ROTORUA WASTEWATER PROJECT
ROTOITI & ROTOMA SEWERAGE PROJECT
GLOSSARY OF TERMS

This Issue 3 incorporates additional Terms to those in Issues No.1 and 2. These additional terms include a number of new technology types and that have been referred to in the project in terms of possible add-on's and also in terms of micro-pollutants that have also been discussed

$M	Million NZ dollars
Activated sludge	Activated sludge refers to the mass of microorganisms cultivated in the treatment process to break down organic matter and other inorganic compounds, including nutrients.
Adaptive Management	A systematic, iterative process of decision making in the face of uncertainty, with an aim of reducing uncertainty over time through system monitoring and changes to management in response to the results of monitoring. This approach can be used in setting resource consent conditions. "Trigger and response" or "adaptive management" conditions can provide more flexibility for consent holders and greater certainty for both the consent holder and the consenting authority.
Add-On's	The term adopted in the Rotorua Wastewater project for treatment technologies that could be "added-on" to the WWTP either initially or at some time in the future, to all or part of the otherwise treated wastewater volume to enhance the level of treatment for those contaminants being targeted. The "add-on's" are being separately reported on to the RPSC by TAG. Accordingly, trade names for various "add-on's" are not included in this glossary of terms. Earlier in this Project, the term "flagged options" was used. This has now been superseded by the term "add-on's".
ADF	Average daily flow (of wastewater). The ADF for Rotorua is around 20,000 m^3/day
Advanced Oxidation (also referred to UV-Photolysis and UV-Oxidation)	Exposes the water to ultraviolet light combined with hydrogen peroxide to eliminate remaining organic compound traces. The UV intensity is around 300 times that of the sun's rays. Also referred to UV-photolysis and UV-oxidation is a photo-chemical process that breaks down organic constituents in water by the process of oxidation initiated by UV light plus an oxidant such as hydrogen peroxide. When UV photons are absorbed by hydrogen peroxide dissolve in water, hydroxyl radicals are formed. Hydroxyl radicals are highly reactive and attach contaminant molecules, breaking them into their component forms.
ADWF	Average dry weather flow.
Algae	Simple chlorophyll-bearing cells. Most are aquatic and unicellular. Some may link to form colonies or filaments and become macroscopic. An evolutionary early form of plants.
Alum	Aluminum sulphate. A chemical used to efficiently react with P and DRP, which then settles and is called an alum-sludge, not available to plants and algae.
Ammonia Nitrogen	NH_4-N, the fraction of the ammonia that is nitrogen.
ANZECC	Australian and New Zealand Environment and Conservation Council.

Assessment of Effects on the Environment (AEE)	Assessment of Effects on the Environment. The document required under the Resource Management Act to support new Resource Consents applications.
Auckland Council, TP10	An Auckland Council document setting out storm water devices
AWT	Consultants now Mott MacDonald – involved in the technical studies for this project.
Bardenpho	The Biological Nutrient removal treatment process as installed at the Rotorua Treatment Plant which treats approximately two thirds of the present wastewater flow. Installed in 1990.
Best Practicable Option (BPO)	In terms of the Resource Management Act 1991 – "in relation to a discharge of a contaminant or an emission of noise, means the best method for preventing or minimising the adverse effects on the environment having regard, among other things, to: The nature of the discharge or emission and the sensitivity of the receiving environment to adverse effects; The financial implications, and the effects on the environment, of that option when compared with other options; and The current state of technical knowledge and the likelihood that the option can be successfully applied."
Biological Nutrient Removal (BNR)	Biological Nutrient Removal (biological nitrogen and phosphorus removal) is a wastewater treatment process that cultivates a live population of naturally occurring micro-organisms to breakdown organic matter and other inorganic compounds.
Biochemical Oxygen Demand (BOD, $cBOD_5$)	Carbonaceous biochemical oxygen demand ($cBOD_5$) measured as 5 day standard test. It is a measure of organic matter or organic strength of the water, reported as the mass of oxygen consumed per L of water (mg/L). A quicker measure of the organic strength is COD, which is measured through chemical oxygen. The COD in urban wastewater is roughly twice the BOD.
