Title	**Demonstrate knowledge of and operate sludge treatment systems for effluent water in an energy and chemical plant**		
Level	**4**	**Credits**	**8**

Purpose	This unit standard is intended for people working as boiler operators and energy and chemical process operators in an energy and chemical plant. People credited with this unit standard are able to: demonstrate knowledge of sludge resulting from effluent treatment in the energy and chemical industry; and the system, equipment and processes used in the treatment of sludge in an energy and chemical plant. They are also able to: operate sludge treatment equipment and associated processes; and take and analyse samples, interpret and document sludge treatment system data, and carry out required actions in an energy and chemical plant.

Classification	Energy and Chemical Plant > Operation of Energy and Chemical Plant

Available grade	Achieved

Guidance Information

1 Legislation relevant to this unit standard includes but is not limited to:
- Health and Safety at Work Act 2015;
- Hazardous Substances and New Organisms Act 1996;
- Resource Management Act 1991;

and any subsequent amendments.

2 Definitions

Energy and chemical plant may be in – petrochemical, agri-nutrient, power generation, dairy processing, meat processing, and wood fibre manufacturing, or other plants that operate with a combination of high temperatures, pressures, steam and/or chemicals in gas, liquid or solid form.

Organisational requirements – documented policies and procedures. These may include: equipment manufacturers' procedures; plant procedures; suppliers' instructions; site signage; codes of practice; company health and safety plans; on site briefings; and supervisor's instructions. This includes all regulatory and legislative obligations that apply to the plant.

Plant – the operational unit, equipment and/or workplace at which the person is working

3 For the purposes of assessment:

- evidence for the practical components of this unit standard must be supplied from the workplace.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of sludge resulting from effluent treatment in the energy and chemical industry.

Performance criteria

1.1 Identify sludge resulting from effluent treatment in terms of type.

Range evidence of two types is required.

1.2 Describe potential contaminants of sludge in terms of their effect on discharge requirements.

Range evidence of two types of contaminants is required.

1.3 Describe the chemicals used for sludge treatment process systems in terms of their impact.

Outcome 2

Demonstrate knowledge of the system, equipment and processes used in the treatment of sludge in an energy and chemical plant.

Performance criteria

2.1 Describe the sludge digestion system in terms of design and operating concepts.

2.2 Describe the sludge conditioning system in terms of design and operating concepts.

2.3 Describe the sludge filtration system in terms of design and operating concepts.

2.4 Describe the sludge treatment process system in terms of design and operating concepts of equipment items.

2.5 Describe the sludge disposal system in terms of design and operating concepts.

2.6 Describe required sludge quality in terms of discharge consents and legislative requirements.

Outcome 3

Operate sludge treatment equipment and associated processes in an energy and chemical plant.

Performance criteria

3.1 Identify the location of sludge treatment equipment in accordance with the site-specific identification coding system and organisational requirements.

3.2 Operate sludge treatment equipment using safe work practices in accordance with organisational requirements.

3.3 Carry out checks and routine procedures in accordance with organisational requirements.

3.4 Identify plant disruptions and take corrective actions in accordance with organisational requirements.

Range plant disruptions may include but are not limited to – process deviations, equipment malfunctions;
evidence of three different types of plant disruptions is required.

3.5 Complete all plant documentation related to the process and equipment operation in accordance with organisational requirements.

Outcome 4

Take and analyse samples, interpret and document sludge treatment system data, and carry out required actions in an energy and chemical plant.

Range evidence of two sludge treatment data sets is required.

Performance criteria

4.1 Take and analyse samples in accordance with organisational requirements.

4.2 Document sludge treatment system data in accordance with organisational requirements.

4.3 Interpret effluent water quality data to identify deviations from operating standards in accordance with organisational requirements.

4.4 Take and record required actions in accordance with organisational requirements.

Planned review date	31 December 2024

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	25 November 2000	31 December 2014
Revision	2	24 July 2002	31 December 2014
Review	3	27 June 2005	31 December 2014
Rollover and Revision	4	25 July 2006	31 December 2014
Review	5	22 May 2009	31 December 2016
Review	6	24 October 2014	31 December 2022
Review	7	27 February 2020	N/A

Consent and Moderation Requirements (CMR) reference	0079

This CMR can be accessed at http://www.nzqa.govt.nz/framework/search/index.do.

Comments on this unit standard

Please contact the Primary Industry Training Organisation standards@primaryito.ac.nz if you wish to suggest changes to the content of this unit standard.