DOCUMENT AMENDMENT RECORD SHEET (Revision History)

No	Date of Change	Description	Page	Revision	Approved By
1	27 June 2018	New Release	1-7	00	CEO

1.0 General

All chemicals (Hydrated Lime) shall be of a grade suitable for the treatment of drinking water and shall contain no soluble minerals or organic substances capable of producing deleterious or injurious effects on public health.

The Hydrated Lime shall be in accordance to MS 1836:2005; Hydrated Lime and Slurry Lime for use in portable water supply – specification.

2.0 Scope

The specification for Water Treatment Chemical – Hydrated Lime is a guideline for the Hydrated Lime suppliers to comply — in order to supply the Hydrated Lime for PBAPP's use in potable water supply service.

3.0 SPAN Requirements

All suppliers of the chemical must be registered in the Suruhanjaya Perkhidmatan Air Negara (SPAN) Listing / Registration of Suppliers, and the registration must be valid during period of supplying of the chemical.

4.0 Safety & Health Requirements

4.1 All suppliers shall fully comply with the clauses / requirements in:

a) Occupational Safety and Health Act , 1994,

b) Occupational Safety and Health (Classification, Labelling and Safety Data Sheet of Hazardous Chemicals) Regulations 2013,

c) Industry Code of Practice on Chemicals Classification and Hazard Communication 2014 (ICOP 2014),

d) Any Regulations / Orders; and

e) As well as other applicable laws

5.0 Halal Certificates Requirements

All chemicals (Hydrated Lime) shall have valid HALAL certificate.

6.0 Chemical Requirement

6.1 Purity Criteria

6.1.1 Hydrated Lime shall not contain any impurities and additives in such concentrations that are capable of producing deleterious or injurious effects on the health of those consuming water that has been properly treated with the lime.

6.1.2 The Hydrated Lime must comply with the requirements as specified in Table 1.

Parameter	PBAPP Specifications	Test Method
Available Calcium Hydroxide ($CaOH_2$) (dry basis) , % (w/w)	94% minimum	EN 12485 or MS 850
Available Calcium Oxide (CaO) (dry basis) , % (w/w)	69.7% minimum	EN 12485 or MS 850
Water Content , % (w/w)	2.0% maximum	EN 12485 or MS 850
Insoluble matters (dry basis) , % (w/w)	8.0% maximum	EN 12485 or MS 850
Calcium Carbonate ($CaCO_3$),(dry basis), %(w/w)	7.0% maximum	EN 12485 or MS 850
Silicon Dioxide (SiO_2), % w/w of dry product	2.0% maximum	EN 12485 or MS 850
Aluminium Oxide (Al_2O_3), % w/w of dry product	0.5% maximum	EN 12485 or MS 850
Iron Oxide (Fe_2O_3), % w/w of dry product	0.5% maximum	EN 12485 or MS 850
Manganese Dioxide (MnO_2), % w/w of dry product	0.15% maximum	EN 12485 or MS 850
Fineness – Wet sieving (Dry basis)	Minimum 90% pass through 75µm sieve	AS 4489.2.1

Table 1: Requirements for Hydrated Lime

6.2 Toxic Substances

The content of toxic substances in the product must comply with the requirements specified in Table 2.

Parameter	Maximum Limit in mg/kg of dry substance	Test method
Arsenic (As)	5	EN 12485 or EPA 600/4-79-020 40 Method 206.2
Cadmium (Cd)	2	EN 12485 or EPA 600/4-79-020 40 Method 213.2
Chromium (Cr)	20	EN 12485 or EPA 600/4-79-020 40 Method 218.2
Mercury (Hg)	0.3	EN 12485 or EPA 600/4-79-020 40 Method 245.2
Lead (Pb)	25	EN 12485 or EPA 600/4-79-020 40 Method 239.2
Selenium (Se)	4	EN 12485 or EPA 600/4-79-020 40 Method 270.2
Nickel (Ni)	20	EN 12485 or EPA 600/4-79-020 40 Method 272.2
Antimony (Sb)	4	EN 12485 or EPA 600/4-79-020 40 Method 204.2

Table 2 : Content of Toxic Substances

7.0 Marking, Labeling and Packaging

7.1 Marking

7.1.1 The following information shall be marked legibly either on each container (bag / big bag):

a) Chemical solution, trade name and grade
b) Net Weight
c) Name, address and telephone number of supplier and manufacturer
d) Batch number
e) The date of manufacturing; and shall bear such other markings as required by applicable laws
f) The statement 'Potable grade'
g) Expiry date of the chemical

7.1.2 In the case of shipment in bulk, every consignment shall carry a certificate setting out the above-mentioned information.