Biomass	The weight of living matter, eg of bacteria, algae, plant or animal. In wastewater treatment the biomass is the population of organisms that treat the wastewater. It is often referred to as 'mixed liquor', and expressed as the concentration of solids in the mixed liquor 'MLSS'.
Biosolids	Sludge from a wastewater treatment plant or unit that has been treated or stabilised.
Biota	Any assemblage of living organisms in a specific area
BioWin Models	A computer modeling tool used to assess wastewater treatment plant process operations.
Blackwater	Wastewater containing human waste. Although kitchen water is not technically blackwater, it is often separated from greywater and combined with blackwater for treatment, because it can contain significant quantities of organic waste.
BOPRC or BoPRC	The Bay of Plenty Regional Council is responsible for (among other things) managing the effects of using freshwater, land, air and coastal waters.
Buffer zone	We use to refer specifically to the unirrigated area between a spray-block and an area of either main public access or with a direct connection to a waterway discharging to lake Rotorua. Also used for the zone between a Wastewater Treatment Plant and an environmental or odour compliance zone is established around.
CAPEX	The abbreviated term for Capital cost – that is the cost to design and

	build infrastructure.
Carbon (C)	Carbon, carbon compounds provide chemical energy for growth and development and form the basis of organic life.
Carbon-dosing	Refers to the carbon provided as a food source to the organisms that remove nitrogen. Rotorua adds ethanol, a byproduct from the dairy industry.
cfu/100ml	A measure of colony forming units (of micro-organisms) per 100ml of liquid sample.
Chlorination	The disinfection of wastewater using chlorine chemicals.
Clarifier	A settling tank in which fine solids, usually measured as suspended solids, settle to the base of the tank to be removed, and the water flows out over the top. Settling can aided by the addition of chemicals such as alum.
Cluster Wastewater System	A wastewater collection and treatment system where two or more dwellings, but less than an entire community, are served. The wastewater from each group of dwellings may be treated on-site by individual septic tanks before the septic tank effluent is transported through alternative sewer systems to a nearby off-site location for further treatment and ecosystem re-entry. In other situations the full wastewater flow from each group of dwellings may be reticulated off-site to a local treatment and ecosystem re-entry location.
CNI	CNI Iwi Holdings Limited - owners of the land where the LTS is located.
Coagulation	Coagulation / Flocculation. Treatment process to precipitate phosphorous and flocculate the solids, usually undertaken in a chemical clarifier.
COD	Chemical Oxygen Demand being a measure of the organic strength of the waste, measured chemically.
Composting toilet	Toilet in which human waste is collected, stored and biologically degraded, using little or no water.
Contaminant	In terms of the RMA, " includes any substance (including gases, liquids, solids, and micro-organisms) or energy (excluding noise) or heat, that either by itself or in combination with the same, similar, or other substances, energy, or heat – a) When discharged into water, changes or is likely to change the physical, chemical, or biological condition of water; or b) When discharged onto or into land or into air, changes or is likely to change the physical, chemical, or biological condition of the land or air onto or into which it is discharged".
Cumecs	Cubic metres per second (m^3/sec)– a flow rate for river and / or wastewater flow
Cumulative Effects	Effects arising over time; and effects arising in combination with other effects. Any one incremental change may be insignificant in itself but at some point in time or space the accumulation of insignificant effects becomes significant.
Cyanobacteria	Filamentous bacteria containing chlorophyll and capable of full autotrophy (capable of making nutrients from inorganic materials). Previously grouped with the algae, but now recognised as a distinct group of organisms more closely related to bacteria.
Denitrification	A biological process in which nitrates are reduced to nitrogen gas.
DIN	Dissolved Inorganic Nitrogen = ammonia nitrogen + nitrate nitrogen +

	nitrite nitrogen.
Discharge to land	A discharge that flows onto or into land.
Discharge to water	A discharge that flows into surface water, either directly or indirectly.
Discharge to water mixing zone	A discharge to groundwater or hyporheic water (saturated sediments, the flow that transitions between groundwater and surface waters). There is the potential for additional nutrient removal.
Discharge water	The discharge, effluent, treated water, outflow AFTER treatment at WWTP. Rotorua's discharge water is currently irrigated onto Whakarewarewa Forest. We are looking for an alternative option for this discharge.
