ENVIROKNOWLEDGE®

Training & Services Compendium

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Prepared for the Clients

By

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ENVIROKNOWLEDGE®

HIGH QUALITY RMA & ENVIRONMENTAL KNOWLEDGE TRANSFER

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High Quality ENVIROKNOWLEDGE® Services and Training Available Throughout the Year

This flyer is a collation of the ENVIROKNOWLEDGE services of which the main component is 2-day training (except for Nitrogen 3-days) which is available as client's in-house or externally at ENVIROKNOWLEDGE hosted venues in Hamilton, Christchurch, Dunedin and Wellington.

Contents of this Compendium

- Effective Wastewater Management under the RMA (Pages 3-6)
- Farm Environment Management under the RMA (Pages 7-10)
- Nitrogen in the Environment (Advanced) for Science Professionals (Pages 11-15)
- Effective Regional Council Consents Process under the RMA (Pages 16-19)
- Effective Regional Council Consents Monitoring under the RMA (Pages 20-23)
- How to access ENVIROKNOWLEDGE in-house and external training? (Pages 24)
- Other ENVIROKNOWELDEG Services (Page 25)
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1. Effective Wastewater and Discharge Management

This **2-day** training is also accessible to the District & City Council, industry and consultancy wastewater professionals. This short, inspiring but comprehensive training enables attendees to understand the science of a wide-ranging wastewater treatment systems and impacts of wastewater discharges and specific consents processes and monitoring under the RMA.

This training enables wastewater, consents, compliance, science and planning professionals to be self-sufficient in wide-ranging wastewater treatment systems' knowledge.

The training provides excellent foundation to reading and understanding the *exclusive* technically complex and comprehensive colour A4 size 144-page manual with illustrations and >55 references.

2-Day learning:

- Consent process- from application to decision & consent conditions
- Compliance monitoring – consents monitoring, enforcement
- Impacts of contaminants – BOD, faecal bacteria, nutrients, heavy metals
- Widely used biological wastewater treatment systems science
- Land treatment science
- Common treatment systems operation – activated sludge, trickling filter, membrane bioreactor, sequencing bioreactor, ponds
- Modern treatment technologies
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1. Introduction
2. RMA, Water Services Act and National Directions
    a. RMA general
    b. Water Services (Wastewater Environmental Performance Standards) Regulations 2025
        i. Biosolids
        ii. Overflows/bypasses
        iii. Wastewater discharges to water
        iv. Wastewater discharges to land
        v. Mixed discharges
    c. Discharges of contaminants under the RMA
        i. Freshwater
        ii. Land
        iii. Air
        iv. Coastal
    d. Wastewater structures
        i. River/Lake
        ii. Coastal
    e. National Policy Statement Freshwater Management
    f. National Environmental Standards
        i. Land
        ii. Water
        iii. Air
3. Consents management
        a. Consents and activities under the RMA
        b. Environment Court processing consents
        c. EPA processing consents
        d. Applications
        e. Pre-application process
        f. Further information requested and commissioning of report
        g. Public notification
        h. Limited notification
        i. Pre-hearing and mediation
        j. Hearing
        k. Decision
        l. Consent conditions
        m. RMA clock and timeframes
        n. Objections and appeals
        o. Consent commencements
        p. Consents lapses, cancellations and surrenders
        q. Consents renewals and compliance
        r. Emergency works under s330 of the Act
4. Cultural expectations management
    a. Te mana o te Wai
    b. Mātauranga Māori
    c. Te Ao Māori
    d. Statutory acknowledgement
5. Compliance management
    a. Consents monitoring
    b. Enforcement strategy
    c. Enforcement procedures
    d. How to identify offences correctly under the Act?
    e. Consent reviews

f. Warnings and infringement notices
g. Role of abatement notices
h. Role of enforcement orders
i. Understanding interim enforcement order
j. Can diversion be used as an enforcement tool?

6. Impacts of wastewater discharges on the environment
    a. Raw wastewater characteristics
        i. Municipal
        ii. Industrial
        iii. Septic tanks
        iv. Farm
    b. Impacts on surface water quality
        i. Nutrients
        ii. BOD
        iii. Suspended solids
        iv. Faecal bacteria
        v. Heavy metals and hazardous substances
        vi. Emerging contaminants
    c. Impacts on coastal environment
    d. Impacts on groundwater quality
    e. Impacts on air quality
        i. Odour
        ii. Aerosol
7. The science of wastewater treatment processes
    a. Basic principles
    b. Basic microbiology
        i. Energy and microbiology
        ii. Sources of microbial energy and carbon
        iii. Basics of microbial energy generation process
    c. Digestion
        i. Aerobic
        ii. Anaerobic
        iii. Urea to ammonium
        iv. Organic-N to ammonium
        v. Ammonium to organic under aerobic digestion
    d. Aeration to nitrify ammonium
    e. Denitrification to strip nitrate
    f. Secondary clarification
    g. Disinfection
        i. Chemical
        ii. UV
        iii. Membrane
    h. Contaminant treatment process summary
8. Common NZ wastewater treatment systems, how they work and optimising performance
    a. Waste stabilisation ponds
        i. Anaerobic ponds
        ii. Facultative ponds
        iii. Maturation ponds
    b. Farm oxidation ponds
    c. Activated sludge system
    d. Sequencing batch reactor
    e. Biofilm technologies
        i. Trickling filters