7.2 Risk and Safety Labeling and Safety Data Sheet (SDS)

7.2.1 Labeling requirements (written in both Bahasa Malaysia and English) shall apply to Hydrated Lime and shall comply with the requirements of the Regulations 6, 7, 8, 9, 10, 11 and 12 of the Occupational Safety and Health (Classification, Labelling and Safety Data Sheet of Hazardous Chemicals) Regulations 2013, Industry Code of Practice on Chemicals Classification and Hazard Communication 2014 (ICOP 2014), Occupational Safety and Health Act 1994 (Act 514) and Regulation and Orders.

7.2.2 Suppliers shall furnish dual languages (English and Bahasa Malaysia) of an up-to-date Safety Data Sheet (SDS) complying with Regulation 13 of the Occupational Safety and Health (Classification, Labeling and Safety Data Sheet of Hazardous Chemicals) Regulations 2013 for each chemical before their first delivery to PBAPP Sdn. Bhd.

7.3 Packaging, Chemical Handling during Transportation, Labeling and Certificate of Analysis

7.3.1 Packaging, Chemical Handling during Transportation and Labeling

7.3.1.1 All suppliers must prepare packaging according to the below Table 3: Requirement of Packaging.

Type of Packing of Hydrated Lime	Packing Description
- Bulk / Silo	Bulk delivery for Silo
- 25kg / Bag	Packed in 25 kg. nett 4 ply craft paper bags with every 40 bags (1 tonne) in wooden pallet.
- 500kg / Bag	Weight per bag : 500kg Big Bag Bag size : 850mm (width) x 850mm (length) x 900mm (height) Bag material : Polypropylene woven white color laminated fabric (used bags to be taken back by supplier or reuse) Lifting sleeve : 4 nos PP lifting sleeves at each corner Top spout : 14'' diameter x 18'' long Bottom spout : 12'' diameter x 18'' long Label : 1) Lot Number 2) Manufacturer Date 3) Expiry Date Only new bags or bags which have been used only for Hydrated Lime will be accepted. Bags that have been used to store any other chemicals will not be accepted at all. The successful supplier is required to collect all the empty bags from the PBAPP's chemical store.

Table 3: Requirement of Packaging

7.3.1.2 The packaging shall be securely sewn at both ends to provide sufficient sealing at ends to prevent leaking and also be with stand rough handling.

7.3.1.3 No contamination of Hydrated Lime by toxic substances or other foreign substances shall occur during transportation.

7.3.1.4 Broken bags, drums, containers, rebadged chemicals or other poor packing conditions shall be rejected and PBAPP reserves the right to reject any good that in their opinion is considered poorly packed.

7.3.1.5 It is mandatory requirement to state the lot number, manufacturer date and expiry date at all packages of shipments.

7.3.1.6 The supplier is required to collect back all the empty used chemical bags from the PBAPP WTP's chemical store for proper disposal according to relevant legal requirements.

7.3.1.7 The supplier shall provide recommendations for appropriate materials of constructions for the storage, handling and packaging of each specific product.

7.3.2 Certificate of Analysis (COA)

7.3.2.1 A certificate of analysis, with the indication of country of origin (where applicable) shall accompany all deliveries for the chemical and to be given to the end users.

7.3.2.2 The contents of the certificate of analysis shall include the following:

a) Available Calcium Hydroxide (dry basis) , % (w/w)
b) Available Calcium Oxide (dry basis) , % (w/w)
c) Passing sieve of 75µm (dry basis) , % (w/w)
d) Water Content , % (w/w)
e) Insoluble matters (dry basis) , % (w/w)

7.3.2.3 The COA shall contain the Batch No., parameter, PBAPP Specification, Actual Results and a column stating comparison of the result against PBAPP specification (Compliance to PBAPP specification). Supplier must provide the COA according to the Sample Format as tabulated in Table 4.

Customer / Location of Chemical Delivered to :
Tanker / Lorry Number :
Delivery Date :
Delivery Order Number :

Name of Chemical :
Batch Number :
Country of Origin :
Manufacturing Date :
Expiry Date :

Parameter	PBAPP Specifications	Actual Result	Compliance
Available Calcium Hydroxide (dry basis), % (w/w)	≥ 94%		
Available Calcium Oxide (dry basis), % (w/w)	≥ 69.7%		
Passing sieve of 75µm (dry basis) , % (w/w)	≥ 90%		
Water Content , % (w/w)	≤ 2%		
Insoluble matters (dry basis) , % (w/w)	≤ 8%		

Table 4 : Sample Format of COA Report

7.3.2.4 A comprehensive certificate of analysis shall be provided to end users upon their request and the parameter as per 6.1 Table 1 and 6.2 Table 2.