Disk Filter	A mechanical treatment filtration device using disks of woven fabric to remove total suspended solids (TSS). Filter mesh size range often 10-100 micrometres (micron).
DO	Dissolved Oxygen.
Domestic wastewater	Wastewater originating from residential dwellings, from: toilets, urinals, kitchens, bathrooms, showers, baths, basins, laundries. It excludes wastewater from commercial laundries, schools, cafes and restaurants, tradewaste and commercial waste. It excludes rainwater or stormwater.
DON	Dissolved Organic Nitrogen = total dissolved nitrogen – dissolved inorganic nitrogen. Typically around 80% of TP in domestic wastewater.
DRP	Dissolved Reactive Phosphorus.
DWF	Dry weather flow of wastewater in Rotorua is around 16,000 cubic metres, which is around 215 L per person per day from Rotorua citizens and visitors. This is 'normal' for NZ.
E. coli	Escherichia Coli, a species of bacterium normally present in the intestinal tract of humans and other animals. It is widely used as an indicator of faecal contamination, ie it is an indicator micro-organism for other pathogenic micro-organisms.
Ecosystem	Communities of interacting organisms in conjunction with the physical environment, interacting as a system. Therefore by definition, humans and their built environment are not separate from, but are interdependent and integral parts of ecosystems.
Ecosystem Re-entry	The re-entry by one or other methods of discharge of the final treated wastewater into the ecosystem.
Effect	"Effect means – In this Act (RMA 1991), unless the context otherwise requires, the term "effect" includes: a) Any positive or adverse effect b) Any temporary or permanent effect; c) Any past, present or future effect; d) Any cumulative effect which arises over time or in combination with other effects – regardless of the scale, intensity, duration, or frequency of the effect, and also includes – e) Any potential effect of high probability f) Any potential effect of low probability which has a high potential impact."
Effluent	The water that leaves a system or treatment plant – as opposed to influent, the water that enters. Effluent is often considered an old fashioned word and treated wastewater or discharge water are often

	used instead.
Endocrine Disrupting Chemicals (EDC)	Endocrine disrupting chemicals are one important family of micro-contaminants that are cause for concern because of their potential to disrupt endocrine functions in wildlife and human population. EDCs have been defined as "exogenous substances that causes adverse health\effects an intact organism, or its progeny, secondary to endocrine functions" (European Commission 1996). While sewage effluents can contain EDCs, a local study investigating the fate of estrogenic and androgenic activities in New Zealand and Australia sewage treatment plants found that secondary WWTPs ()and particularly activated sludge treatment) removed up to 99% of the estrogenic and androgenic activity originally present with influents (Leusch et al 2006a). Reference to the Cawthron Institute Report No. 2363, June 2013 covers EDC testing on the Rotorua WWTP and receiving environments. EDC's are a sub-set of trace organic compounds (TOrC) – refer that term in this glossary.
Environment	Environment, in terms of the Resource Management Act 1991, includes – (a) Ecosystems and their constituent parts, including people and communities; and (b) All natural and physical resources; and (c) Amenity values; and (d) The social, economic, aesthetic, and cultural conditions which affect the matters stated in paragraphs (a) to (c) of this definition or which are affected by those matters."
EPA	USA – environmental protection agency
Ethanol	A chemical carbon source used as supplementary carbon for denitrification in the biological treatment process. Currently used at the Rotorua WWTP.
Ethanol	An alcohol, used as a supplementary source of carbon for denitrification (N-removal) in the WWTP. It is expensive byproduct from the dairy industry.
Faecal Coliform (FC)	Faecal coliform (FC) are bacteria. Their presence may indicate that the water has been contaminated with faecal material from of humans or other animals. Like E.coli this bacteria is used as an indicator micro-organism for other micro-organisms.
Ferric	A form of iron used to react with P. Naturally abundant in the environment, brown, like in soda springs.
Filtration	A process to remove solids from water.
Flocculation	Flocculation / Coagulation. Treatment process to precipitate phosphorous and flocculate the solids usually undertaken in a chemical clarifier.
g/m^3 = mg/L = ppm	Common units for expressing concentration. The mass in a specified volume such as grams per cubic metre, milligrams per litre, or parts per million.