        ii. Packed bed reactors
    f. Membrane bioreactors (MBRs)
    g. Land treatment systems
        i. Land treatment of effluent
        ii. Biosolid application to land
    h. Land disposal systems
    i. Wetlands
        i. Constructed wetlands
        ii. Floating wetlands
9. Advancements and efficiencies in wastewater treatments
    a. Advanced P stripping and recovery
        i. Biological – Enhanced biological P removal (EBPR)
        ii. Chemical (precipitation) – Struvite formation
        iii. Chemical (adsorption) - BluePro™ reactive media filtration
    b. Bio-augmentation
    c. Biological de-ammonification (a method that saves substantial aeration cost while reducing ammoniacal-N levels and greenhouse gas (N_2O) emissions)
    d. Ammonia chemical stripping and recovery
    e. Biofuel and algal production
    f. Algal manipulation of waste stabilisation and maturation ponds and wetlands
    g. Moving bed bioreactors (MBBRs)
    h. Electrocoagulation
    i. Vermifiltration
    j. Other technologies
10. Aeration and aeration technologies
11. Systems malfunctions, causes and remedies
    a. Waste stabilisation ponds
    b. Trickling filters
    c. Water intrusions
    d. Leaky treatment or storage ponds
    e. System monitoring
12. Consents application information and conditions guidance
        a. Discharges to surface water
        b. Land treatment
        c. Land disposal
        d. Septic tanks
        e. Coastal discharges
        f. Structures

2. Effective Farming to Improve Freshwater Quality

This **2-day** training will benefit any professionals involved in farming or water quality projects, such as science, freshwater planning, consents, compliance and farm advisory/field staff.

The main purpose of this training is to enable the understanding of the science of farming, water quality and mitigation measures and relevant NES and NPS-FM regulations. There is opportunity to build-up extensive technical knowledge in nitrogen and phosphorus management and carbon-zero 2050 impacts on farms.

The well-researched and up-to-date 2025 training manual with 160-pages and more than 150 references will be an additional learning opportunity.

2-Day Key topics:

- Consents and compliance
- Science of soil phosphorus and phosphorus fertiliser application
- Science of soil nitrogen and crop N requirements
- Impacts of N and P in water
- Science of livestock productivity and mitigation measures
- Nitrate leaching and land uses
- Understanding Overseer
- Preparing for zero-carbon 2050
- Freshwater farm plan concept without regulations
- Full table content from Page 8

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1. Why is the topic critical?
2. The contribution of farming to economy and freshwater quality in farmed catchments in NZ
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4. Cultural considerations
    a. Statutory acknowledgments
    b. Te mana o te Wai
    c. Mātauranga Māori
    d. Te ao Māori
5. NPS-Freshwater Management 2020
    a. Complex process of giving effect to NPS-FM
    b. Nutrient Management
6. Stock exclusion regulations 2020
7. RMA planning basics for farming
    a. Water allocation
    b. Minimum flows and aquifer level restrictions
    c. Land use and discharge – nutrient management
        - Land use
        - Discharge
        - Milestone case study on land use and discharge rules
8. RMA consents basics for farming
9. RMA compliance basics for farming
10. Hydrology basics
    a. Groundwater
    b. Groundwater and surface water interactions
    c. Surface water
11. Microbes in the environment
    a. Types of microbes
    b. Microbes in the environment (soil, river lakes and wastewater)
12. Soil chemistry
    a. Soil charges
    b. Buffer capacity
    c. Liming
    d. Soil nutrients
    e. Salinity
13. Water chemistry
    a. Nutrients and chemical status
    b. Redox conditions in groundwater
14. Soil biology including earthworm activity
    a. Soil carbon and microbial activity
    b. Earthworms
15. Understand N and P forms clearly
    a. Nitrogen basics
    b. The N species you must know
    c. P basics
    d. P form and availability in soil and water
16. Phosphorus in soil
    a. How and which forms of P are held in soil?
    b. Significance of Olsen-P in NZ
        - How is Olsen-P measured and reported?
        - Olsen-P thresholds for pasture production
    c. Factors affecting soil-P availability and pasture uptake

