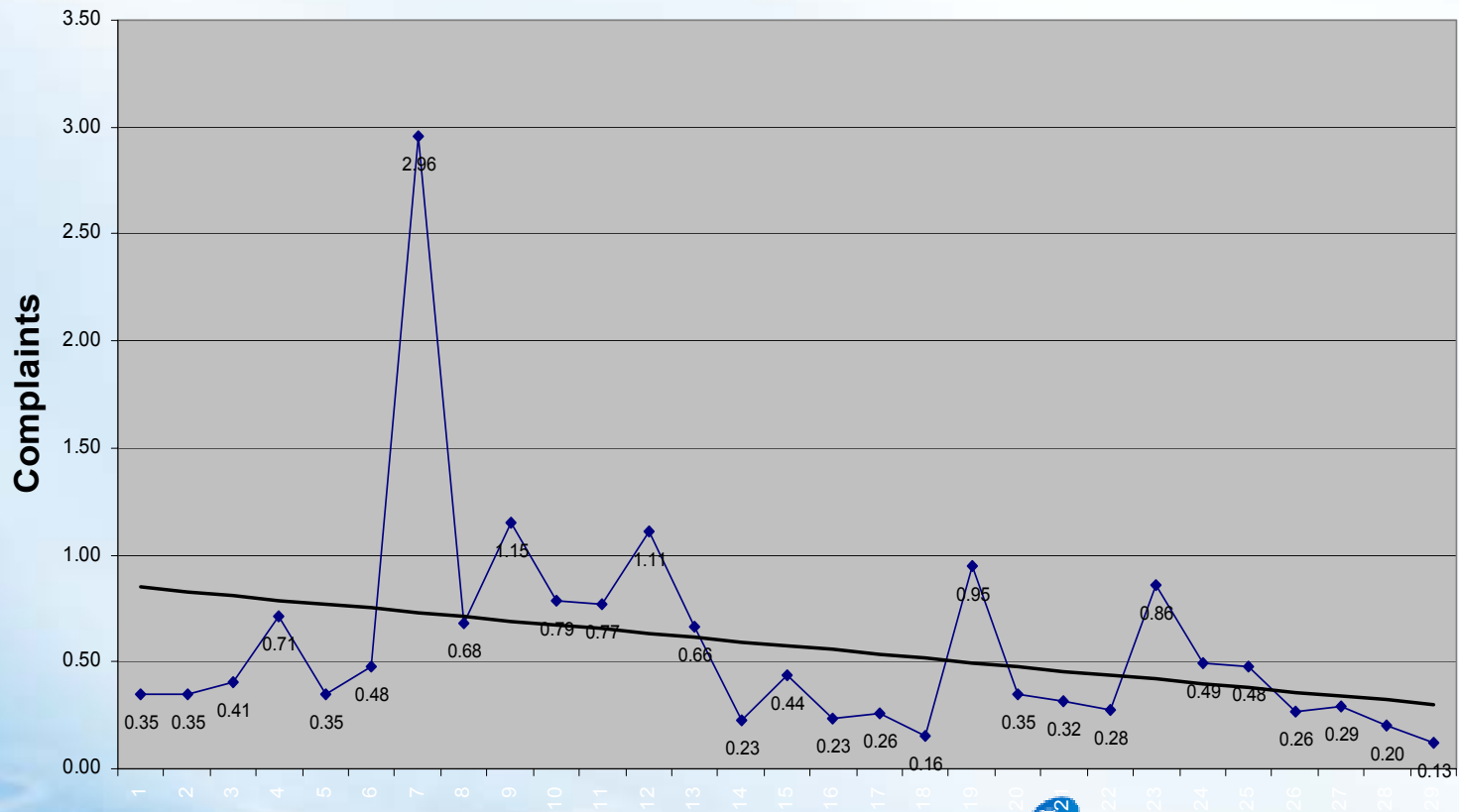
Does it work ?

Average Weekly Turbidity of Final Product Jul 1999 - Jun 2003



Does it work ? Part 2

Water Quality Complaints per 1000 properties
Jul 2001 - Nov 2003



Does it Work? Part 3

- Neither Operational staff nor management would consider returning to the previous “loose” regime.
- HACCP system auditing and excursion reporting has brought improvements into areas of asset management, staff training, budget allocations and infrastructure planning.
- System has been applied to wastewater plants with equal efficacy.

Why does it work?

- The HACCP procedures and reporting system effectively blocks the path of least resistance.
- Non-altruistic participants cooperate through self interest.
- Participants are manoeuvred into providing the energy to overcome their own entropic tendencies.
- Constantly updates risk and drives continuous improvement.
- Provides clear evidence of “due diligence”.

Benefits to Regulators

- Regulator can have access to performance figures that are close to “real time” and “representative”.
- Regulator can see circumstances that mitigate apparently “poor” results.
- Utility no longer forced to “jump at shadows”.
- Regulators can specify that utility must implement the “elements” of the system.
- The utility is boxed in. It must have the system elements. The elements make concealment difficult.
- Regulators can either act against poor results or loss of system integrity.

FAQ's

Q. Is the system costly?

A. No extra operational staff required. Possibly some instrumentation. Possibly 1 or 2 administrators (HACCP champions) required in larger utilities. Testing may be increased or decreased.

Q. Is it effective in small poorly resourced areas?

A. The system actually provides greater relative gains in places where the risks are higher and the resources lower.

FAQ's

Q. How long does it take to design a system.

A. In a catchment, plant or reticulation system with no serious process flaws, design and implementation can take 4-6 weeks. The subsequent culture change will take 6 months or more.

Q. Why base the system on HACCP.

A. HACCP is an attractive vehicle to tie all the features together. It has a well defined, simple and relevant structure. It is certifiable and well known. Provides an effective rallying point.

FAQ's

Q. Isn't it a lot of extra work?

A. It is not extra work. It IS the work (attr. to Bill Lauer AWWA)

There is abundant evidence to show that rather than do more work, staff are more particular about the work they do carry out.

Q. What can go wrong?

A. Using people with inadequate skills will proportionally limit the efficacy of the system. A lack of commitment at senior level will limit (but not destroy) efficacy. Failing to appoint a properly qualified "guardian" or "champion" would be a serious error.



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