Greywater	Wastewater from the bathroom, laundry and kitchen*. It can contain fats, grease, organic matter, nutrients, and pathogens. It does not include blackwater (water that contains human waste). *Kitchen water can contain significant quantities of organic waste. It will generally be separated from a greywater re-use system and treated with the blackwater. Because of this, kitchen water is sometimes not included in definitions of greywater.

Gabion Baskets	A Basket of rocks retained in a wire mesh, or similar basket
Geological and Nuclear Sciences (GNS)	GNS is a New Zealand Crown Research Institute. It focuses on geology, geophysics (including seismology and volcanology), and nuclear science (particularly ion-beam technologies, isotope science and carbon dating).
Grinder Pump	Grinder pumps are used to collect and convey wastewater from properties. The grinder pump grinds up solids entering the pump, and the resulting liquid slurry is pumped to a low pressure reticulation system.
Hapu	
Hectares (ha)	1 Hectare = 10,000 m^2
HUE	Household Unit Equivalent is a measure a Council uses to establish a typical household demand for water use or wastewater discharge. Base unit demands and non-residential HUE conversions. RDC Engineering Design Standards: HUE = 0.9 m^3/household/day water supply HUE = 0.66 m^3/household/day wastewater Alternatively: Average residential dwelling = 2.7 person; NZS:4404 Average typical water demand = 250 L /person/day; NZS:4404 Average typical wastewater generated = 200 L /person/day; HUE = 0.675 m^3/household/day water supply HUE = 0.540 m^3/household/day wastewater
Inflow and Infiltration (I and I)	Inflow and infiltration is the extraneous water entering a reticulation system. Inflow is water entering via a deliberate connection (downspouts, gully traps, manholes, etc. Infiltration is water entering from the ground. RDC has an ongoing programme to reduce I and I.
Indicator micro organisms	The bacteria (E.Coli, faecal coliforms and enterococci) that are used to indicate the possible presence of pathogens (disease causing microorganisms).
Infiltration (reticulation system)	Infiltration is groundwater entering the sewerage system.
Infiltration rate (soil)	Infiltration is the process by which water on the surface of the soil enters the soil. Infiltration rate is the rate that soil can absorb water (mm/hr). The rate decreases as the soil becomes saturated. It is related to the characteristics of the soil.
Inflow	Inflow is water entering via a deliberate connection (downspouts, gully traps, manholes, etc.
Influent	The water that enters a system or treatment plant– as opposed to effluent, the water that leaves a system or treatment plant.
L	Litre is a metric unit of volume. 1L = 1000 millilitres (ml)
Landcare Research	A crown research organization involved in environmental research organisation specialising in sustainable management of land resources optimising primary production, enhancing biodiversity
L/s	Litres per second, a flow rate.
Land Treatment	The application of appropriately (pre) treated wastewater at a controlled rate, into or onto land. The purpose to either obtain beneficial use of the wastewater and its constituents, for improved environmental outcomes, or to achieve treatment goals. The principle

	land treatment processes are Slow Rate (SR), Overland Flow (OF), Rapid Infiltration (RI).
Land Treatment System (LTS)	The Rotorua District Council's land application system established in 1991 in the Whakarewarewa Forest
m	Metre, a measure of length.
m^3	Cubic metres, a measure of volume.
m^3/day	Cubic metres per day, a measure of the daily flow rate
m^3/sec	Cubic metres per second, a measure of flow rate – also referred to as cumecs.
Mass Load	The mass in tonnes or kilograms of a compound or other material. In this project the mass load of TN and TP are important considerations. The units are often given as tonnes per annum.
Mauri	The Te Reo word that refers to the life-force, spiritual energy, or portion of the universal energy that is associated with, and connects with, the material/physical aspect of this world.
Membrane Bioreactor	High degree of biological and filtration treatment as introduced into the RDC WWTP in 2012 to cater for approximately one third of the total wastewater flow being treated. The RDC MBR at the WWTP has a pore size in the membranes of 4 microns.