        - Key soil factor
        - Plant factors are ill-studied but critical
        - Fertiliser types
        - P-assimilation by microbes (or immobilisation)
        - P-mineralisation or P release from microbes
    d. P losses from soils
    e. Should we continue with Olsen-P as plant available-P indicator?
17. Nitrogen (N) in soil, water and wastewater
    a. Organic-N processes in soil, wastewater and water
    b. N assimilation or immobilisation by microbes
    c. How is nitrate formed in soil, water and wastewater?
    d. Why is nitrate decomposition (denitrification) important?
    e. How is N fixed biologically in soil and water?
    f. Does ammonia volatilisation matter?
    g. Can we continue to ignore atmospheric N deposition?
    h. Nitrate leaching
        - Controlling soil water drainage
        - Controlling N sources
    i. Plant uptake of N
        - Ammoniacal-N
        - Nitrate-N
    j. Do we know enough about algal blooms?
        - Cyanobacteria
        - N:P ratio and water quality
    k. Summary N processes
18. Impacts of non-nutrient farm contaminants on soil and water and water quality limits
    a. Biological oxygen demand (BOD)
    b. Suspended solids
    c. Faecal bacteria
    d. Heavy metals
19. Irrigation and water use
20. Sustainable farm effluent management
    a. Using farm effluent as a nutrient source
        - Farm dairy effluent (FDE)
        - Piggery effluent
    b. The science of farm dairy effluent treatment ponds
21. Understanding livestock productivity
    a. Breeding potentials and rearing
    b. Feed requirements
    c. Fertiliser-nitrogen management
    d. Stocking rate management
    e. Soil management
22. Use of Overseer as a nutrient model
    a. Understanding data and model terminology
    b. Overseer evolution
    c. Overseer coverage of land uses
    d. How does it work?
    e. Constraints
    f. How are nutrient losses calculated?
    g. Data management
    h. Overseer version 6.3.0 data outputs for a trial farm
    i. Overseer version 6.3.0 nitrate leaching and P runoff sensitivity assessment
    j. Overseer data output uncertainty assessment

   k. N leaching assessments derived from models have limited use in scientific research
   l. How to reduce input and output error in Overseer?
23. Is N leaching different in different land uses?
   a. Dairy
   b. Sheep
   c. Cropping
   d. Market gardening
   e. Fruit growing
   f. Viticulture
   g. Land use effect on soil and water quality
24. Science and effectiveness of N mitigation measures
   a. Wetlands
      - Natural wetlands
      - Constructed wetlands
      - Floating wetlands
   b. Riparian margins
   c. Organic farming
   d. Regenerative agriculture
   e. Farm effluent storage and low-rate deferred irrigation
   f. Winter housing and feeding on pads (or restricted grazing)
   g. Denitrification walls and woodchip beds
   h. Nitrification inhibitor DCD
   i. Feed manipulation to reduce urine-N output
   j. Ranking N mitigation options
25. Identifying and manging N hotspots
26. Understanding crop nutrient requirements
27. Understanding and preparing for zero-carbon 2050
   a. Greenhouse gases and effects
   b. Our emissions
   c. Our international obligations
   d. Our response
   e. Understanding farm GHG emissions and the IPCC requirements
   f. Forestry as mitigation
28. Freshwater Farm Plan concept without regulations
   a. General information
   b. Mapping
   c. Risk assessment
   d. Nutrients
   e. Farm effluent
   f. Land and soil
   g. Water and irrigation
   h. Pesticides
   i. Waterway structures
   j. Wastes and wastewater

References

3. Nitrogen in the Environment (Advanced) for Science/Technical Professionals- 3-day

This can be training or knowledge sharing in the context of high-quality science. The module has been developed for technical or scientific and regulatory professionals to enable extensive and in-depth knowledge in nitrogen in air, water, soil and wastewater.

All degree holders including post-graduates will benefit this workshop owing to nitrogen in the environment is being an extensive and diverse technical field. The module is very advanced involving understanding of the microbiological processes, some of which are not even accessible at the academic level.