MDF	Median daily flow – relating to wastewater flow
Membrane Filtration	An advanced tertiary polishing step using microfiltration to remove (all) suspended solids and some colloidal material
MfE	Ministry for the Environment
mg/L	Milligrams per litre is a concentration measure of a contaminant in liquid, is the same as mg/L is the same as g/m^3 and is in effect the same as parts per million (ppm)
mg/m^3	Milligrams per cubic metre which is the same as 0.001 mg/L per litre.
mgN/L	Milligrams of Nitrogen per litre
Microfiltration	Involves passing wastewater through very fine hollow fibre membranes 0.1 to 0.4 microns (same as a micrometer) in size (human hair ranges in size from 20 to 200 microns, in diameter) that remove particulate matter, protozoa and some viruses. After passing through the membrane, the filtered water mostly contains dissolved salt and organic molecules.
Micron = Micrometre	1 millionth of a metre (10^{-6} metre)
ML/day	Million Meters per day
MoH	Ministry of Health
MWH	Consultants involved in the project through their staff representation on the TAG and facilitator to the RPSC
N	Nitrogen, one of the main nutrients used by plants and algae to grow
NA or N/A	Not Applicable
Natural Character	In terms of the Resource Management Act 1991 – means "the qualities of the environment that give recognisable character to an area. These qualities may be ecological, physical, spiritual, cultural or aesthetic in nature. They include modified and managed environs."
ng/L	Nanogram per litre, parts per trillion. Equal to 0.000001 mg/L or 0.0001 µg/L.
NH_3	Ammonia.
NH_4 - N	Ammoniacal – nitrogen.
Nitrate & Nitrite	Nitrate (NO_3) and nitrite (NO_2) are oxidation states of nitrogen. In order of decreasing oxidation state: nitrate, nitrite, ammonia, and

	organic nitrogen.
Nitrification	A biological process in which ammonia is converted first to nitrite (by specific bacteria) and then to nitrate (by specific bacteria).
Nitrogen	N, one of the main nutrients used by plants and algae to grow.
Nitrogen renovation	Removing nitrogen from water. We transform the nitrogen in sewage to ammonia (not very mobile through soil, not good for aquatic life and like a fertiliser for plants) then to nitrate (very mobile in the soil and a fertiliser for plants) and ultimately nitrogen gas (harmless). There will always be some residual N that cannot be converted. It is dissolved organic N, not harmful to aquatic life, somewhat mobile in soils, not very available to plants.
NIWA	National Institute of Water and Atmospheric – a New Zealand Crown Research Institute.
Non-Separable	The term used for industrial wastewater that is discharged into domestic and non-separable industrial system that is not discharged into the industrial wastewater system.
NPV	Nett Present Value – made up of capital costs and annual operating and maintenance cost over a set time period at stated discount rates.
NTF	Nitrifying Trickling Filter is an aerobic treatment process in which partially treated wastewater flows across a bed of highly permeable media to nitrify the wastewater, that is to convert the ammonia to nitrates.
Nutrients	Organic or inorganic chemicals needed by organisms for growth and reproduction. In this and most projects, the principle nutrients are the various forms of nitrogen and phosphorus.
O & M	Operation and Maintenance. Also called OPEX
OPEX	The Abbreviation for operation and maintenance costs – costs usually given on a per annum basis. Care is needed as to whether depreciation allowances in accordance with local government procedures are included.
OSET	On-Site Effluent Treatment. A small-scale domestic wastewater treatment system comprising the technologies and management protocols for the handling of household wastewater within the property boundaries of the place of origin of the wastewater, including processing and re-entry to the in-boundary environment.
OSET - AWTS	OSET Aerated Wastewater Treatment System.
OSET - AWTS + NR	OSET Aerated Wastewater Treatment System + Nutrient Removal.
OSET - NTF	OSET National Testing Facility (for NZ). It is located at Rotorua WWTP, and tests the performance of OSET systems under the same conditions. The Bay of Plenty Regional Council rules state that only 'approved' OSET systems can be installed in some areas that are sensitive to nutrients.
P	Phosphorus, one of the main nutrients used by plants and algae to grow.
P & G	Preliminary and General – cost component.
P removal	Phosphorus can be removed from wastewater biologically to relatively low concentration, where the P is taken up by the microorganisms that are cultivated and removed as sludge. Compounds can be added to remove dissolved-P to very low concentrations by precipitation and flocculation, and the solids formed are removed. Both of these processes are common in WWTPS

	as a continuous or batch process. P can also be held by reactive surfaces of a range of materials, including soils, and these can be used in beds and trenches for example to remove any DRP remaining after treatment. The capacity to retain P is finite and adsorbed P can be released under some conditions. Particulate-P can be removed by different types of filtration.
Package Plant	A factory-assembled wastewater treatment plant, generally to treat wastewater from a home, such as an OSET AWTS, but they can be larger and also treat tradewaste.
Pathogens	Disease causing microorganisms.
PDWF	Peak Dry Weather Flow for wastewater flows in litres per second or cubic metres per second (cumecs).
PE and PL	PE, Population equivalent, is the wastewater from inhabitants, expressed as water volume or BOD. The 2 definitions used worldwide that are based on fixed non-changeable values are: 1 PE = 0.2 m^3/d; or 1 PE = 60 g BOD/d. PL, person load, is the actual contribution of wastewater from a person (which varies).
Peak Demand	For engineering type assets such as roading, water and wastewater networks and infrastructure the extra demand can be calculated based on peak requirements in such periods as holidays, major conferences etc. The peak demand is taken as 100% occupancy of all accommodation and infrastructure and assets are sized accordingly.
Percentile	Division of a frequency distribution into one hundredths.
Permeability (soil)	The capacity of the soil to allow water to pass through it.
PF	Peak Flow on an hourly basis (m^3/h).
pH	Measure of acid or base nature of liquid.
Phosphorus	P, one of the main nutrients used by plants and algae to grow.
Photosynthesis	The process where starches and sugars are produced within plant (or plant - like) cells using carbon dioxide, inorganic nutrients and sunlight. Sunlight is captured with the chlorophyll molecules.
Predicted No Effect Concentration (PNEC)	The European Union's predicted no effect concentration (PNEC) is the estimated concentration below which exposure to a substance is not expected to cause adverse effects in the receiving water environment. For the Rotorua WWTP the Cawthron Report No. 2363 June 2013 sets out PNEC levels for the receiving water environment.
P-stripping	Removal of P by adding compounds to precipitate and flocculate with the dissolved P.
PWWF	Peak Wet Weather Flow.
Rapid Infiltration Beds (RIB's)	A high porous soil type structure into which treated wastewater is discharged from which it infiltrates away quickly. Often RIB's are constructed in the form of a series of open basins.
RDC	Rotorua District Council is one of 7 territorial authorities in the BOPRC region. RDC is responsible for (among other things) controlling the effects of land use and the effects of activities on the surface of lakes and rivers (managing the effects is a Regional Council responsibility); providing local infrastructure, including water, stormwater and sewerage (as required).
Receiving Environment	The natural environment into which a discharge is made.
Residuals	The by-products of wastewater treatment (other than the treated

	water). These include screenings, sludges, biosolids, grit, grease, fat, air emissions including odour.
Residual Aluminum	The Residual or left over proportion of Aluminum chemical (as Al) in the treatment of the wastewater after Alum (Aluminum Sulphate) treatment
Resource Consent (Discharge Permit)	A resource consent is the authorization given to certain activities or uses of natural and physical resources required under the RMA.
Reticulation	A network of pipes and pumps etc used to transport wastewater. Stormwater (rain) is also reticulated separately. Reticulation systems are made up of collection and conveyance systems.
Reverse Osmosis (RO)	Reverse osmosis is a common process to remove salt and other dissolved substances from water. Reverse osmosis works by forcing water through a special plastic, semi-permeable membrane sheet to remove compounds such as dissolved salt, dissolved organic compounds, micro-organisms and viruses. Reverse osmosis is used to purify water and to desalinate seawater. To push water through the membrane, it requires pressure to overcome the natural phenomenon of osmosis. Osmosis is a natural physical phenomenon in which water moves across a natural membrane (like a leaf, the root wall of a plant, or human skin) from an area with less salt to an area with more salt. With reverse osmosis, we are literally reversing this process, and to reverse a natural process we need to apply pressure.