The training will enable critical assessment of reports/refereed scientific papers on nitrogen and high-quality environmental data/information assessment and reporting. The training manual is >200 pages with nearly

3-Day Learning:

- nitrogen at atom level including stable isotope ^{15}N and all N species
- the secrets of the microbiological processes
- ecosystem metabolism
- mineralisation-immobilisation dynamics
- key driving force behind ammonia volatilisation
- N leaching and attenuation
- Biological N fixation by rhizobium and cyanobacteria
- Denitrification – step by step microbiological understanding
- Critical review of refereed publications
- Wastewater-N processes
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2. Resource Management Act
3. NPS for Freshwater Management 2020
    a. Complex processes of giving effect to the NPS-FM
    b. Nutrient management
4. Stock exclusions regulations 2020
5. RMA water plans basics
    a. Water allocations
    b. Minimum flows/aquifer restrictions
    c. Land use and discharges- nutrient management
6. RMA consents basics
7. RMA compliance basics
8. Cultural considerations
    a. Statutory acknowledgments
    b. Te mana o te Wai
    c. Mātauranga Māori
9. Nitrogen basics
10. Hydrology- basics
    a. Groundwater
    b. Surface water
    c. Groundwater and surface water interactions
11. Microbiology basics
    a. Types of microbes
    b. Why is microbial energy important in the context of N processes?
    c. Microbial energy generation processes
    d. Why are sources of microbial carbon and energy important?
    e. Microbial enzymes kinetics
    f. Molecular biology
    g. Bacterial identification and enumeration
12. Soil, water and wastewater are differing microbial habitats
    a. Soil
    b. Freshwater
    c. Marine water
    d. Wastewater
13. The mystery of N assimilation or immobilisation
    a. Ammonium and nitrate assimilation
    b. Soil
    c. Water
    d. Wastewater
    e. Critical role soil-N immobilisation studies?
14. Organic nitrogen mineralisation (ammonification)
    a. Wastewater digestion is assimilation-mineralisation process
    b. Mineralisation in soils
    c. Nitrogen mineralisation in the aquatic ecosystems
15. Nitrification
    a. Nitrification microbes
    b. Nitrification enzymic processes

   c. Nitrification by archaea
   d. Nitrification by heterotrophs and fungi
   e. Comammox
   f. Nitrification in soils
   g. Nitrification in water
   h. Why is nitrification challenging for wastewater engineers?
16. Why does nitrate decompose?
   a. Bacterial denitrification process
   b. Denitrification in soil
   c. Do we know enough about N attenuation in freshwater?
   d. Marine water denitrification
   e. Non-conventional denitrifications and benefits
17. Biological N fixation is a critical process in soil and water
   a. What is unique about the N fixing enzyme nitrogenase?
   b. Biological N fixation in soils
   c. Biological N fixation in water
18. Is soil ammonia volatilisation process well understood?
19. Is N deposition critical in catchment N studies?
20. Nitrate leaching is a significant RMA issue
   a. Charges in soil
   b. Role of soil water
   c. Sources of NO_3^- leaching
   d. Limitations of leaching field studies and estimates
21. Is plant uptake of N straight forward?
   a. Ammonium uptake
   b. Nitrate uptake
   c. Dissolved organic N (DON) uptake
   d. N use efficiency
22. Environmental impacts of poor N management
   a. Impacts of gaseous N
   b. Impacts of organic-N
   c. Impacts of ammoniacal-N
   d. Impacts of nitrate
23. Understanding the effects of nitrate on human and animal health
   a. Methaemoglobinaemia
   b. Colorectal cancer
   c. Nitrate poisoning in livestock
24. Phosphorus in the environment
   a. Soil phosphorus
   b. Factors affecting soil-P availability and pasture uptake
   c. P fertilisers
   d. P assimilation and mineralisation in soil
   e. P losses in soils
   f. Should we continue with Olsen-P?
   g. Water phosphorus
   h. Wastewater phosphorus
25. Why is understanding C:N:P ratio critical?
   a. Soil
   b. Water
   c. Wastewater

26. Do we know enough about algal blooms?
    a. Surface water
    b. Marine water
    c. Is chlorophyll *a* sufficient to manage algal blooms?
    d. Should we consider cyanobacteria more seriously?
27. Role of earthworms in soil N cycle
28. Science of farm effluent
    a. Using farm effluent as nutrient source
    b. How do the treatment ponds work?
29. Understanding farm management on dairy farms
    a. Breed potential
    b. Feed requirements
    c. Irrigation management
    d. Fertiliser management
    e. Stocking rate management
    f. Soil management
30. Land use impacts on nitrate leaching
    a. Limited role of nutrient models in scientific research
    b. Dairy
    c. Sheep
    d. Beef
    e. Cropping
    f. Market gardening
    g. Fruit growing
    h. Viticulture
    i. Land use impacts on water and soil
31. Science and effectiveness of N mitigation measures
    a. Principles of nutrient mitigation measures
    b. Riparian margins
    c. Farm dairy effluent storage and deferred irrigation
    d. Winter housing or restricting grazing
    e. Nitrification inhibitor -DCD
    f. Organic farming
    g. Regenerative farming
    h. Feed manipulation
    i. Wetlands (natural, constructed and floating)
    j. Denitrification wall and woodchip beds
    k. Nitrate leaching mitigation strategies
32. Polluted lakes/reservoirs/ponds restoration
    a. Principles of lake water quality deterioration and restoration
    b. Nutrient containment and cycling
        i. Aeration
        ii. Use of algaecides/weedicides
        iii. Submerged barley strawbales
        iv. Ultrasonic treatment
        v. Nutrient inactivation
        vi. Biological manipulation
        vii. Shading
        viii. Water augmentation
    c. Nutrient avoidance and removal