Reynolds Number	In fluid mechanics, the Reynolds number (Re) is a dimensionless quantity that is used to help predict similar flow patterns in different fluid flow situations
RGF	Rapid Gravity Filter – a sand, gravel or other media or mixed media filter bed to remove suspended solids by passing the wastewater through the media
Riparian zone	The edge of a wetland or stream
Rock Passage	A passage, or bed or broad wall of rocks over and or through which treated wastewater discharges before entering the water receiving environment – through ecosystem re-entry.
RMA	Resource Management Act 1991 and subsequent amendments
Rohe	Boundary, district, region, territory, area, border (of land).
Rotorua LTS	Land Treatment System in Whakarewarewa Forest, it is Slow-Rate (SR) application by spray-irrigation.
RPS	Bay of Plenty Regional Council's Regional Policy Statement
RPSC	Rotorua Project Steering Committee (also called the Rotorua Land Treatment System) - the Project involving investigations, planning and consultation for the future disposal discharge or reuse of Rotorua's treated wastewater.
RRSSC	Rotoiti Rotoma Sewerage Scheme Committee Project.
SAE	Significant Adverse Effects – as it relates to the River quality.
Sanitary Works Subsidy Scheme (SWSS)	Central governments sanitary subsidy scheme for small communities. As available from the Ministry of Health for the implementation of a Rotoma Community Wastewater Scheme
Saturated (soil)	A soil is saturated when relatively all the pores (space) and fractures are filled with water (rather than air).
Sewage (interchangeable with wastewater)	The water-carried waste that leaves a house or community.

Sewerage System (wastewater reticulation system)	The infrastructure (system of pipes, fittings, pump stations, manholes etc) for collecting and conveying the sewage.
SS	Suspended Solids (SS) equals Total Suspended Solids (SS=TSS)
Stormflow	Refers to the wastewater entering the WWTP during a storm. It is sewage diluted with rainwater. It can double the daily volume received in Rotorua during an intense storm, which is low compared to other cities, because we have an ongoing 'I and I' programme.
Suspended Solids (SS)	Suspended Solids (SS) equals Total Suspended Solids (SS=TSS)
t	Tonne = 1000 kg
Tangata whenua	In terms of the Resource Management Act 1991 – means "in relation to a particular area, means the iwi, or hapu, that holds mana whenua over that area."
Tapu	To be sacred, prohibited, restricted, set apart, forbidden.
TBA	To Be Advised
TBC	To Be Confirmed
TDP	Total dissolved phosphorus
Technical Advisory Group (TAG)	The Technical Advisory Group(s) established by RDC and both RPSC and RRSC for these two Rotorua Projects.
TERAX™	The TERAX™ (patented) hydrothermal deconstruction technology, which involves Crown Research Institute Scion and the Rotorua District Council, is testing a new approach to organic waste management. A pilot plant has been established at Rotorua's WWTP. This technology hydro thermally deconstructs or "cooks" sewage, sludges and biosolids and breaks the down into valuable products which includes a carbon source that can be used at the WWTP, biofuels, bioenergies, fertilisers or for electricity production.
TF	Trickling Filter is an aerobic treatment process in which wastewater flows across a bed of highly permeable media for carbon oxidation and nitrification.
Total K Nitrogen (TKN)	Total Kjeldahl Nitrogen
Total Nitrogen (TN)	Total Nitrogen = Total Organic Nitrogen + Ammonia + Nitrate + Nitrite
Total Phosphorus (TP)	Total Phosphorus – all Phosphorus compounds
Total Suspended Solids (TSS)	Fine solids in wastewater, determined by a standard test (TSS=SS)
Trace Organic Compounds (TOrC)	There is increasing interest in evaluating the occurrence and removal of trace organic compounds (TOrC) during wastewater treatment and water reclamation, because of concerns related to potential adverse public and aquatic health effects. TOrC present in municipal wastewater influents and effluents contain thousands of chemicals, which comprise of pharmaceuticals, personal care products, food additives and other high product volume (HPV) chemicals covering a wide range of physical and chemical properties. As we can only monitor a very small fraction of all TOrC that are present in wastewater, strategies are needed to describe ad predict removal efficiencies for a representative number of TOrC. Endocrine Disrupting Chemicals (EDC) are a sub-set of trace organic compounds (TOrC) – refer that term in this glossary.