33. Is ^{15}N stable isotope a reliable tool in tracking sources of N pollution?
34. Understanding Overseer nutrient model
    a. Understanding data and model terminologies
    b. Overseer evolution
    c. Overseer coverage and land uses
    d. How does it work?
    e. Constraints
    f. How are nutrient losses calculated?
    g. Data management
    h. Overseer outputs assessment
    i. Overseer N leaching and P-runoff sensitivity assessment
    j. Overseer data output uncertainty assessment
    k. How to reduce input and output error in Overseer?
35. Industrial and sewage wastewater N treatment
    a. Basic wastewater treatment principles
    b. Treatment systems to treat nitrogen
36. Using land treatment to treat nitrogen effectively
    a. Basic wastewater treatment principles
    b. How does it work?
    c. Determining wastewater-N loading rate
    d. Managing other factors
37. Understanding and preparing for zero-carbon 2050
    a. Greenhouse gases and effects
    b. Atmospheric chemistry of nitrogen
    c. Our international obligations
38. NPS-FM 2020 attributes assessment
    a. Toxicity
    b. Trophic state
    c. Ecosystem metabolism
39. Our freshwater nitrogen status and actions
    a. Freshwater N status
    b. Actions
40. Are research and N monitoring on the right track?
    a. Quality of N research and monitoring
    b. Soil research
    c. Water research
    d. Wastewater research
    e. Is the regional council N monitoring sufficient?
    f. Should councils be involved in research?
41. Quality of reporting
    a. How can we improve the regional and national SOE reporting?
    b. Research reporting
    c. How to review papers from refereed journals critically?

References

Glossary

4. Effective Regional Council RMA Consents Process

This **2-day** extensive training promotes quality consent process and enables learning of the technical and legal assessment of the activities requiring consents under s12, 13, 14 and 15 of the RMA. It promotes receiving quality applications under s88 thereby avoiding costly and lengthy consent process.

It suits even experienced consent professionals since there is considerable amount of technical/scientific information (e.g., discharges to water including mixing zones, land treatment of wastewater and boiler air discharges). There is also focus on NPSs and regulations. Comprehensive manual is 162 pages.

2-Day key topics:

- Consent process from application lodging to decisions/conditions
- Difference between efficient and effective consent process
- Detailed technical and legal assessment of the activities under s12, 13, 14 and 15 of the RMA
- Water take and use efficiency
- Science/legal stumbling blocks of the impacts of discharges to land, water (including mixing zones) and air
- Processes such as reviews, retrospective consents etc.
- Plantation forestry NES
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3. Cultural considerations
    a. Discharges to water
    b. Statutory acknowledgements
    c. Te Mana o te Wai
    d. Mātauranga Māori and Te ao Māori
4. NPS-Freshwater Management 2020
5. ENVIROKNOWLEDGE® techniques for efficient and legally defensible consent process
    a. Solutions for efficient consent process
        i. Application forms
        ii. Poorly drafted legislation, policies and plans
        iii. Receive or reject?
        iv. Value of the pre-application work
        v. Other application options
        vi. Publicly notify or non-notify?
        vii. Role of limited notification
        viii. Poor systems or supporting services
        ix. Delegations
        x. Technical input/assistance
        xi. Customer enquiries management
        xii. S92 use
        xiii. Hearings
        xiv. Decisions
        xv. Conditions
        xvi. Drafting good consent conditions
        xvii. RMA timeframes
        xviii. Notification of decision
        xix. Change (s127) vs new consents
        xx. Deemed permitted activity under s88BB
        xxi. Consultancy/contractor management
    b. Environment Court appeals
    c. Legally defensible consents
    d. Cost effective consent process
3. Other consent process matters
    a. Joint hearings by two or more consent authorities
    b. Consents commencements
    c. Renewals under s124
    d. Lapses under s125
    e. Cancellations under s126
    f. Change or cancellation of consent condition under s127
    g. Conducting consent reviews under s128
    h. Retrospective consents
    i. Certificate of compliance
    j. Consents for emergency works under s330
4. Effective consent process
    a. Environmental outcomes

b. Proactive process
c. Short-term consents
d. Contentious applications
e. Managing conflicts

5. Coastal permits
    a. Legal considerations
        i. Restricted coastal activities
        ii. Aquaculture
        iii. Coastal discharges
        iv. Coastal structures, reclamations and bed disturbances
    b. Technical considerations
        i. Aquaculture
        ii. Coastal structure
        iii. Dredging and dredging discharges
        iv. Discharges
6. Bed disturbances and structures
    a. Legal considerations
    b. Technical considerations
        i. Gravel extractions
        ii. Structures
7. Water takes and uses
    a. Legal considerations and interpretations
        i. Water use information
        ii. Mining privileges
        iii. Water allocation, storage, minimum flows and groundwater level restrictions
    b. Technical considerations
8. Damming/diversions
    a. Legal considerations
    b. Technical considerations
9. Discharges to surface water
    a. Legal considerations
        i. Discharge of water to water
        ii. Discharge of contaminants to water
    b. Technical considerations
        i. Discharge of water to water
        ii. Discharge of contaminants to water
            1. Contaminants in discharges, limits and contaminants behaviour in surface water
            2. Sewage
            3. Industrial
            4. Farm
10. Dealing with mixing zones
11. Discharges to land
    a. Legal considerations
    b. Technical considerations
        i. Land treatment
            1. Sewage and industrial
            2. Farm dairy effluent
            3. Piggery effluent
        ii. Land disposal

12. Discharges to air
    a. Legal considerations
    b. Technical considerations
        i. Boilers
        ii. Odour from industrial sites
13. Earthworks
    a. Legal considerations
    b. Technical considerations
14. Contaminated sites
    a. Legal considerations
    b. Technical considerations
15. Nitrogen leaching limit for farming activity
    a. Legal considerations
    b. Technical considerations
16. Water take transfers
17. NESs for commercial forestry 2023
18. Stock exclusions regulations 2020
19. NESs for marine aquaculture 2020

5. Effective Regional Council Compliance Monitoring and Enforcement

Most compliance professionals receive enforcement training which is only a fraction of the duties of any consents monitoring professionals. There is little or no training provided on monitoring consent conditions efficiently and effectively. This **2-day** training fills the above gap successfully.

The training promotes critical assessment of consent conditions for monitoring, consent impact assessment and ongoing improvement of environmentally effective and cost-effective consent conditions. Full legal and scientific assessment of consents monitoring under s9, 12, 13, 14 and 15 is provided. Comprehensive manual is >140 pages.

2-day learning:

- Efficient versus effective consents monitoring
- Legal and technical assessment of consents monitoring under s12, 13, 14 and 15 of the RMA
- Water quality and quantity (technical)
- Basics of widely used wastewater treatment systems including land treatment
- Enforcement
- Consents lapses, cancellations and reviews
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    a. Staff management
    b. Compliance and consents monitoring strategy
    c. Consents monitoring procedures
    d. Enforcement strategy
    e. Enforcement procedures
    f. Compliance database
    g. Delegations
    h. Technical inputs/assistance
    i. Complaints/incidents management
    j. Timely consents monitoring
    k. Poor permitted activity rules
    l. Poor consents conditions
    m. Management plans as consent conditions
    n. Consents reviews
    o. Legally defensible consents monitoring
    p. Cost effective consents monitoring
4. REQUIRING RETROSPECTIVE CONSENTS
5. CONSENTS COMMENCEMENTS
6. EMERGENCY WORK CONSENTS UNDER S330
7. CONSENTS LAPSES, CANCELLATIONS
    a. Lapses under s125
    b. Cancellations under s126
8. CONSENTS CHANGES UNDER s127
9. CONSENTS RENEWALS AND COMPLIANCE
10. CONSENTS SURRENDERS
11. CERTIFICATE OF COMPLIANCE
12. CONSENTS REVIEWS UNDER s128
13. POWER OF ENTRY FOR INSPECTION AND SURVEY
14. ENFORCEMENT
    a. How to identify offences correctly under the Act?
    b. Enforcement process
    c. Warnings and infringement notices
    d. Role of abatement notices
    e. Role of enforcement orders
    f. Understanding interim enforcement order
    g. Prosecutions
    h. Penalties under the RMA
    i. Can diversion be used as an enforcement tool?
15. EFFECTIVE COMPLIANCE MONITORING
    a. Consents conditions are not adequate
    b. Monitoring conditions
    c. Changing circumstances