Tradewaste	Tradewaste is wastewater from trade or industrial processes that is discharged into the sewer.

Tradewaste ByLaw	This refers to Rotorua District Council's Water Serves and Trade Waste ByLaw 2010. This bylaw sets out the procedures for Council to accept, or not tradewaste under certain conditions from tradewaste (industrial premises).
Treated wastewater	The water discharged after wastewater has been treatment. Depending on the quality of the water, it can be reused, or re-enter the ecosystem. It is also called effluent.
Trickling Filter	An aerobic, fixed-film treatment process in which wastewater flows across a bed of highly permeable media on which the biological treatment action takes place. In Hastings, Gisborne and Napier the term Biological Trickling Filter (BTF) is used to emphasise that the this is a biological treatment process.
Ultrafiltration (UF)	Is a variety of membrane filtration in which forces like pressure or concentration gradients lead to a separation through a semipermeable membrane. Suspended solids and solutes of high molecular weight are retained in the so-called retentate, while water and low molecular weight solutes pass through the membrane in the permeate. This separation process is used in industry and research for purifying and concentrating macromolecular (10^3 - 10^6 Da) solutions, especially protein solutions. Ultrafiltration is not fundamentally different from microfiltration. Both of these separate based on size exclusion or particle capture. Ultrafiltration membranes are defined by the molecular weight cut-off (MWCO) of the membrane used. Ultrafiltration is applied in cross-flow or dead-end mode. The pore size typically attributed to ultrafiltration range is between 0.007 and 0.13 microns. With 0.025 micron being one of the smallest virus sizes, the ultrafiltration is effective at removing viruses. Ultrafiltration is typically used along with other processes e.g. advanced oxidation before Reverse Osmosis (RO) in the advanced treatment train to produce treated water of drinking water quality.
UV	Ultra violet light irradiation used as a wastewater disinfection process.
UV Dose Rate	UV dose is measured in millijoules seconds per cm2 (mJ/cm2)
UV Transmissitivity (UVT)	Ultra-Violet Transmittance – a measure of the clarity and other characteristics of water (treated wastewater in this project) in terms of the effectiveness of Ultra-Violet light disinfection – this has a termination on UV dose rate to achieve predetermined microorganism kill rates.
VSB	Vegetated submerged bed – an ecosystem re-entry arrangement involving a submerged bed with vegetation.
Wastewater	The mix of domestic sewage and tradewaste. It can also include some rainwater and ground water that can enter the reticulation system during rainfall and/or areas with damaged pipes and a high water-table.
Water Quality	The chemical and physical attributes of water such as turbidity, nitrogen and phosphorus concentrations, temperature and major ion concentrations.
Water Quality Target (TLI)	An objective or result for water quality towards which efforts are directed.

Water Table	The 'surface' of the water or ground that is saturated. It can vary.
Wetland	A land area saturated with water, either permanently or seasonally, such that it takes on the characteristics of a distinct ecosystem. Wetlands consist primarily of saturated soils dominated by anaerobic processes, and support aquatic rooted plants. Wetlands can play a number of roles in the environment, such as flood control, groundwater replenishment, water purification by nutrient retention and cycling, sediment traps, heavy metal uptake by plants. Wetlands can trap, precipitate, transform, recycle, and export many of the waterborne constituents. The function of most natural wetlands is not to manage wastewater, but constructed artificial wetlands allow control of the retention time, flow regimes, micro-biota, and flora etc) that can allow for further treatment of wastewater. The water chemistry of wetlands is primarily a result of geologic setting, water balance (relative proportions of inflow, outflow, and storage), quality of inflowing water, type of soils and vegetation, human activity and wildlife within or near the wetland. Generally, wetlands are more effective at removing suspended solids, total phosphorus, and ammonia during high-flow periods and more effective at removing nitrates at low-flow periods. This project considers a number of different wetland arrangements. It is important to understand the rational for each different arrangement and what it will achieve, and not achieve, taking into account, wetlands are natural systems.
WWTP	Wastewater Treatment Plant.