d. Limits/standards not sufficient
e. Unidentified adverse effects

16. HYDROLOGY- BASICS
17. CONTAMINANTS BEHAVIOUR
    a. Nitrogen
    b. Phosphorus
    c. Biological oxygen demand (BOD)
    d. Suspended solids
    e. Faecal bacteria
    f. Heavy metals and hazardous substances
    g. Emerging and endocrine disrupting compounds
18. EFFICIENT, LEGALLY SOUND AND ENVIRONMENTALLY EFFECTIVE CONSENTS AND COMPLIANCE MONITORING
    a. DISCHARGES TO SURFACE WATER
        i. Legal considerations
        ii. Technical considerations
            1. Discharge of water to water
            2. Discharge of contaminants to water
                a. Contaminants in discharges, limits and contaminants behaviour in surface water
                b. Sewage
                c. Industrial
                d. Stormwater and sediments
                e. Farm
    b. DISCHARGES TO LAND
        i. Legal considerations
        ii. Technical considerations
            1. Land disposal of wastewater
            2. Land treatment
            3. Landfills
    c. DISCHARGES TO AIR
        i. Legal considerations
        ii. Technical considerations
            1. Boilers
            2. Odour from industrial sites
    d. RIVERBED DISTURBANCES AND STRUCTURES
        i. Legal considerations
        ii. Technical considerations
            1. Gravel extractions
            2. Structures
    e. WATER TAKES AND USES
        i. Legal considerations and interpretations
        ii. Water use information
        iii. Water allocation, storage, minimum flows, groundwater level restrictions and water shortage directions
        iv. Technical
    f. DAMMING/DIVERSIONS
        i. Legal considerations
        ii. Technical considerations
    g. COASTAL

i. Legislative considerations
    1. Aquaculture
    2. Coastal discharges
    3. Coastal structures, reclamations and bed disturbances
ii. Technical considerations
    1. Aquaculture
    2. Coastal structure
    3. Dredging and dredging discharges

h. EARTHWORKS
    i. Legal considerations
    ii. Technical considerations
i. NITROGEN LEACHING LIMIT FOR FARMING ACTIVITY
    i. Legal considerations
    ii. Technical considerations

19. WASTEWATER TREATMENT SYSTEMS AND WASTEWATER DISCHARGES
20. WATER TAKE TRANSFERS
21. NPS FRESHWATER MANAGEMENT
22. NESs FOR ASSESSING AND MANAGING CONTAMINANTS IN SOIL TO PROTECT HUMAN HEALTH 2011
    a. Legal considerations
    b. Technical considerations
23. NESs FOR COMMERCIAL FORESTRY 2017
    a. Afforestation
    b. Earthworks
    c. River crossings
    d. Forestry quarrying
    e. Harvesting
    f. Mechanical land preparation
    g. Replanting
    h. Ancillary activities
    i. General provisions
24. NESs FOR STORING TYRES
25. CULTURAL CONSIDERATIONS
    a. Statutory acknowledgments
    b. Te mana o te Wai
    c. Te Ao Māori and mātauranga Māori

How to Access ENVIROKNOWLEDGE® Training?

Host your own training

- Arrange your own workshop at your own venue by contacting at sustain@environknowledge.co.nz
- Minimum number of attendees: 5
- Maximum number of attendees: 15
- Discount per attendees[1]: 5% up to 5, 10% for 6-9 and 15% ≥10
- Fee per person (excluding GST) $1475.00 (Nitrogen 3-day $1575)
- Number of days needed per training: 2-days (8 hours/day) (Nitrogen 3-days)
- Optional extended training for 3-days will be available for similar fee for those who prefer detailed/slow-paced training
- Venue, data-projector screen, whiteboard, tea/coffee provided by the host organisation
- Training is by PowerPoint/Whiteboard presentation with active discussion
- Comprehensive colour training manual and certificate provided
- No assignments or tests

[1] Discount applies to attendees from the host organisation and from other host invited organisations

Training hosted by ENVIROKNOWLEDGE® at selected venues- Hamilton, Wellington, Christchurch and Dunedin:

- Flyers sent by emails and posted at www.enviroknowledge.co.nz notifying training venues and dates
- Maximum number of attendees/training: 15
- Fee per person (excluding GST): $1475.00 (Nitrogen 3-day $1575)
- Discount per attendees[1]: 5% for 3-5 and 10% for ≥6
- Lunch/tea/coffee provided on both days
- Comprehensive colour training manual and certificate provided
- No assignment or tests

[1] Discount applies to the attendees from the same organisation

Other ENVIROKNOWLEDGE® Services

ENVIROKNOWLEDGE® excels in technically complex projects and high-quality outputs.

- As Hearing Commissioner consent hearing and decisions on:
  - wastewater discharges to land and water
  - land use for catchment water quality management
  - Lake/river water quality restoration
  - Water takes and uses
  - Farm nutrient management
  - Soil contamination
  - Biosolids and biosolids applications to land

- Consent process of technically complex consent applications on
  - Wastewater discharges to land water
  - Water takes and use
  - Land use changes impacting catchment water quality
  - Soil contamination or contamination restoration
  - Biosolids application to land

- Consent compliance review and assessment of environmental effects of consent conditions and breaches on
  - Discharges to land and water
  - Water takes and use
  - Land use and catchment water quality
  - Soil contamination restoration
  - Biosolids application to land

- RMA Regional Policies/Plans reviews and changes
  - Water & land
  - Coastal
  - Air plan

- High quality report reviews of scientifically/technically complex reports on
  - State of the environment
  - Wastewater treatment, quality and discharge, catchment water quality
  - Water quality restoration
  - Land use changes affecting catchment water quality
  - Biosolids and biosolid application to land
  - Consent application AEEs

- Expert witness in
  - Groundwater and surface water quality
  - Soil quality/contamination
  - Wastewater quality, treatment and discharges

Mini-CV Dr Selva Selvarajah

Qualifications

PhD Soil Science (Lincoln University), BScAg (Hons- soil microbiology) (University of Peradeniya, Sri Lanka)

Specialising in: Soil, water and wastewater chemistry/microbiology, wastewater treatment, soil and water and air pollution, catchment water quality, RMA consent process, reviews, hearing and decisions, RMA compliance, planning and consent monitoring and scientific report writing and reviews.

Experience

- Regional council work as scientist, 3rd tier manager and 2nd tier manager- 21 years
- Senior Executive Management (Regional Council)– 13 years
- RMA consent process- 32 years
- RMA planning – 8 years
- RMA compliance– 32 years
- Scientific reports/publications/presentations – 40 years (First Prize -best paper and oral presentation at the NZ Soil Science Society and NZ Institute of Agricultural and Horticultural Sciences Convention 1992, >100 reports/publications/articles, 6 national and international keynote presentations)
- Training – 10 years (trained >450 regional/city/district council, consultancy and CRI professionals)

Certificates

- Advanced Sustainable Nutrient Management Massey University 2017
- Making Good Decisions Ministry for the Environment – Hearings Chair endorsement

Key ENVIROKNOWLEDGE® projects

- Environment Southland – Full consent application process of subsurface irrigation of treated Te Anau sewage wastewater including s42A reporting
- Bendemeer Estate, Queenstown – cyanobacteria infested water quality restoration and water quality self-management plan -58 pages
- Gisborne District Council – Mortuary wastewater land treatment -61 pages
- Gisborne District Council – Biological trickling filter solids reuse options -74 pages
- Greater Wellington Regional Council – land discharge consent breaches adverse effects assessment – 22 pages
- Ashburton District Council- Review of the performance of the WWTPs – 53 pages
- West Coast Regional Council- Acting Regulatory Manager (2024) and at present Technical Advisor- Regulatory and Policy
- Expert witness– Waikato, Otago, Northland and West Coast Regional Councils

Example papers:

Selvarajah, S. 2022. Is New Zealand drinking water nitrate-nitrogen standard fit for purpose to protect from colorectal cancer? A critical review. https://www.researchgate.net/publication/358864025_IS_NEW_ZEALAND_DRINKING_WATER_NITRATE_STANDARD_FIT_FOR_PURPOSE_TO_PROTECT_FROM_COLORECTAL_CANCER_A_CRITICAL_REVIEW

Selvarajah, S. 2021. Using plant nitrogen removal to determine cut & carry wastewater land treatment nitrogen loading rate and to minimise nitrogen leaching. Land Treatment Collective Annual Conference. https://www.researchgate.net/publication/352297539_REGULATING_PLANT-NITROGEN_REMOVAL_IN_SEWAGE_AND_INDUSTRIAL_WASTEWATER_CUT_CARRY_LAND_TREATMENT_SYSTEMS_TO_MINIMISE_NITROGEN_LEACHING

Selvarajah, S. 2011. Consent process to effect changes in wastewater discharges - A review of the past decade of consent process of key wastewater discharges in the Otago Region. Water New Zealand, November 2011 issue. https://www.researchgate.net/publication/269338417_Consent_Process_to_Effect_Changes_in_Wastewater_Discharges_-_A_Review_of_the_Past_Decade_of_Consent_Process_of_Key_Wastewater_Discharges_in_the_Otago_Region